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DURBAN, SOUTH AFRICA
"CITIES WE HAVE VS. CITIES WE NEED"
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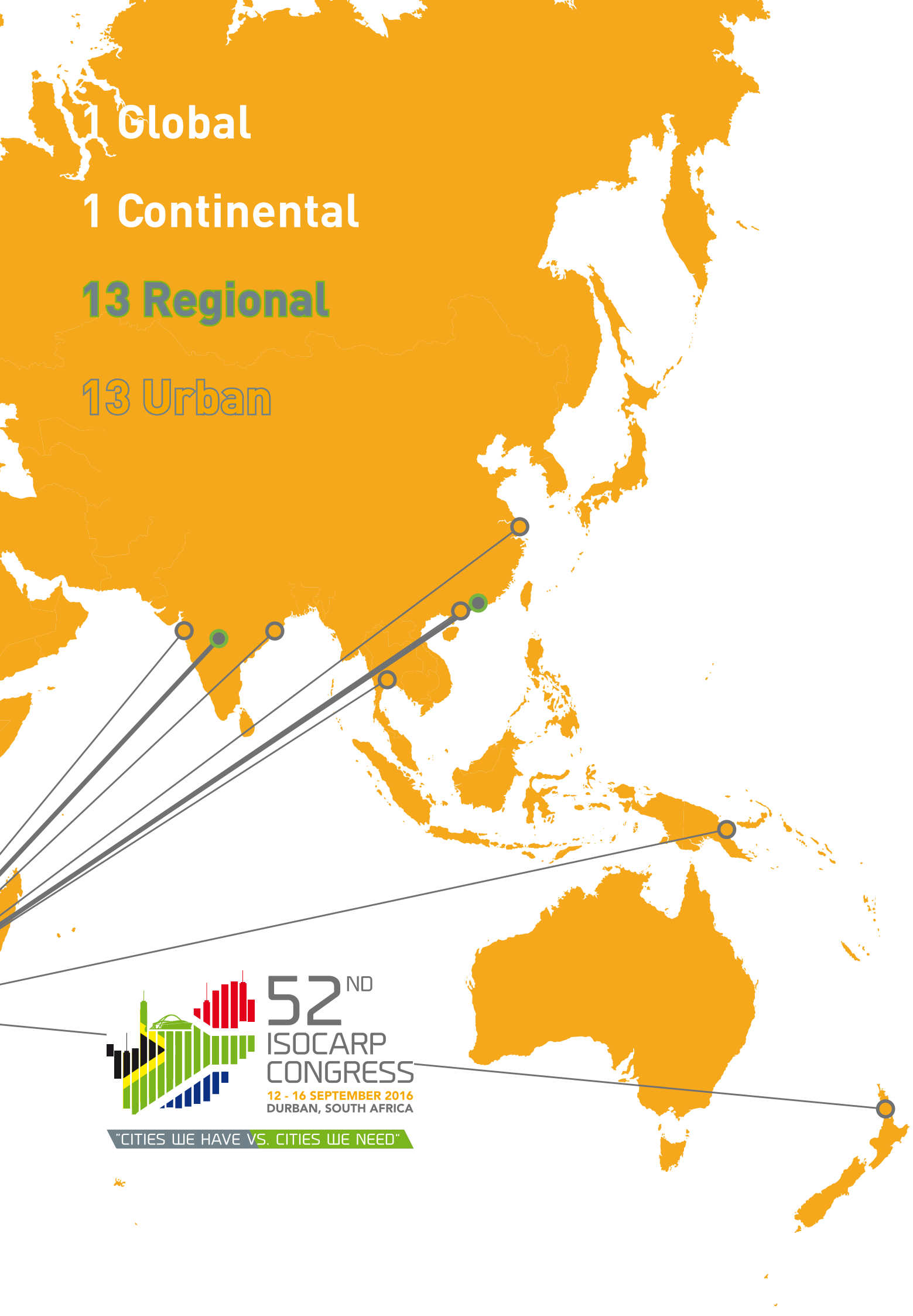
28 Papers



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"CITIES WE HAVE VS. CITIES WE NEED"

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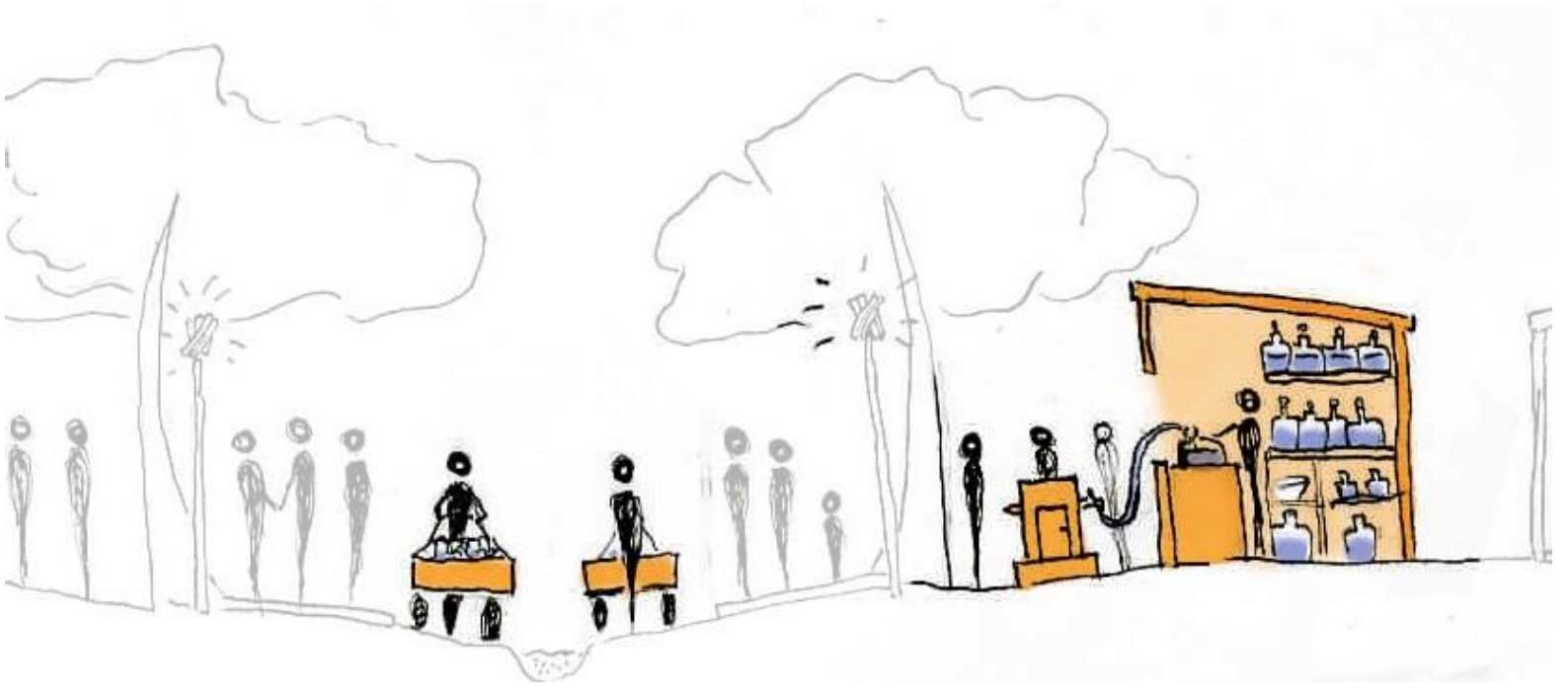
"CITIES WE HAVE VS. CITIES WE NEED"

Track I

Transforming human settlements



Final Report

by Malgorzata Hanzl, Poland; Ahmed Sangaré, Côte d'Ivoire; Peter Robinson, South Africa

THE TRENDS IN THE CITIES WE HAVE

Cities are undergoing constant spatial transformations by the combined effects of complex and dynamic factors such as culture, politics, policy making, economic crises, population influx and outflux, wars, climate change and natural disasters. The papers of Track 1 have shed light on the trends in the evolution and transformations happening in the cities we have, which are prone to undesired consequences.

Informal settlements and negative spaces

Informal settlements are often perceived as negative spaces that fail to attract "desirable" land uses and associated private investment, and have emerged as a result of questionable planning and design, and the incapacity of cities to accommodate all their population in appropriate spaces. These informal settlements are the most visible expression of social exclusion and insecurity that often bleed on the surrounding areas

Urban sprawl and the rapid transformation on the fringes of cities

The number of urban dwellers is growing rapidly along with space use patterns that favour low density population. There is therefore unprecedented constant pressure on the fringes of cities and challenges regarding their articulation with the surrounding rural areas. Mobility has become challenging as well, mainly due to the horizontal extent of cities which have higher and higher carbon footprints worsened by the extensive use of automobile.

Focus on consolidated urban fabric at the expense of rural areas

In terms of social and economic development, cities are one of the main challenges facing the international community. So it's no wonder that many governments and institutions are pinning their development hopes on cities. Unfortunately this is happening at the expense of rural areas that still host a significant part of world population. The resulting urban-rural disparities justify the ongoing rural depopulation with even more pressure on cities.

Exclusive design principles

Ubiquitous spatial barriers exist in our cities, which discriminate against people with impairments and exclude them from involvement and participation in the life of the community. They are not taken into account by widely prevailing design paradigms in the usability assessment of the urban spaces.

Conflicts and migrations

We are living in a world unquiet by miscellaneous turmoils such as war, socio political unrest, terrorism and natural disasters, causing severe destruction in cities and sometimes unfortunately erasing parts of their secular memories. The consecutive mass movements of population in search of safety bring together people with different cultures and perspectives all over the world, resulting in social tensions, the rise of nationalisms and identity crises.

LEVERS TO MANAGE THE CHANGE TOWARDS THE CITIES WE NEED

The speakers have defined the cities we need: amongst other characteristics, they are physically active cities, inclusive cities, cities that are integrated with rural areas, cities that offer rich social experiences, cities that save collective and individual memories, resilient cities, cities that preserve the environment. The discussions have then outlined the levers to manage the transformations of current cities towards the above described much needed cities.

Collaboration

Planners alone cannot deliver ready to use solutions. This reality must be acknowledged. Besides conventional partners like governments, we need to figure out new ways of collaboration with other stakeholders that heavily influence the transformations occurring in cities, such as powerful cash holders in the private sector and the general public.

Universal design principles

We need to remove as much barriers as possible to people with physical impairments. To a wide extent, new design principles must be thought of, taking into account all categories of people (elderly, children, physically disabled) with no need of any adaptation for any category of users. New design principles should also encompass new ways of using public space, including the changing life styles.

Reconsider development paradigm

The cities that serve as examples to the emerging world are most of the time the typical example of things which should not be done. Not every city on the surface of the earth can be like Dubai: that's not a lifestyle suitable for everyone and the resources of our planet just cannot sustain it.

Micro-transforming

Gradually optimising historic urban fabrics or dense informal settlements with small and low-cost actions in a slow and organic way, is a human-oriented approach that is sometimes a better alternative to large scale and cumbersome interventions. The narrowing of the scope of the interventions to the community level allows a deeper involvement of people.

Open-ended experiments and nuanced approach to admitted tools

Planners shouldn't shy away from questioning admitted theories and practices that sometimes have lukewarm results on the ground. Research by design with open-ended experiments is a good way to explore new paths and we shouldn't reject any question in our quest towards the living space we need: from questions that make sense to us today (like "How to use Uber-like services to enhance mobility and reduce the carbon footprint of our cities") to less obvious questions (like "How to use Pokemon Go to create more secure cities").

Delivering sustainable urban infrastructure – a feasibility study of two Western Cape municipalities

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Karen SHIPPEY, Provincial Government of the Western Cape, South Africa

This paper presents the investigation into the feasibility of an infrastructure paradigm shift for municipal services, away from the traditional models of delivery and towards a sustainability-centric response as an alternative. The study, commissioned by the Provincial Government of the Western Cape (Environmental Affairs and Development Planning) and undertaken by Aurecon South Africa, considers applying such responses to urban infrastructure within the municipal context of South Africa, by investigating the actual design of such settlements in two local municipalities, namely Swartland and Mossel Bay. This has ensured that the principles of sustainability have been grounded in real infrastructure responses that can be measured, quantified and costed.

At the core of the paper is a feasibility study of the impact of carefully selected, site-specific sustainable infrastructure interventions for the two sites, versus a Business As Usual approach to delivering urban infrastructure and housing. Through the development of a conceptual land use plan, the impact of various site-specific infrastructure options pertaining to water supply, waste water, energy, transport and solid waste management were assessed and quantified. Based on these findings, a financial and economic model has been generated to establish the various cost streams associated with the two sites, in terms of capital investment, maintenance, repair and refurbishment of assets and operations.

The outcome of the model demonstrates a direct comparison between a 'sustainable' infrastructure solution versus a Business As Usual approach, in terms of each cost stream. The findings demonstrate that tangible financial gains can be attained through alternative forms of infrastructure, while also highlighting the cash flow and capital requirements as well as the maturity of management systems that are essential to achieve a successful alternative infrastructure roll out.

1. PROJECT OVERVIEW

The overarching purpose of this project is to undertake a technical feasibility study to investigate the options for sustainable infrastructure provision in the Western Cape and the sustainability of the application thereof across the lifecycle of a predominantly residential development. The potential of this innovative, resource efficient and sustainable solution is to be assessed through the development of two "Integrated Sustainable Settlements" in the Western Cape. Two municipalities, Mossel Bay and Swartland, volunteered to participate in the project as pilot areas. Two prime greenfield sites close to the Central Business Districts of Malmesbury and Mossel Bay were chosen, in consultation with the municipalities, for the feasibility study.

Our approach acknowledges that this study is not only about sustainable and alternative infrastructure or human settlements, but about the creation of the balance between all the factors which work together to produce sustainable and resilient urban environments. The need is therefore to foster an approach to human settlements and service delivery which realises human settlement sustainability through innovation and integration.

The overall approach considers each component of human settlements as part of the overall urban fabric, with the notion that sustainability and resilience can only be achieved if it is viewed across a range of spatial scales. Infrastructure, the housing unit, precincts and the city-regional scale are to be treated as interrelated and interdependent systems which will together give rise to a sustainable human settlement, and thereby the facilitation of sustainable and resilient environments and

specifically incorporating the need for mixed use and mixed income settlement patterns.

This project had six phases, Phase 1 - Project Inception; Phase 2 - Establishment of Principles for Sustainable Human Settlements (SHS) and Site Selection; Phase 3 – Sustainable Infrastructure and Alternative Technology Review for Two Sites; Phase 4 – Integration, Optimisation & Concept Design; Phase 5 – Cost Benefit analysis and Financial Analysis and Phase 6 – Project Consolidation and Close-Out.

2. KEY PROJECT OUTCOMES – PRINCIPLES FOR THE DEVELOPMENT OF SUSTAINABLE HUMAN SETTLEMENTS (PHASE 2)

The review of principles, policies and approaches provided significant evidence of key themes in the sustainable development space. The role of these principles is to guide what sustainable human settlements should strive toward achieving or what strategic considerations settlements should contribute to.

3. THE USE OF MULTI CRITERIA ANALYSIS FOR SITE SELECTION (PHASE 2)

A multi-criteria analysis (MCA) was developed to provide an objective tool for the selection of sites appropriate for human settlement development. The site selection criteria focussed on land, legal and physical informants. These criteria/considerations were guided by and in line with the Sustainable Human Settlements core and secondary principles, insofar as was practical.

As a result of the outputs of the multi-criteria analysis, two sites were identified (one per municipality) as the most suited to testing the design concepts of a future sustainable human settlement. Focusing the study on two real sites, located within an existing urban context and fabric, helped to ensure that the concept designs and resultant infrastructure responses would reflect a study embedded in a real future human settlement.

4. SUSTAINABLE INFRASTRUCTURE AND ALTERNATIVE TECHNOLOGY REVIEW (PHASE 3)

The purpose of this review was to challenge the 'Business-as-usual' approach to service delivery by providing sound technical alternatives to current approaches, norms and standards. Cognisance is taken that technical solutions, whether old or new do not exist in isolation. Rather, they are impacted on and impact upon social, legal, institutional and financial considerations. The aim was therefore to explore the opportunities and constraints related to the delivery of municipal infrastructure in relation

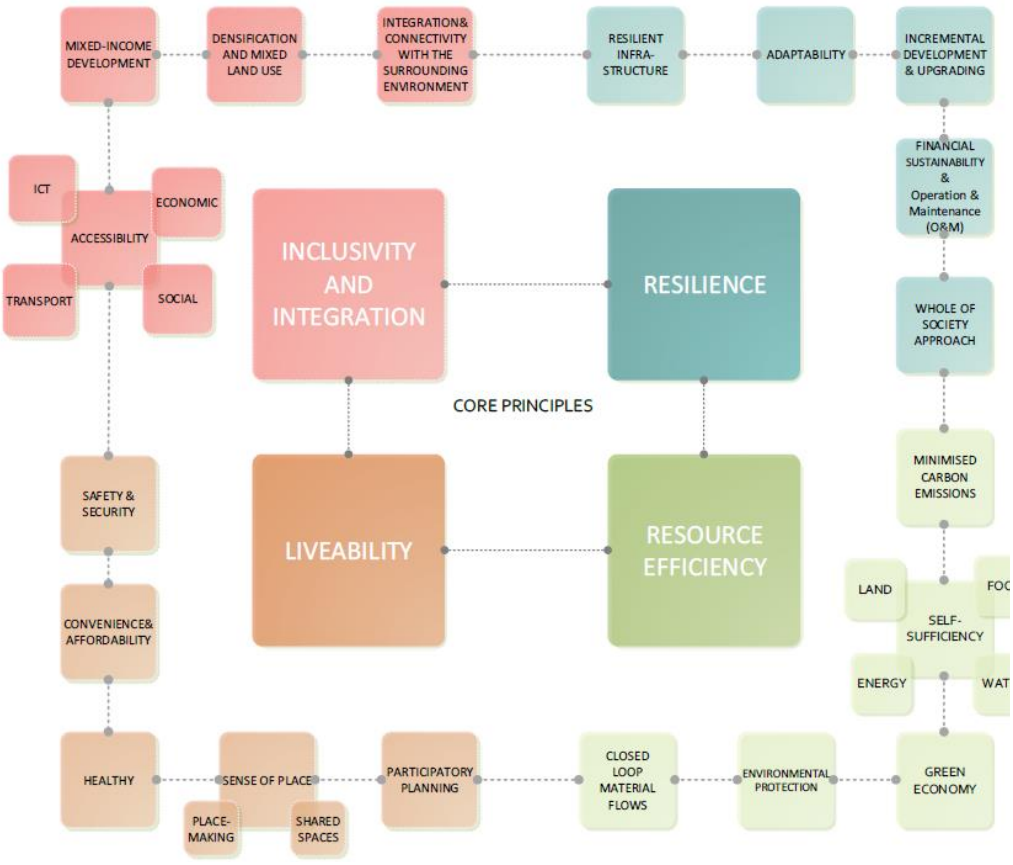

Figure 1: The identified principles for the Development of Sustainable Human Settlements

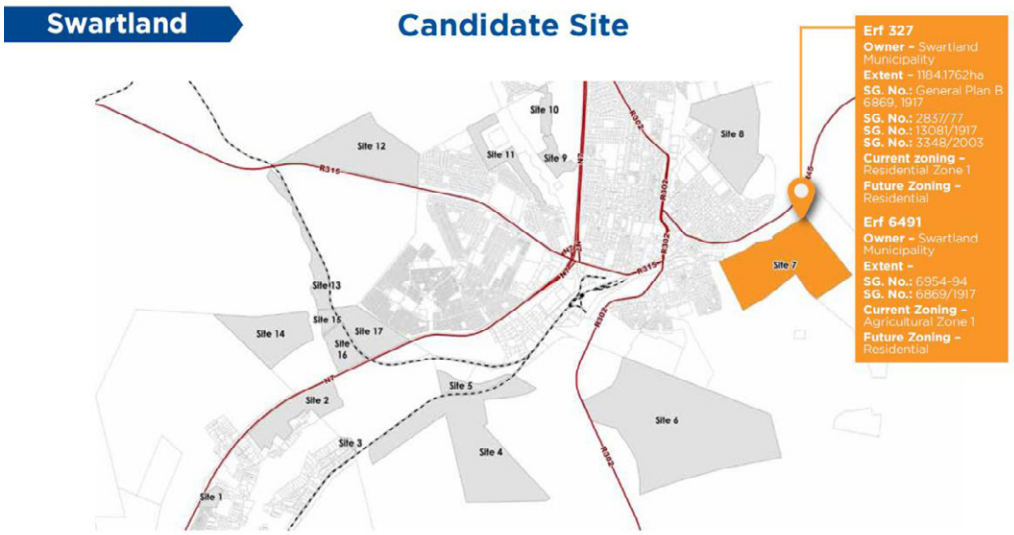

Figure 2: The selected Swartland candidate site

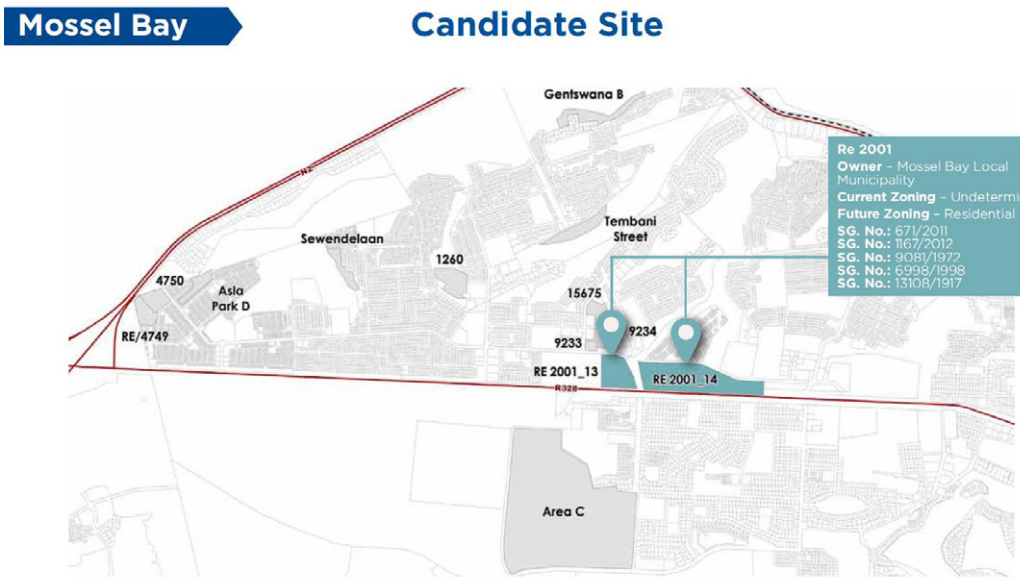

Figure 3: The selected Mossel Bay candidate site

to these considerations, and more specifically the opportunities and constraints of creating an enabling environment for the delivery of more resource efficient, resilient infrastructure systems which will form part of integrated and liveable sustainable human settlements.

Five streams of infrastructure were investigated in terms of options and possibilities for implementation at a municipal scale. These streams included: water, energy, transport and roads, solid waste management and buildings or "top structures".

A multi-criteria analysis table was used to provide a systematic approach to understanding the various opportunities and constraints associated with each intervention investigated. The findings of the infrastructure and technology review were used to inform possible interventions for each service type (water, energy, transport, waste) and for each site – Mossel Bay and Swartland.

Water	Energy	Transport	Waste
Low flow appliances	Solar PV	Public transport viability	Public drop off locations
Low flush toilets	Wind	Non-motorised streetscape design	Localised organic separation for biogas
Greywater system	Localised biogas	Permeable paving	
Rainwater harvesting			

Recommended sustainable technologies that were taken forward into the concept design and financial analysis phases were:

Much of the challenge of embracing alternative and sustainability-focused infrastructure in the real world is finding the balance between 'innovation' and 'reliability' through tried and tested forms of technology. This ensures that the study remains realistic in terms of real infrastructure that can be rolled out, at scale, with the requisite asset

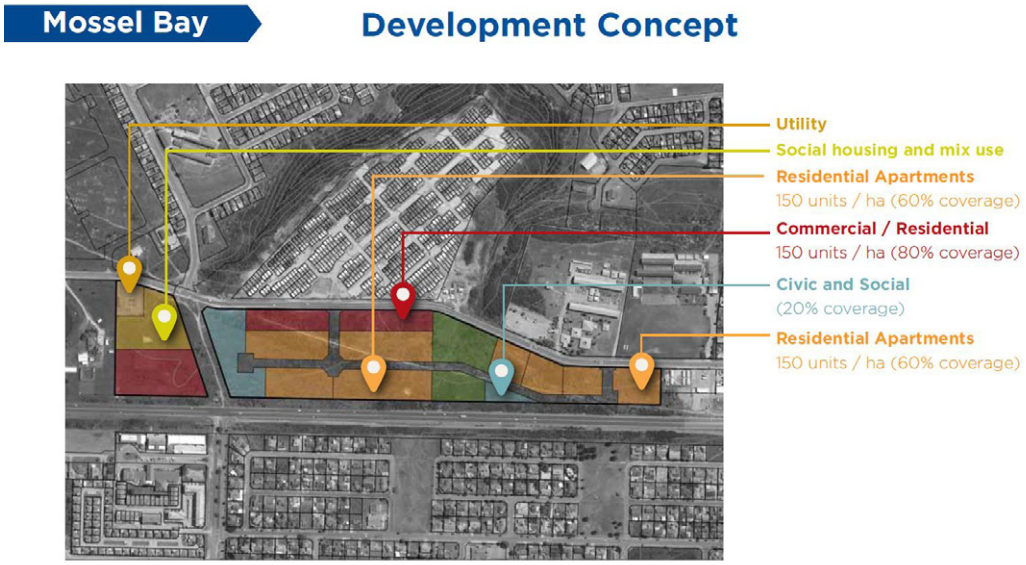

Figure 4: The Mossel Bay Concept Design for applying a sustainable infrastructure layout

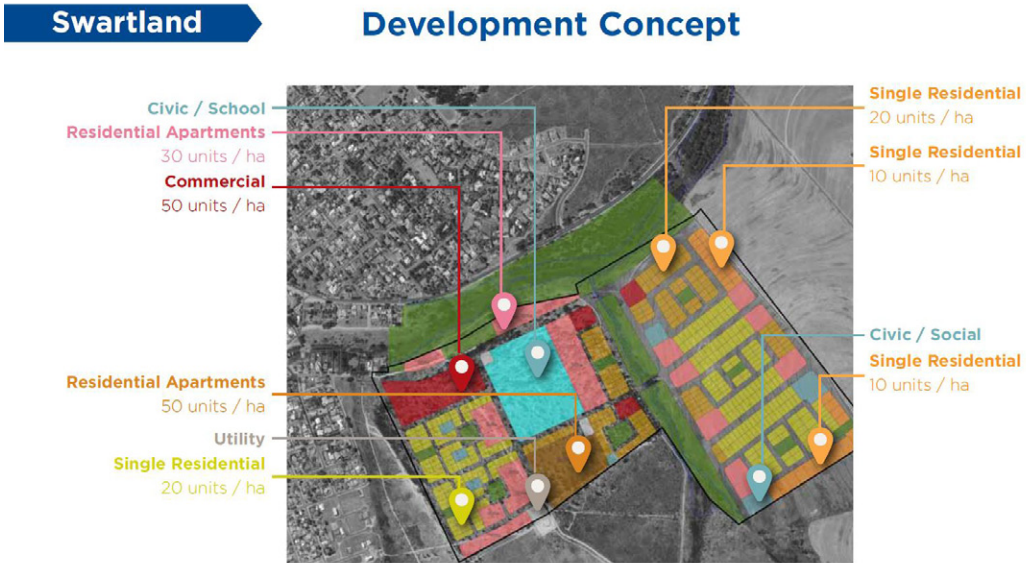

Figure 5: The Swartland Concept Design for applying a sustainable infrastructure layout

maturity to ensure functionality and fulfilling the service delivery imperative and responsibility of municipalities. The technologies that were selected represent this balance.

5. FUNDAMENTAL DESIGN CONCEPT (PHASE 4)

Two distinct, locally relevant and acceptable designs that are future ready were developed and used as a basis to calculate infrastructure solutions and costs.

Each of the five streams of infrastructure were applied to both sites and the difference in consumption between the provision of "Business-as-usual" infrastructure services versus the selected sustainable technologies was identified. The figure below illustrates how each of the recommended interventions were assessed in terms of their contribution to either reducing demand or augmenting the supply of the specific utility. This illustration highlights Potable Water and Energy, for the Swartland site, during the winter demand months.

The recommended intervention's relative contribution to demand reduction / augmentation of supply for all of water, energy and waste are

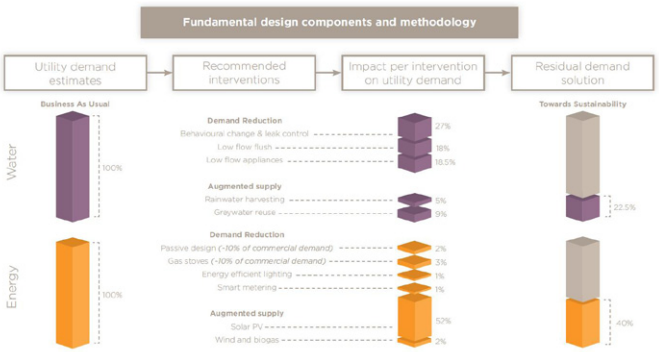

Figure 6: Contribution of technologies to utility demand reduction or supply augmentation

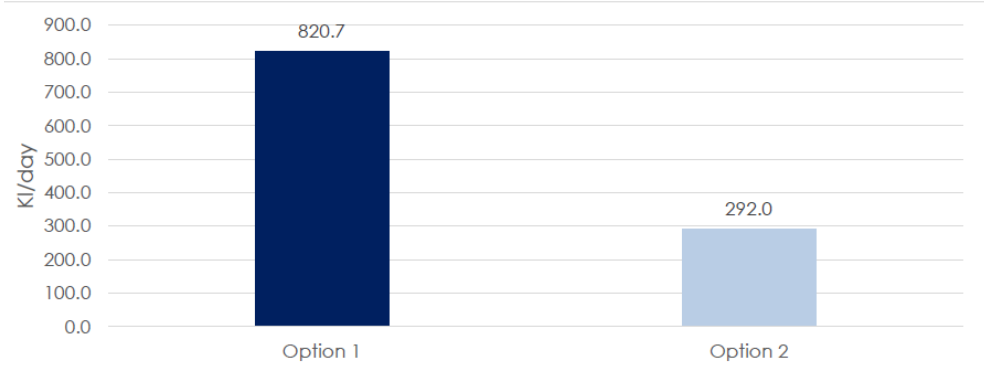

Figure 7: Water consumption for the Mossel Bay site (Option 1: Business-as-usual infrastructure, Option 2: Sustainable infrastructure)

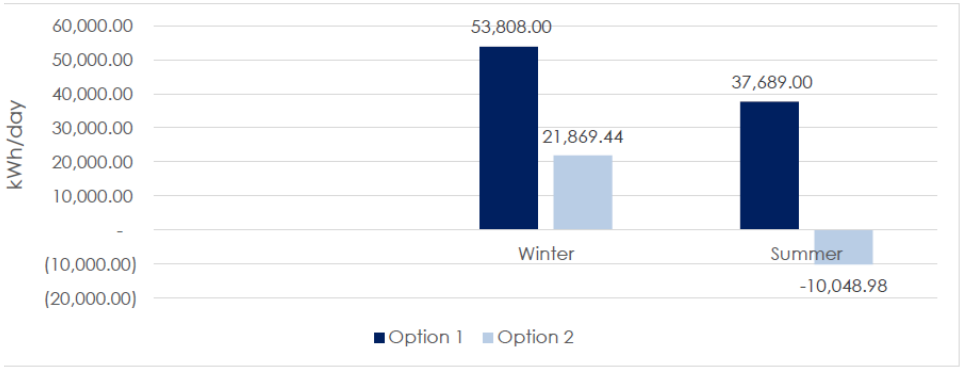

Figure 8: Electricity consumption for the Mossel Bay site (Option 1: Business-as-usual infrastructure, Option 2: Sustainable infrastructure)

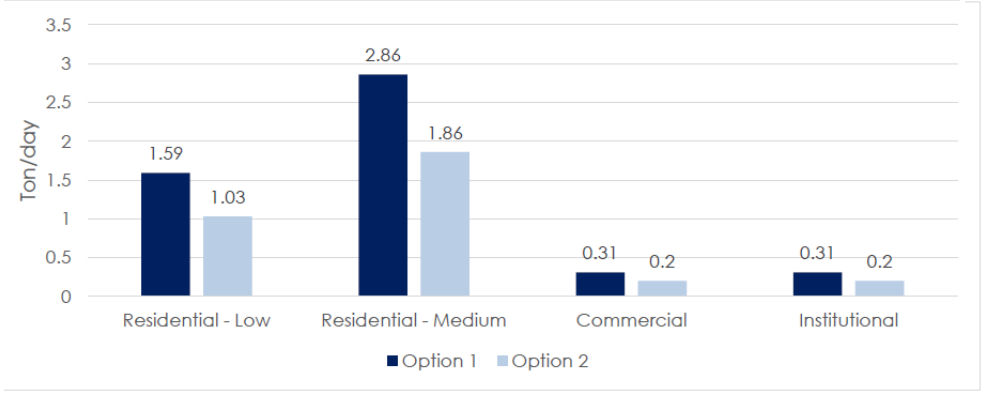

Figure 9: Waste generation for the Mossel Bay site (Option 1: Business-as-usual infrastructure, Option 2: Sustainable infrastructure)

documented in the figures 7-9, highlighting the significant utility savings that can be achieved through investment in these interventions. For the sake of brevity, only figures for Mossel Bay are illustrated. However the Swartland figures are comparable.

6. CAPEX, OPEX AND COST BENEFIT (PHASE 5)

The technologies selected were then assessed in the infrastructure lifecycle and financial analysis, in which current capital procurement costs, as well as operational and maintenance costs, were used to test the feasibility of the current Business-as-usual scenario (referred to as Option 1 in the figures below) against the sustainable solution (referred to as Option 2 in the figures below). This direct comparison was used to test the potential feasibility of the sustainable solution set. This was conducted in parallel with the socio-economic assessment of the effects of implementing the sustainable infrastructure option within settlements in the Western Cape.

Economic Impact Assessment studies are undertaken to determine, evaluate, and where possible, quantify the effects of an intervention. Both Business-as-Usual and the sustainable infrastructure options within both municipalities were identified as interventions, and were both modelled to comparatively identify the differing impacts. A Cost-Benefit Analysis (CBA) tool is used to evaluate the merits of the investment in terms of its total costs and benefits that are to be expected from the project. Overall, a CBA is useful in evaluating the attractiveness of different potential options, and will thus assist in the comparative analysis of both infrastructure development options.

A lifecycle cost model was developed to determine the total cost of the settlement infrastructure provision and operation into the future, feeding directly into the economic impact analysis.

The number of jobs created by the developments is higher for the sustainable infrastructure option

Parameter	Comment
Analysis period	An analysis period of 40 years was selected due to the long lived nature of infrastructure assets. The start year is 2016.
Escalation	To keep the model simple, all costs are assumed to escalate at inflation rate. There is one exception: energy operations costs are assumed to escalate at 5% above inflation for the next 10 years and then at inflation beyond that.
Future value	All modelling values are shown in 2016 Rand value at the real rate of inflation i.e. only the rate in excess of normal inflation. Using the uninflated values is useful for showing lifecycle costs over a long analysis period.
Revenue	The model represents the total cost and no revenue is included for the trading between agents.
Salvage value	The salvage value is the carrying value (book value) of the asset portfolio at the end of the analysis period after accounting for capitalisation and depreciation. The salvage value is used in the net present value analysis to account for the timing of investment and the selection of the analysis period.
CAPEX	
Construction period	The construction period over which the full infrastructure is developed is assumed to be 6 years.
Initial capital costs	Initial CAPEX costs are estimated from the design undertaken by the engineering team using present day technology at present day costs. The model excludes the acquisition cost of the land and the cost to develop the top structures.
Subsequent capital costs (asset renewal)	Subsequent CAPEX costs are based on the renewal of the assets at the end of their expected useful lives.
OPEX	
Operations cost	Operations costs are the costs associated with service consumption e.g. energy and water purchases at the current retail rate
Maintenance cost	Maintenance costs include both preventative and reactive maintenance activities.

Table 1: Key assumptions and parameters for the life cycle cost analysis

during construction, but lower during operation (see table 2 below). The large majority of long term employment generated by the Business-as-usual scenario will occur during the operational period as indirect and induced impacts. This is due to the significant capital spent on operations when compared to the sustainable infrastructure option. Therefore, the social and income losses as a consequence of this expenditure should be considered alongside the generation of employment.

The figure below demonstrate the high percentage of total cost that is attributed to electricity provision. This is owing to the significant investment in solar PV generation, for both sites, at current market related prices.

The total costs (including electricity) for all the major cost streams (Total construction CAPEX, operating costs, maintenance costs and refurbishments) are provided below, for Mossel Bay (the figures for Swartland follow a similar trend). These adequately demonstrate the overall lifecycle saving for the sustainable infrastructure option for both sites, that despite a high initial CAPEX cost for the sustainable option, the long term operational cost is much lower.

By reflecting the CAPEX in the form of annual depreciation over the expected life of the infrastructure assets, an annualized cost of ownership is illustrated for the two scenarios. The annualized financial savings generated by the sustainable option are clearly demonstrated in the following figure.

TOTAL socio-economic impacts	Option 1	Option 2
Mossel Bay Municipality Construction		
Impact on Production	R207 M	R1 307 M
Impact on GDP	R67 M	R402 M
Impact on Employment	757	1 872
Impact on Income	R31 M	R189 M
Mossel Bay Municipality Operations & Maintenance		
Impact on Production	R3 469 M	R734 M
Impact on GDP	R1 552 M	R263 M
Impact on Employment	3 192	777
Impact on Income	R604 M	R115 M
Swartland Municipality Construction		
Impact on Production	R826 M	R2 959 M
Impact on GDP	R258 M	R903 M
Impact on Employment	1 436	3 468
Impact on Income	R123 M	R430 M
Swartland Municipality Operations & Maintenance		
Impact on Production	R5 660 M	R1 070 M
Impact on GDP	R2 513 M	R363 M
Impact on Employment	5 281	1 318
Impact on Income	R982 M	R164 M

Table 2: Summary of total socio-economic impacts of the development options at both sites

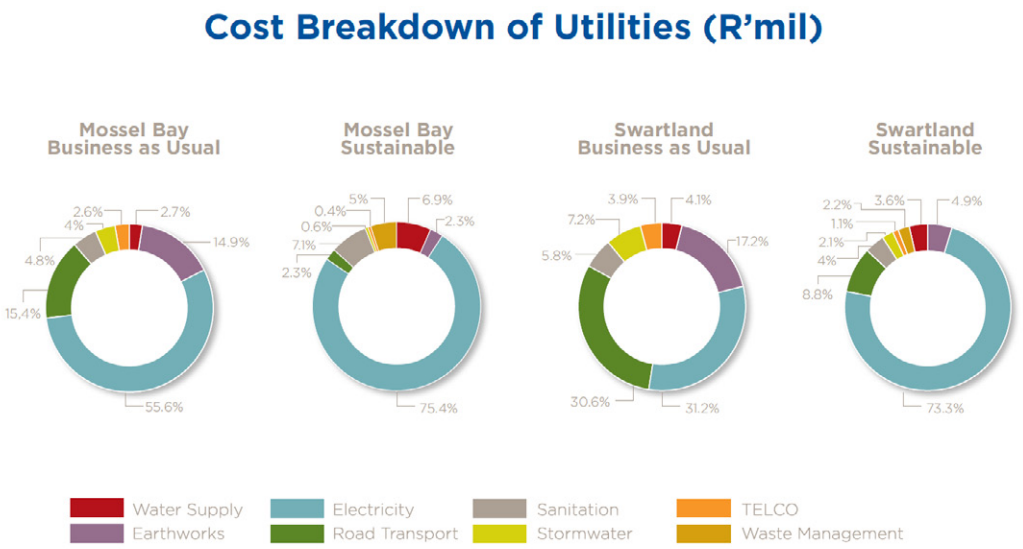

Figure 10: Capital expenditure breakdown per asset type for BAU and Sustainable scenarios

Such a savings gap illustrates the potential for a feasible exploitation via various forms of financing and structuring of the operations and management of the settlement, particularly the generation and sales of energy.

7. FOCUS ON ENERGY

Regarding operational cost, the different services were not separated out, but due to the significantly higher cost of electricity CAPEX, OPEX and maintenance in general, the trend of the amounts in the accumulated costs analysis below can be seen to be applicable to energy.

For both sites, the sustainable infrastructure option is less costly to residents than the business-as-usual scenario from an operational perspective. Although the capital outlay for the municipality is significant for Option 2 (the sustainable infrastructure option), a large proportion of the costs are associated with energy costs. Thus, were a private owner/management company to invest this value, total costs accrued to the municipality by the development of Option 2 will equate to lower than the costs for Option 1.

The sustainable utilities – specifically the solar technologies – make up a significant portion of the total CAPEX outlay for both sites. Essentially, the operational and maintenance costs accrued by users of the sites is significantly lower in Option 2 when compared to Option 1, making Option 2 the preferred development – both economically and financially for the user. CAPEX costs are extensive and although additional sources of revenue may be accessed to reduce these costs, the current high technology costs remain a barrier for development.

It is important to note that the model does not consider increasing electricity rates over the 40 year period, however considering historical increases and the continued challenges experienced within

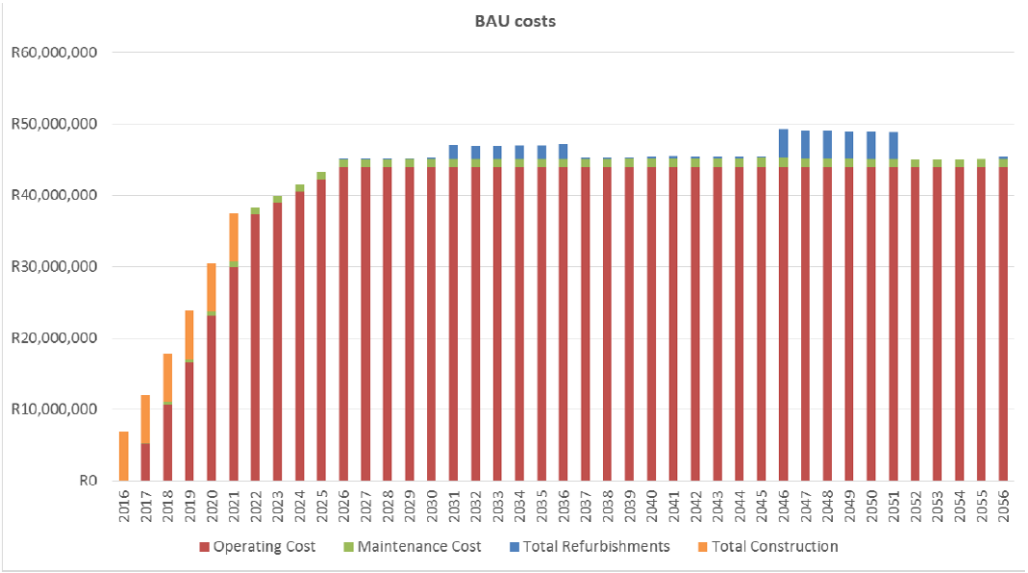

Figure 11: Total Costs for the Mossel Bay site (Option 1 – Business-as-usual)

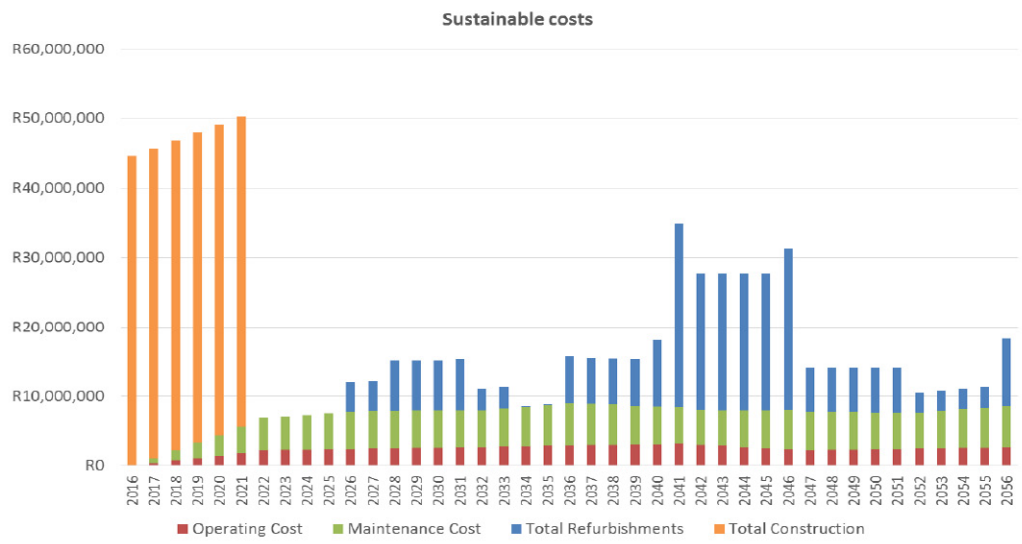

Figure 12: Total Costs for the Mossel Bay site (Option 2 – sustainable infrastructure)

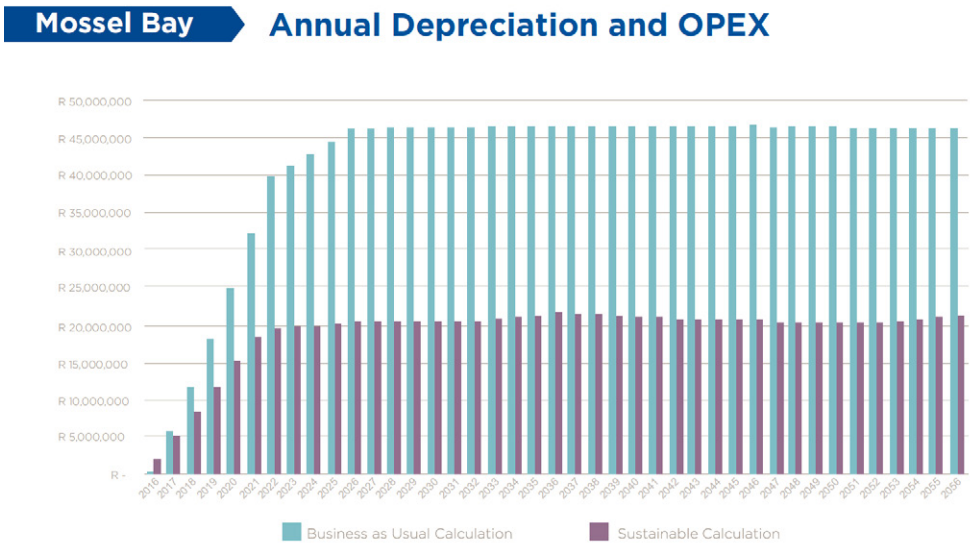

Figure 13: Savings gap of approximately 25 Million ZAR per annum for the sustainable option, based on NPV figures

South Africa through power generation, it is unlikely that electricity rates will decrease during the project timeline. Furthermore, one must also consider that the cost of sustainable technologies is continuously decreasing and this will further improve the outlook for the sustainable infrastructure option.

The report finds, as a key recommendation, that different contractual or ownership arrangements are necessary to ensure that the development is financially viable for both the users and municipalities. These arrangements are specifically with regard to the management and/or ownership of the structures, as well as the utilities. Essentially, upon the capital investment into renewable technologies, the management/ ownership consortium will generate "free" energy and make a profit on this energy by sales to users. The consortium may set a tariff which ensures the financial feasibility (although lower than Eskom tariffs) which will benefit the users as well as their bottom line. The scalability of energy production should also be considered.

8. FINANCING

Importantly, the sustainable infrastructure option (Option 2) is the preferred option from a social, economic and environmental perspective, as well as from the Cost Benefit Analysis findings. Not only is it aligned with national and provincial government development goals, but with the increasing global and national recognition of the need for smart and integrated urban nodes. Considering the housing demand by a large portion of low income South African households; the housing redress system (BNG[1] housing) has increasingly been highlighted as flawed, for both housing beneficiaries and the public sector. This is specifically within the context of changing social, economic and environmental circumstances. Furthermore, increasing utilities costs and a constrained national grid highlights a necessary adjustment to the approach adopted in the built environment and the provision of housing.

[1] Breaking New Ground

OPTION	CAPEX		OPEX		Maintenance		TOTAL
BAU: Option 1							
% Payable by Municipality	100%	R108 M	18%	R285 M	100%	R41 M	R434 M
% Payable by Future Residents	0%	R0	82%	R1, 3 B	0%	R0	R1, 3 B
Integrated sustainable development: Option 2							
% Payable by Municipality	100%	R533 M	5%	R5 M	78%	R157 M	R695 M
% Payable by Future Residents	0%	R0	95%	R90 M	22%	R45 M	R135 M

Table 3: Accumulated costs for Mossel Bay

OPTION	CAPEX		OPEX		Maintenance		TOTAL
BAU: Option 1							
% Payable by Municipality	100%	R288 M	52%	R1, 3 B	100%	R107 M	R1, 7 B
% Payable by Future Residents	0%	R0	48%	R1, 2 B	0%	R0	R1, 2 B
Integrated sustainable development: Option 2							
% Payable by Municipality	100%	R1, 1 B	28%	R26 M	82%	R258 M	R1, 3 B
% Payable by Future Residents	0%	R0	72%	R70 M	18%	R58 M	R128 M

Table 4: Accumulated costs for Swartland

Therefore, within this context, although the sustainable approach is identified as effecting higher positive social and economic implications, to enable the adoption and roll-out of sustainable developments, further analysis with regard to the financial feasibility is required. The high capital costs required for Option 2 present a significant investment challenge to municipalities due to current financial management requirements and existing human settlement and infrastructure grant systems, despite user costs being considerably lower for Option 2. Therefore, because this assessment is geared towards changing the approach to settlements to benefit the public sector, beneficiaries and potential private investors, identifying applicable and effective financial solutions is fundamental.

The project report contains an extensive discussion on financing options and the findings indicate that the financial feasibility of development Option 2 is potentially viable. This is specifically with regard to the private ownership/management of the energy generation technology component of the development which will serve to reduce the capital costs significantly. Additional grants and income derived from the sales and rental of property will additionally contribute towards the feasibility of the development.

9. CONCLUSION

While further studies are required into contractual and ownership arrangements for the infrastructure in order to balance the high initial CAPEX costs with significant OPEX savings, the potential has been identified for a paradigm shift in terms of the types and focus of traditional urban infrastructure, towards a more carbon-smart, resource efficient and self-sustaining solution. This shift can be motivated in terms of specific benefits:

- OPEX savings: reduced operating costs, particularly in terms of energy generation costs;
- Environmental considerations, with significantly reduced potable water consumption, as well as low carbon energy generation;
- Social benefits in the form of localised labour, upskilling of artisans and supply chain demand for sustainable technologies;

It is essential that, as a key recommendation, different contractual or ownership arrangements be established to ensure that provision and maintenance of alternative infrastructure is financially viable for the end user, the municipality and the utility service provider. The alternative infrastructure proposed in this study operates most efficiently at a precinct-wide scale, thus discarding individual household ownership models, with the focus on community-wide integration.

Transforming Mumbai city: removing the bottlenecks to achieve future sustainability

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Growth of Mumbai city (population 12.4 million, 2011) has almost saturated and problems such as housing shortage, infrastructure deterioration, environmental degradation, transportation, and scarcity of land resources have attracted a good deal of attention among policy makers. Further, declining growth rate, a low floor area ratio, income inequalities, and geographical constraints (three sides bounded by the sea), prevalent in the city among others, call for redefining the ways of future urban development to achieve sustainability. This paper provides a clue for policymakers to take careful decisions for removing bottlenecks and plan for a sustainable city.

1. RESEARCH BACKGROUND

Urban India accommodated 377 million people (31.2% of total population), the second largest urban population in the world (Census of India, 2011a). According to United Nation's estimate by the year 2050, half of India's populations are expected to live in urban areas (United Nations, 2014). Many Indian large cities, especially the large metropolises and metropolitan regions are facing problems with respect to their growth, composition, spatial spread, congestion, environmental factors, housing aspects, infrastructure availability as well as accessibility. New challenges such as globalization, demographic change and shortage of future developable land make it necessary to tackle metropolitan growth in a rational manner particularly in the Indian context. Mumbai (administered by Municipal Corporation of Greater Mumbai) is no longer an exception. Mehta (2012) in his research termed Mumbai as 'Maximum city' through highlighting everyday problems of people who inhabit the stunning metropolis. Mumbai continues to see population increases although its carrying capacity already exceeded (Mumbai HDR, 2009). The over-concentration of population and over-development beyond the carrying capacity has created adverse impact on sustainability for Mumbai and the Mumbai Metropolitan Region (MMR) as a whole.

This paper proceeds in six sections. Following introduction, Section 2 presents theoretical aspects and past research related to sustainability and economic forecasting models. Section 3 specifies the methodological framework and how it was applied. Section 4 presents the current state of metropolitan growth, population overconcentration, lack of future developable land, rapidly decreasing natural areas, low FAR (Floor Area Ratio) etc., in Mumbai. Section 5 focuses on assessing the urban carrying capacity of Mumbai city through worker based 'Relative Employment Potential (REP) model' and carrying capacity based 'Sustainable Accommodation through Feedback Evaluation (SAFE)' model. After validation of the REP model, scenarios for two forwarding decades have been forecasted. Further, the SAFE model has been tested with various FAR options (with existing FAR and with increased FAR) to find out future FAR requirements for Mumbai. Finally, Section 6 synthesizes the findings and presents policy implications.

2. LITERATURE REVIEW

Initial regional development and growth model includes stages of economic growth by Rostow (1960), circular and cumulative causation by Myrdal (1966), relative income potential by Isard (1962), modified neoclassical growth model for the regional context by Borts and Stein (1964), change in market potential by Difiglio (1968). Richardson (1974) discusses that income potential and gravity models are members of the same family and its application includes regional economic projections (Isard and Freutel, Isard and Bramhall, and Difiglio), the measurement of market accessibility in the analysis of location of location of industry or agriculture (Harris, Dunn, Clark, Wilson and Bradely), spatial price theory (Warntz), income potential contour mapping (Stewart and Warntz), as a determinant of migration (Vanderkamp) and as the main component of investment in a regional growth model (Olsen

and Peaker). More recent empirical studies on the regional economic growth includes geographic clustering for national industrial competitiveness by Porter (1990), relationship between public investment and regional economic growth by Button (1998) and interregional convergence by Barro and Sala-i-Martin (1999). Population forecasting empirical studies on model includes cohort analysis by Wunsch and Termote (1978), an econometric model using cross-sectional data of 131 Dutch cities and villages by Bierens and Hoever (1985), expert-based stochastic population forecasting method by (Billari, et al., 2012), the Bayesian paradigm by Guimarães (2014). There is always scope to revisit the existing economy based population forecasting models and suggesting new or modified models applicable for developing world.

The concept of carrying capacity originated from ecology and mainly focused of environmental and man-made physical factors over a long period of time (Rees, 1992; Abernethy, 2001; Schneider et al., 1978; Liu, 2012; Oh et al., 2005). Researchers worked on other non-environmental factors determining carrying capacity particularly last four decades and accordingly many factors included in carrying capacity assessment. It includes technical, socio-economic and cultural components by Schroll (2012), human attitudes, values, and behaviour by Godschalk, Axler (1977), economic, social, environmental, and institutional (Liu, 2012; Downs et al., 2008). Several evaluation methods and tools evolve for assessing carrying capacity such as infrastructure and land use based methods (Oh et al., 2005), Visual threshold carrying capacity tool (Oh, 1998), relative carrying capacity based on grey relevant degree (Xu et al., 2010), environmental carrying capacity theory and ubiquitous technology (Lee et al., 2012). According to Wei (2015), carrying capacity is an evolving tool for monitoring sustainable development.

3. METHODOLOGY

REP Model developed based on principles of Walter Isard's Relative Income Potential (RIP) model (1962). Since estimation of income potential at regional level, especially at metropolitan level, is quite difficult and unreliable due to information gaps on income, it is considered, in this study, that employment of urban sector can serve the role of a good surrogate for urban income. Under-reporting of Income is a common problem while conducting household survey in developing countries (Hicks, 2011). In current study the model is assumed to remain same structurally as RIP model presents, but the principal variable is replaced by employment variable and the modified model is designated in this study as REP model. Thus REP model estimates growth by two relevant components namely;

i. Proportionality Effect (A)

ii. Effect of Region's Change in Interregional Position (B)

Hence, the model to be developed consists of two elements or two terms. The first express the proportionality effect on market sensitive activities (as the nation grows). In this case as MMR grows, all of its satellite towns will also grow due to proportionally effect. Proportionality effect (A) equation is as follows;

$$A = \sum f * \left(\frac{E_r^{t+\theta}}{E_r^t} \times E_i^t \right)$$

Where:

E = number of workers

f = factors which converts number of employment into number of population or dependency ratio

$t+\theta$ = forecasting year

t= base year

i= city i (urban units of MMR)

r = specific region (here MMR)

The second element or term of the model refers to a region's change in interregional position, that is, to an improvement or deterioration in a region's total access to the employment market. The second set covers the forces that generate improvement or deterioration in a region's (here any urban component of MMR) interregional position, such position being relative. Proportionality effect not expected as it overstates or understates growth, hence urban components change in interregional position modifies the REP when composed with Proportionality effect. Thus any urban component's change in interregional position (B) can be derived by the reconstituted model as follows;

$$B = \quad b * \left(\frac{{}_i^{t+\theta}V}{\rho_i^t V} - 1 \right) p_r^t$$

Where:

b= positive constant

ρ= ratio (dependency ratio)

t+θ= forecast period

t= base year

i= city i (urban units of MMR)

r= specific region (here MMR)

p = Population

Where: $${}^{t+\theta}_{i}V = \frac{{}^{t+\theta}E_1}{d_{i1}} + \frac{{}^{t+\theta}E_2}{d_{i2}} + \cdots + \frac{{}^{t+\theta}E_n}{d_{in}}$$

$${}^{t}_{i}V = \frac{{}^{t}E_1}{d_{i1}} + \frac{{}^{t}E_2}{d_{i2}} + \cdots + \frac{{}^{t}E_n}{d_{in}}$$

Where:

Interacting urban units are designated as (1,2,.....n) and

E1= Employment of urban unit1,

En= Employment of urban unit n,

di1= distance through public transport (bus) of urban unit 1,

din= distance through public transport (bus) of urban unit n and so on.

It is clear that we must eliminate from this ratio of employment potentials the general effect of regional growth or decline of employment. Such a task is easily done by multiplying the denominator of the ratio by a factor called dependency ratio.

Finally $$P_{t+\theta} = A + B$$

Where:

Pt+θ= Forecasted Population

A= Proportionality Effect,

B= Urban Components change in inter-regional position.

In the above model the proportionality effect and the factor of urban components change in interregional position are considered as additive. Since the two terms are additive, each is expressed in the same units, namely population numbers. This model is used here for future population allocation of all urban units of MMR. Applying this model for 2001 census data, the population of 2011 has been validated. After validation and necessary modification scenarios for two forwarding decades 2021 and 2031 could be forecasted.

Further SAFE model can be used in any urban area for assessing the carrying capacity (Sharma et al, 2012) and the same applied for Mumbai to estimate future land and FAR requirements. The carrying capacity of the area can be calculated using the following equation:

CC= AU - (AND + AIF) x FAR/S

Where,

CC= Carrying Capacity,

AU = total urban area,

AND= net non-developable area,

AIF = area for infrastructure development,

FAR = Floor Area Ratio and

S = Floor area requirement per head.

Due to non-availability of more recent data, land use survey conducted in 2008 by Mumbai Metropolitan Regional Development Authority (MMRDA) is considered as base period source of information for present study. Municipal boundary expansion in future is not considered as scope of present study because Mumbai has geographical constraints for expansion. This paper describes the method by which future population can be forecasted for Mumbai city through REP and carrying capacity based SAFE model.

4. MUMBAI: THE CASE STUDY

Mumbai has not only become the biggest city in India, population-wise, but it is also the core of the biggest urban agglomeration in the country and is poised to be the world's third largest agglomeration after Tokyo and Maxico city (Mumbai HDR, 2009). It is seen from Table-1 that since 1901 there is a continuous growth of population in Mumbai in absolute number till 2011. On the contrary the annual average growth rate has drastically been reduced from that of 2.37% during 1901-11 to 0.44% during 2001-2011. It is clear that a significant rise in growth rate (4.28%) had taken place only during 1961-1971 but after that the growth rate has indicated a steady falling trend over the last four decades. It is presumed that the

Year	Population (in Million)	Annual Average Growth Rate (in %)	Year	Population (in Million)	Annual Average Growth Rate (in %)
1901	0.92	-	1961	4.15	3.87
1911	1.14	2.37	1971	5.93	4.28
1921	1.38	2.03	1981	8.24	3.90
1931	1.39	0.12	1991	9.92	2.04
1941	1.80	2.89	2001	11.91	2.00
1951	2.99	6.62	2011	12.44	0.44

Table 1: Population Growth and Growth rate of Mumbai (1901-2011). Source: Census of India, 1901-2011b

same trend may possibly continue for the coming decades also.

It is obvious that the population influx in Mumbai is an obvious result of continuous flow of migrants to Mumbai from surrounding areas and other regions. Nearly half (43.7 per cent) of the population had been categorised as migrants in the 2001 Census (HDR, 2009). Mumbai covers a space of 10% geographical area and has a population share of almost 60% of MMR. Over 1971-2011 period, the gross density of Mumbai increased from 13,391 persons per km2 to 28,420 persons per km2. This puts a tremendous pressure on existing land use, environment and infrastructure. Built-up land has more than doubled from being 25% of total area in 1971 (MMRDA, 2008) to 60.59% in 0212 (Draft DP, 2014-2034). Natural areas and open spaces (forest, water body, coastal wetlands etc.) have been rapidly decreasing from 61% of total land in 1971 (MMRDA, 2008) to 31.5% of the same in 2012 (Draft DP, 2014-2034) (See Fig. 1). Considering the very high population density prevalent in Mumbai, the low per capita open space availability (1.24 m2 per person) is an expected outcome.

An analysis of urbanizable land potential at Mumbai shows that only 9.47 km2 of land is available for future development (MMRDA, 2008). According to Bertaud (2008), Mumbai FAR values are low, uniform over very large areas. In planning for majority of Metropolitan cities the maximum residential FAR values considered is 3.5 (Sridhar, 2010) whereas cities like Mumbai, the permitted FSI is uniform and in 1991 was fixed at 1.33 for the Island City and 1.00 for the suburbs, although some higher FAR has been allowed in some isolated lots outside the Island City area through the program called Tradable Development Rights (TDR) (Fig 2) (Bertaud, 2011).

City like Mumbai where geographical constraints exists for horizontal expansion (three sides bounded by the sea and northern side limited expansion possible because of hills and reserve forest), the

Figure 1: Temporal Change of Built up area, Natural areas and Open Spaces at Mumbai (1971-2012). Souce: Transform Study, MMRDA, Draft DP (2014-2034).

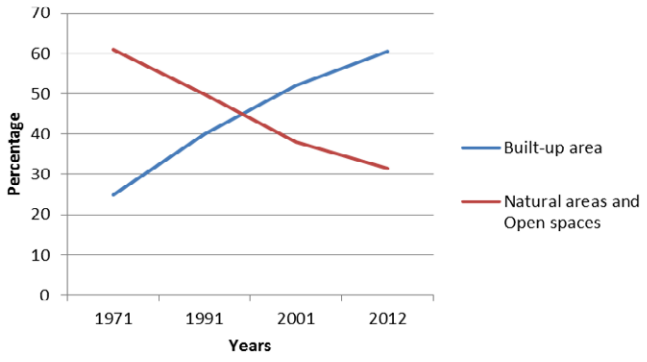
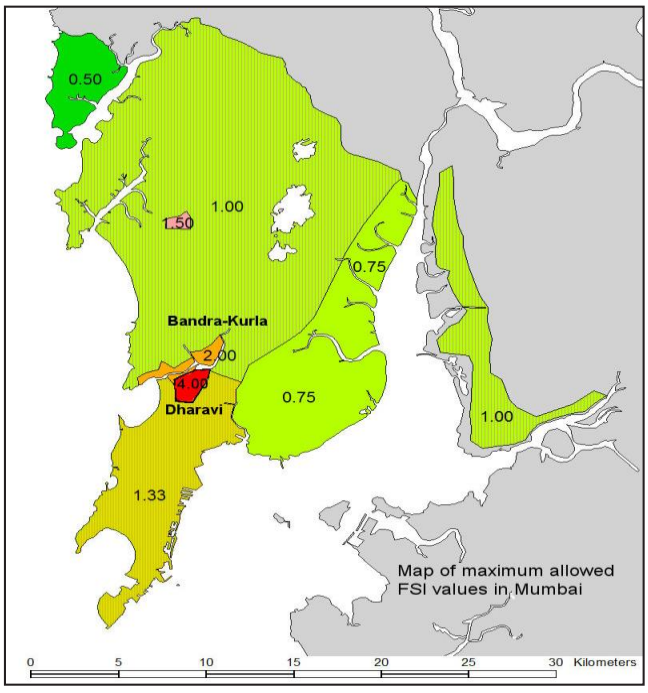


Figure 2. Distribution of FSI values in Mumbai. Souce: Bertaud, 2011



following strategy can be adopted for areas where future developable land is insufficient;

- Re-densification of space depending upon maximum permissible FAR
- Increase FAR for accommodating future population
- Channelizing the excess population to satellite towns of Mumbai

5. RESULTS AND DISCUSSION

5.1 Application of REP and SAFE model for rationality of existing population distribution

Based on past population trend and REP model developed above, 2011 population has been validated to find out whether the model works in real situation or not. In this REP forecasting exercise, t and t+□ are taken as 2001 and 2011 and based on MMR data source, dependency ratio (f) is considered as 2.51. Distance matrix has been prepared through primary survey based on road distance through public transport routes. Constant value (b=0.37) could be derived through regression analysis (by least square method) of available existing census (2011) information. Mean Standard Error calculated for the model value is 9.56 and population variation for MMR is 12.60%.

For applying the SAFE model required land and other infrastructure details have been taken from 'Transform' study conducted by MMRDA. Floor area required per head has been calculated from 2011 census. Population estimates (validation) and carrying capacity has been calculated with existing FAR for Mumbai and the same are represented in Table no-2. For Mumbai with FAR 1, the maximum carrying capacity has been estimated to be 8.27 million. In Mumbai, particularly in island city the maximum FAR has been found to be 1.33 and with 1.33 FAR, the carrying capacity has been to be estimated 11.10 million.

Mumbai has already crossed its carrying capacity and the same requires immediate attention for policy makers. Mumbai, as per 2011 census, had 12.44 million population and accordingly suggested FAR should be 1.5. With 1.5 FAR the carrying capacity has been worked out to be 12.42 million and naturally the prime target remains as to decentralize additional population from Mumbai.

5.2 Population forecasting through REP model and sustainability through SAFE model

After validation of REP model the same method has been applied for projecting population for the years 2021 and 2031. According to REP model, the population predicted for Mumbai is seen to be 17.35 million and 17.86 million for 2021 and 2031 census years, respectively. Population allocation for future decades has been based on space and floor area requirements for Mumbai. For the same, various FAR options (with increased FAR) are tested to find out the optimum FAR requirements for Mumbai city. Table-3 depicts population allocation for the census year 2021 and 2031 and accordingly spatial sustenance has been worked out with various FAR combinations (FAR 2.0 and FAR 2.5) for Mumbai.

It may also be noted that the increase in FAR will directly call for immediate improvement of infrastructural conditions of Mumbai. FAR increase with supporting infrastructural augmentation remains as the sole but immediate solution for already saturated Mumbai. The increase of FAR depends on and affect both the physical form of Mumbai and its functioning and present research is just one of many inputs which could justify the actual changes in policy making. Accordingly for 2031, FAR 2.0 is suggested for Mumbai. With 2.0 FAR, the carrying capacity has been worked out to be 16.55 million and naturally the prime focus remains as to decentralize 1.30 million populations from Mumbai. This calls for channelizing this excess population to satellite towns of MMR. For Mumbai, since scope of urban boundary expansion is limited, accordingly

Table 2. Population estimates based on REP model and carrying capacity based SAFE model for Mumbai. Note: *with FAR 1.33 carrying capacity 11.10 million. Source: + Census of India, 2011b

Population Allocation based on REP Model-2011 (in million)	Census Population- 2011 (in million)+	Variation with respect to Census population and REP Model (in million)	Carrying Capacity (in million) with existing FAR	Carrying Capacity (in million) with increased FAR 1.5
15.82	12.44	3.38	8.27*	12.42

Table No 3– Population allocation through REP model and sustainability through SAFE model for Mumbai

Population Allocation through REP Model-2021 (in million)	Population Allocation through REP Model-2031 (in million)	Carrying Capacity (in million) with increased FAR 2.0	Carrying Capacity (in million) with increased FAR 2.5
17.35	17.86	16.55	20.69

channelizing the excess population to satellite towns of MMR is the ultimate long term solution. Additional population of Mumbai can be distributed to Kalyan-Dombivali, Navi Mumbai, Vasai-Virar City and Bhiwandi-Nizampur where more space will be available after meeting their own population demand. Some industries should be reallocated outward Mumbai through stimulatory subsidies under a decentralization policy. Regional linkages through public transport (bus and rail based) need to be improved for better interaction not only for Mumbai with other satellite towns but also among satellite towns each other.

6. CONCLUSION

To overcome urbanization challenges in Mumbai, the emphasis should be on compact sustainable urban form (shape, density and land use) that reduce over exploitation of natural resources, accelerate economic viability, assure livability, promote environmental quality and confirm social equality. Urban compaction aims to increase built-up area and residential population densities, to intensify urban economic social and cultural activities and to achieve sustainable benefits. Linkage of spatial aspects of urban development with economic, social and environmental components, in particular to achieve mixed use, calls for both vertical and horizontal integration. The rapid influx of urban population is the immediate cause for the over development of Mumbai. From this research, it appears that carrying capacity of Mumbai is already saturated and only 9.4 km2 of future developable land will not be able to take care of the urban load of Mumbai in future. As FAR value of Mumbai is very low, the same can be increased from 1.0 (island city 1.33) to 1.5 to accommodate existing residential demand and further FAR 2.0 to accommodating future population demand. Satellite towns like Navi Mumbai, Thane, Vasai-Virar city etc. did not fulfill their expected role in sharing Mumbai's over concentrated population and activities. It is also necessary to frame a policy aiming at decentralization of metropolitan growth, particularly from Mumbai, and allocation of surplus population to the capable satellite towns for balanced development of entire MMR. Present research provides a clue for policymakers which could justify actual changes of policy making with regards to the extent to which the urban population should be decentralized. This paper can play a pivotal role of examining the problem of metropolitan growth and developing a systematic model encompassing economic growth applicable for metropolitan cities in developing world.

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The American dream: urban densities in South African cities

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South African cities are some of the least dense in the world, more similar to their North American, Western European and Australian counterparts, than cities in Asia, South America and other regions in Africa. This paper investigates the root causes of this phenomenon; its implications for urban inhabitants; and argues that in order for the issue to be addressed South African cities must adopt a culture of densification to achieve the qualities of the good city.

INTRODUCTION

At the dawn of democracy in 1994, South African cities were characterised by highly inequitable patterns of land distribution, unequal access to social and economic opportunities, poorly located lower income settlements, and under-developed public transport infrastructure (Du Plessis and Boonzaaier, 2015). Added to this, were the problems of urban sprawl, unworkably low densities and relatively high carbon emissions in comparison with international cities of similar sizes (Financial and Fiscal Commission, 2011). Given the complications of these interwoven and deeply entrenched problems, it was clear that the new government would need to review the country's existing planning laws, and promulgate new legislation specifically aimed at ameliorating their impacts.

To that end, the early years of the democratic era were marked by the introduction of a number of policies and national acts, each with an emphasis on addressing the effects of apartheid spatial planning. The most notable of these were the Reconstruction and Development Programme policy framework (Republic of South Africa, 1994) and the Development Facilitation Act, No. 67 of 1995. The Reconstruction and Development Programme focused on investment in basic services and infrastructure, and introduced a number of prominent spatial planning concepts such as 'more compact cities' and 'densi□cation and uni□cation of the urban fabric' (Du Plessis and Boonzaaier, 2015:92). Through the Development Facilitation Act, "the state formally committed itself to compaction policies" (Dewar, 2000:213). Chapter One of the act contains a set of eight General Principles for Land Development, one of which states that "policy, administrative practice and laws should promote efficient and integrated land development in that they...discourage the phenomenon of 'urban sprawl' in urban areas and contribute to the development of more compact towns and cities" (Republic of South Africa, 1995:8).

Policies and acts such as these show that the new government made a concerted effort to tackle the impacts of apartheid spatial planning and associated low density urban sprawl. They have been successful to the extent that since their adoption, the concepts of 'compaction' and 'densification' of urban form have been inextricably linked with the South African spatial planning doctrine (Du Plessis and Boonzaaier, 2015). At its birth, this new planning paradigm sought to radically transform the structure of South African cities, by rejecting "the low density, sprawling, fragmented and largely monofunctional forms of development that characterised the apartheid city" (Schoonraad, 2000:219).

Unfortunately, as bold as these policy and legislative intentions were, the apartheid city is still very much alive, and the country's various urban areas are "as segregated and fragmented as they were at the dawn of the democratic era" (Du Plessis and Boonzaaier, 2015:88). In fact, in many ways, urban development subsequent to 1994 has aggravated the spatial legacy of apartheid. As a result, the transformative effects of post-apartheid policy and legislation in restructuring South African cities are increasingly being questioned. Sadly, even when translated into legislation, the will to deconstruct the apartheid city along with its low-density sprawling patterns, has brought about very little change. It is now accepted that policy and legislative measures to change the inefficient patterns of South Africa's urban environments have failed (Financial and Fiscal Commission, 2011). What is also clear, is that top-down approaches do not have the vigour to bring

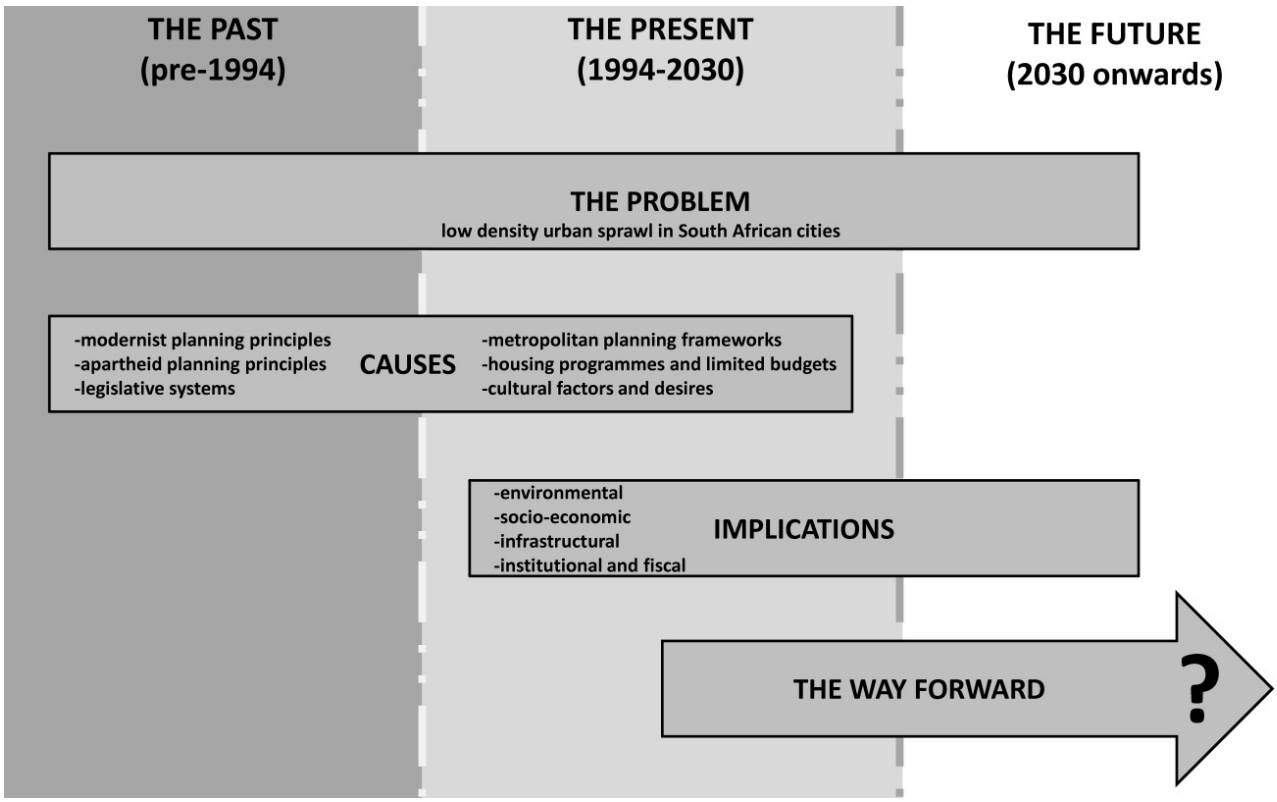

Figure 1: Idea-gram mapping the problem under review. The year 2030 refers to South Africa's current principal planning framework, namely the National Development Plan 2030.

about much needed transformation in the county's cities, especially when considering urban densities.

This paper begins with the understanding that what needs to be investigated is the root cause of urban sprawl which plagues South African cities. It is clear that planning frameworks and laws alone are wholly insufficient to densify and compact South Africa's urban areas, and steer urban growth towards a sustainable paradigm. This paper seeks to understand the powerful market forces driving urban growth in South Africa, and argues that these forces have been shaped by the cultural desires and aspirations of everyday people. The idea-gram below maps out the journey the paper takes, with each step being unpacked, focusing on understanding the cultural factors driving low density urban growth in South African cities. The paper is structured into four sections. Section 1 frames the problem of low density urban sprawl. Sections 2 and 3 identify the causes and implications of the problem. Section 4 outlines the cultural factors that contribute to the problem, while Section 5 directs the way forward.

SECTION 1: FRAMING THE PROBLEM OF LOW DENSITY URBAN SPRAWL IN THE GLOBAL CONTEXT

Before embarking on the journey to understand the causes of low density urban sprawl in South Africa's urban environments and the implications thereof, it is important to contextualise these cities in the international context. This is critical to gauge just how sprawling South African cities are, and to position them in relation to their global counterparts. The method used is quantitative, and draws on information from the American-based Demographia, which publishes an annual report using data from the United Nations as well as national statistics authorities (Demographia, 2016). The report surveys the 1022 global cities with populations greater or equal to 500,000 and provides population size, land area and density levels for each of these cities. Densities are measured in terms of the number of people per square kilometer, and are gross, not net. While this is by no means the best indicator of density levels, the report provides comparable information for cities across the globe, which otherwise may not have credible data readily available. In spite of the limitation, the report provides useful information to gauge density levels in global cities at a high level, and is sufficient to enable one to pick up on overall trends.

The Demographia data is interpreted in this paper using two forms of United Nations categorizations. The first divides the world's countries into 22 geographic regions, as defined in the World Urbanization Prospects: The 2014 Revision. For the

Figure 2: Demarcation of global regions. Authors' drawing generated from information in United Nations (2014).

purposes of this paper, some of the 22 regions have been clustered together, resulting in 14 regions which are shown in Figure 2. This has been done to categorize global cities into as few homogenous clusters as possible, such that they are both geographically as well as culturally defined (see Section 4). The second categorization used in this section of the paper, divides the world's cities into 4 classes based on population size, as defined in the same United Nations report. These classes are shown in Table 1, together with the number of each class of city there are in South Africa and across the globe. The table also indicates the average densities of each class for South Africa's cities and their global counterparts. The figures in this broad brush investigation reveal that South African cities across the four classes are significantly less dense than their global counterparts.

A further investigation was undertaken, with a view to understand how South African cities measure up when compared with cities located in each of the 14 global regions. For the purposes of simplification, megacities and large cities were clustered together, given that some of the 14 global regions do not have cities with populations greater than 10 million. The results of this investigation are shown in Table 2, and indicate that densities in Southern African cities are more similar to density levels in cities in Northern America, Western Europe and Oceania than cities in Asia, South America and other regions in Africa. This statement has two caveats. The first, is that of the 7 cities which are categorised under Southern Africa, all are located in South Africa. The second is that of the 7 cities which are categorised under Oceania, 6 are located in Australia. Thus, it can be deduced that densities in South African cities are more similar to density levels in Northern America, Western Europe and Australia than cities in the global South. Figure 3 indicates the average densities of cities per global region, and includes all 4 classes of cities. From Figure 3, one can get a sense of levels of urban density per global region across the various city classes. It is clear that irrespective of city class, South African urban areas are more or less as equally (not) dense as cities in the western world. Cities in Central and South America; the Caribbean; Eastern Europe; and Central and Eastern Asia tend to be denser. African cities outside of Southern Africa; and Western and South-Eastern Asian cities are denser still, with those in Southern Asia being

Table 1: City class and average densities (people per km2), rounded to the nearest 100. Authors' table generated from information in Demographia (2016) and United Nations (2014).

City Class	Population	Number in World	Average Density	Number in RSA	Average Density
Megacities	10 million or more	36	9,600	0	-
Large Cities	5 - 10 million	43	6,800	1	3,300
Medium-Sized Cities	1 - 5 million	430	7,500	4	3,400
Cities	500,000 - 1 million	513	6,800	2	2,500

	Megacities and Large Cities		Medium-Sized Cities		Cities	
	Number	Average Density	Number	Average Density	Number	Average Density
Northern America	10	1,600	39	1,100	37	900
Central America and Caribbean	1	9,800	22	5,300	21	4,200
South America	6	9,000	35	6,400	35	6,300
Southern Africa	1	3,300	4	3,400	2	2,500
Middle and Eastern Africa	2	13,300	19	11,400	24	9,100
Northern and Western Africa	4	6,800	30	9,300	34	7,900
Western Europe	5	3,900	32	3,300	51	3,400
Eastern Europe	2	3,500	21	3,800	36	4,300
Western Asia	3	7,800	31	8,300	30	9,600
Central Asia	0	-	3	2,500	7	4,200
Southern Asia	13	17,000	68	14,300	67	12,500
Eastern Asia	23	6,400	99	7,300	146	6,700
South-Eastern Asia	9	9,000	21	9,400	22	9,600
Oceania	0	-	6	1,500	1	900

Table 2: Average densities (people per km2), rounded to the nearest 100 for each of the 14 global regions. Authors' table generated from information in Demographia (2016) and United Nations (2014).

Figure 3: Average urban density by global region across city class, measured in people per km2. Authors' drawing generated from information in Demographia (2016) and United Nations (2014).

on average the densest in the world. What is clear is that South African cities do not follow the global South norm of being denser that their western counterparts.

In comparing average density per city class at the global level (as shown in Table 1) and at the regional level (as shown in Table 2), it is evident that the population size of a city does not always impact on density levels. At the global level, megacities represent the densest type of urban area, but medium-sized cities are on average denser than large cities. In six of the global regions, namely Northern America; Central America and the Caribbean; South America; Middle and Eastern Africa; Southern Asia; and Oceania, there is a positive correlation between the population size of a city and its population density, with the largest cities having the highest densities on average. In four of the global regions, namely Eastern Europe; Western Asia; Central Asia; and South-Eastern Asia, these variables are negatively correlated, with the smallest cities having the highest densities on average. In the case of the remaining four global regions, namely Southern Africa; Northern and Western Africa; Western Europe; and Eastern Asia, there is no discernible pattern between the population size of a city and its population density. These relationships (or lack of relationships) are important to note, as they indicate that for high densities to occur, cities do not necessarily need large populations. Conversely, lower population numbers are not a justification for cities having low densities. In reviewing South African cities in Demographia's list of 1022 cities in detail, it is clear that in spite of having reasonably large populations, densities are exceptionally low. Table 3 lists the seven largest South African cities, and shows a significant drop in global ranking for six of the cities, when comparing population size and density.

SECTION 2: CAUSES OF THE PROBLEM OF LOW DENSITY URBAN SPRAWL

The purpose of this section of the paper is to outline the myriad of factors which have driven and continue to drive low density sprawling urban development in South Africa. It is critical to note these factors, given that they have over time created the construct in the

City	Class	Population	World Rank	Density	World Rank
Johannesburg-East Rand	Large City	8,655,000	40	3,300	790
Cape Town	Medium-Sized City	3,865,000	107	4,700	620
Durban	Medium-Sized City	3,450,000	132	3,200	794
Pretoria	Medium-Sized City	3,030,000	154	2,500	865
Port Elizabeth	Medium-Sized City	1,225,000	404	3,200	805
Vereeniging	City	715,000	697	2,100	903
Bloemfontein	City	510,000	999	2,900	830

Table 3: Population and density data for South Africa's 7 largest cities. Authors' table generated from information in Demographia (2016) and United Nations (2014).

South African psyche of what cities and urban growth are, as opposed to how they could be. In other words, because these factors have had such longevity, low density sprawling development is seen as the norm, and in some ways, higher densities are considered to be somewhat of a foreign notion. The factors touched on in this section include modernist and apartheid planning systems, legislative systems, metropolitan planning frameworks, housing programmes and limited budgets. Although some of these factors had their heyday some decades in the past, their impacts still resound across South African cities today.

Dewar et al. (2012) argue that given that the vast majority of urban growth in South Africa has occurred subsequent to the 1940s, the bulk of development in the country has been based on modernist planning principles. Although having been conceived in the Western world, this ideology took hold in South Africa with tremendous vigour. The spatial implications of modernist planning principles in South African cities are manifold, and include the separation of land uses into mono-functional areas; the significant reliance on technology in the form of private motor cars, which have allowed for seemingly never-ending lateral urban expansion; and the decentralisation of employment and commercial services, strung together by freeways and roadways, such that they are only easily accessible for those with private motor cars. Moreover, the modernist ideology was based on the idea of the 'good urban life', and the single free-standing house on its own plot has become entrenched in the South African psyche as the pinnacle of success, and something which all people should aspire to. This is even in the case of the lowest income communities (Dewar, 2000). Given this phenomenon, the most dangerous principle of the modernist ideology in the long run, was arguably the creation of suburbia. In fact, low density suburban areas, often strung together by highway infrastructure, form the backbone of urban sprawl in South African cities.

Subsequent to the 1940s, and simultaneous with the implementation of modernist planning principles in South Africa, came the firm establishment of the apartheid state. This ideology of separate development, which was founded on spatial segregation propagated during the colonial era, was given potency by a host of national legislation. The principles of modernism worked exceedingly well with the construction of the apartheid city, with the national government of the time taking on the modernist model, which became "grotesquely distorted on a number of counts" (Dewar et al., 2012:4). For instance, the separation of land uses propagated by the modernist ideology was extended to include race-based separation, and very convenient for creating the apartheid city. The scale of this separation became magnified to a preposterous scale in the South African context, with non-white communities being moved long distances from places of employment and social opportunities. These people, who for the most part were poor, now had the furthest to travel, using large proportions of their household budgets on commutes (ibid, 2012).

Considering that South Africa's predominant town planning systems and policies have been almost entirely replicated based on urban management systems conceived in the Western world, it is unsurprising that the county's urban development has followed a similar low density and sprawling trajectory as cities in Northern America, Western Europe and Australia. Urban growth in South Africa has not only occurred against the backdrop of the country having been colonised by European powers between the 17th and 20th centuries, but has also been greatly influenced by the American system of zoning. Jacobs (1961) critiques the American Euclidian zoning system which in terms of the 1926 case law, upheld and entrenched the right to permit the separation of land uses through a legal system of land zonation. Of course, this system fitted perfectly with the idea of separation on the basis of race and class, and was aided by apartheid land laws, such as the Group Areas Act, No. 41 of 1950. It was this law which gave teeth to apartheid policies spatially, and enabled the separation of citizens into racially defined 'group areas'. Thus, South African cities started to experience the circumstance of separation and suburbanisation.

In addition to the historical factors which have driven low density urban sprawl in South Africa, there are several factors which continue to drive urban growth at the peripheries. Arguably, the most prominent of these is the cost of land. For instance, the bulk of low-cost residences in the country is provided by government, and largely located on the fringes of cities (Urban LandMark, 2011). A clear example of this is Durban's planned 5-year housing projects (eThekwini Municipality, 2014), the sheer volume of which are located alongside and even beyond the developed extremities of the city. In all South African cities, many parcels of urban land are in high demand, and are thus sought after by the more powerful sectors of the economy such as the retail and commercial markets. "Given the 'logic' of the market, poorer communities, and states acting on their behalf, are often unable to bid competitively

on valuable land" (Napier, 2008:1). In addition to the high costs of centrally located land, building costs are also a daunting barrier when considering the development of high density neighbourhoods. This is especially the case for low-cost government subsidised residential accommodation. For instance, at a meeting held in July 2015 regarding the development of a low-income area in Cape Town, it was noted that the cost of building a single two-bedroom apartment in a four floor walk-up, is equivalent to the construction costs of three subsidised free-standing houses. As such, the development of higher density living environments is not a financially feasible option for the public sector.

Additional factors to consider are population growth and rapid urbanisation. As identified in South Africa's most recent national census, the country's population grew from 40.6 million to 51.8 million in the fifteen year period between 1996 and 2011, a difference of 11.2 million people (Statistics South Africa, 2012). The latest general household survey estimates that there are now 54.4 million in the country, indicating that the country's population has grown by 2.6 million people in just 4 years (Statistics South Africa, 2015). The United Nations projects that South Africa's population will grow to 60 million people by 2030, and to 65.5 million by 2050 (United Nations, 2015). The sheer bulk of this growth will occur in urban areas. For instance, in 1990, 52% of the country's population lived in urban areas, increasing to 64% in 2014. This figure is projected to rise to 77% by 2050 (United Nations, 2014). As South African cities developed in response to rapid urbanisation (especially after the lifting of apartheid laws, which restricted the movement of non-white persons), the country's urban environments became increasingly sprawling and fragmented (Turok and Watson, 2001). Low density suburban housing is quicker and cheaper to develop, and if the current urban growth trends persist, South African cities are sure to become even more sprawling into the future. It is therefore critical that in the planning, building, development and management of South African cities, new ways of approaching the problem of low urban densities are considered, given that these spatial patterns exacerbate the impacts of social and economic inequality.

SECTION 3: IMPLICATIONS OF THE PROBLEM OF LOW DENSITY URBAN SPRAWL

This section of the paper briefly frames the consequences of low density sprawl in South African cities. Most of the standard implications of low density sprawl in cities elsewhere in the world hold in the case of South African urban areas, and include environmental; socioeconomic; infrastructural; and institutional and fiscal consequences. It is clear that modernist and apartheid planning principles worked hand-in hand to create low density urban sprawl and far-flung suburban areas on the peripheries of South African cities, which are effectively the homes of the vast majority of black urban inhabitants. However, in the post-apartheid era, the low density and sprawling apartheid city form has been perpetuated (Schoonraad, 2000). Du Plessis and Boonzaaier (2015) show that between 1994 and 2009, the most rapid physical growth in South Africa's four largest metropolitan areas (Johannesburg, Cape Town, Durban and Pretoria) has occurred at distances between 20km and 30km from the city centre. Growth at the periphery is overwhelmingly driven by short-term capital constraints, in spite of the fact that long-term financial costs are much greater in low density environments than more in compact ones (Financial and Fiscal Commission, 2011).

South Africa's low density and sprawling form of development "has driven roughshod over agricultural and wilderness landscapes, destroying potentially productive land and land of high amenity at an alarming rate" (Dewar et al., 2012:5). However, the severe ecological consequences of urban development are not limited to initial land conversion alone, and also extend to long term environmental implications. For instance, the Financial and Fiscal Commission (2011) uses development scenarios for a hypothetical South African city, and shows that the volume of carbon emissions is 22% higher in an 'urban sprawl' scenario, than in a 'compact city' scenario. In promoting urban efficiency, sustainability and resilience, it is clear that a more compact city structure, as opposed to the existing sprawling city structure, can greatly assist to not only bring people closer to urban opportunities but also integrate the South African city better and use urban land more efficiently. The study undertaken by the Financial and Fiscal Commission referred to above, concludes that the compact city has far more benefits than its inefficient sprawling counterpart. This is in respect of, among others, reduced capital expenditure on infrastructure; reduced travel distances; improved qualitative social and environmental benefits; and opportunities of increasing densities and supporting public transport investment in this way (Financial and Fiscal Commission, 2011). Table 4 uses information extracted from the study, and shows that South Africa's sprawling cities perform quite poorly in relation to their global counterparts.

	Population Density (persons per hectare)	Average Commuting Time (minutes per capita per commuter trip)	Average Trip Length (kilometres per person trip)	Carbon Footprint (tons of CO_2 per capita per annum)
Johannesburg	20.9	52		7 tons
Cape Town	12	50	15.9km	8 tons
Durban	14	45		6 tons
Pretoria	9.5	60		9 tons
Curitiba	57		7.5km	4.2 tons per light vehicle
Ahmedabad	134	20	5.5km	0.05 tons
Bangalore	207		9km	0.12 tons
Addis Ababa	560.8	62	10km	

Table 4: Efficiency comparisons of South African cities with their global counterparts. Authors' table regenerated from information in Financial and Fiscal Commission (2011).

Clearly, South African urban areas are largely inefficient when compared to international cities. These inefficiencies are the combined result of low density sprawl and highly unequal land distribution patterns. Angel et al. (2011) argues that the sprawling city has a number of manifestations, all of which are applicable to South African cities. These manifestations include "endless cities, low densities, fuzzy boundaries between city and countryside, a polycentric urban structure, decentralised employment, single-use rather than mixed use urban expanses, ribbons and commercial strips, scattered development, and the fragmentation of open space" (Angel et al., 2011:6). Furthermore, the sprawling nature of South African cities make the large distances from the fringes to central areas wholly unworkable. An example of this is the costly, difficult and inefficient connection of dwellings on the periphery to municipal infrastructural systems, a problem compounded by the impacts of South Africa's historically low investment in infrastructure (Financial and Fiscal Commission, 2011).

The low density and sprawling patterns of South Africa's cities are dependent on an oil-based economy, generating gargantuan amounts of movement, with densities too low to support an efficient and well-connected public transportation system. As a result, many South African cities are not well-connected in terms of public transportation; rail and taxi services are often infrequent, late or no shows; and 20 years after democracy, Bus Rapid Transit systems are only now getting off the ground. However, for those for whom private vehicles are too costly to purchase and operate, taking public transportation is the only option. Where public transportation is present, it is at such a high cost, that the poorest of the city must spend one of the largest proportions of their money on transportation commutes. More than 50% of poor urban residents spend more than 20% of their declared household income on transport (Kane, 2006). As a result, many of the urban poor remain trapped on the edge of the city, far removed from the opportunities of urban life, public facilities and services, and economic prospects.

For the growing middle-income group, poor public transportation services (as a direct result of low urban densities) have given rise to high levels of private motor vehicle ownership. As at 31 May 2016, there were 9,957,012 registered private vehicles in South Africa (excluding heavy logistics vehicles), compared to only 60,298 busses and 302,604 minibus taxis (ENATIS, 2016). This means that for every bus or minibus taxi in the country, there are 27 private motor vehicles. This situation has been aided by the fact that South Africa has one of the cheapest gasoline prices in the world, falling into the first tertile (Global Petrol Prices, 2016). The large numbers of private vehicles in South Africa contribute not only to immense amounts of greenhouse gas emissions, but also heavy traffic congestion. In order to tackle such challenges, South African cities must work towards becoming public-transport orientated, which is only a possibility if higher densities are pursued (Dewar et al., 2012).

The implications of low density urban environments for the inhabitants of South African cities are manifold, and certainly do not impact on all individuals equally. However, it is our assertion that the biggest consequence of low density urban sprawl is that is has changed South African culture and fundamentally altered perceptions of what cities should be. The culture of living in the suburbs (whether they be high or low income areas) and travelling long distances to work is an everyday reality. In the following section, we argue that this paradigm of living in sprawl is an automatic response for many South Africans, regardless of income.

SECTION 4: CULTURAL FACTORS COMPOUNDING THE PROBLEM OF LOW DENSITY URBAN SPRAWL

As discussed in this paper, the bulk of development in South African cities since 1994 has contributed to urban sprawl. This has been in spite of the fact that since the transition of South Africa to a democratic state, the country's planning doctrine has been

geared to address this significant issue. Regardless of their good intentions, no policy framework or law has proven to be stronger than the will of the market. South Africa's current principal planning framework, the National Development Plan 2030, recognizes the need to increase urban densities in order to support public transport and reduce sprawl (Republic of South Africa, 2012). However, given the failures of planning policy in bringing about meaningful change to South African cities since 1994, it is highly unlikely that even the country's principal planning framework will have the teeth to steer the market towards increasing urban densities. A large factor in this is that the market is not driven by built environment professionals, but rather by private developers and property purchasers who influence the form of urban growth.

Because of the country's great social, linguistic, economic, racial and religious diversity, among others, the types of cultural factors which impact on the urban form of South African cities are wide and varied. The common denominator, however, is that these cultural factors tend to influence development towards the peripheries of cities in a low-density sprawling manner, rather than inwards in a more compact fashion. This section of the paper uses the terms 'cultural desires' and 'cultural aspirations'. Cultural desires refer to what urban inhabitants need today, in order to facilitate a comfortable living environment, in a manner which suits the lifestyles required to support their families both economically as well as culturally. Cultural aspirations refer to what people want to have in the future, in a manner which suits their cultural goals, and is often influenced by life stage.

An example of people with cultural desires which influence the form of cities, is low-income migrants who move from rural areas to the peripheries of cities. At the urban periphery, they are close enough to the CBD or other nodes to enjoy some of the benefits of urbanity, while at the same time far enough removed from central parts of the city, to enable them to enjoy some aspects of rurality. These peri-urban environments enable these migrants to continue to lead the type of lifestyle they are more familiar with, and thus facilitate a comfortable living environment. At the edge of the city, where land is cheap, they are able to have some access to space for subsistence farming in the form of crops and livestock. Examples are Khayelitsha and Mfuleni along the N2 highway in Cape Town, where it is not unusual for vehicles on the highway to stop and wait for cattle to cross over. Similar occurrences are common in Umgababa along the N2 highway in Durban, but perhaps more frequently. Schoonraad (2000) shows that the urban poor cannot afford to live in more dense environments, and thus often choose to live at the periphery out of necessity. This is in spite of the fact that living at the edge of the city results in increased traveling costs. As a survival mechanism, many families prefer to live in peri-urban areas, sending one family member into town to work, while the rest undertake informal work at home. "Through the reduction in daily living costs, made possible by living in a semi-rural area, they could survive on one formal sector salary" (Schoonraad, 2000:224). Had they lived closer to the city centre in a denser environment, this would not have been possible.

A further example of people with cultural desires which influence the form of cities, is middle-income small-business owners, who run their enterprises out of their homes. These people undertake a range of jobs, ranging from services to retail and light-scale manufacturing, often without official approval for such activities. Because these people operate their businesses from home, space is needed for both living, as well as for the business itself. In some cases, this takes the form of converting a bedroom, lounge or garage to meet the needs of the business. In other cases, this takes the form of using an entire floor of the house, building a new structure on the plot, or using the full extent of the front or backyard. Durban's Indian suburbs serve as rich examples of these activities. Within a single neighbourhood, it is not unusual to find home-operated businesses including, among others, convenience shops and greengrocers; enterprises specialising in Indian food items, spice production and tailoring; retailers selling traditional clothing; and motorcar mechanics. Clearly, this would not be possible in more dense environments, due to both space and cost constraints.

Cultural desires are in some ways more tangible than cultural aspirations. This is due to temporal reasons, with the former happening in 'the now', while the latter happens in the future, and is a state which is aspired to. Although influenced by varying factors, cultural aspirations in the South African context generally amount to the vast majority of urban inhabitants wanting to own large houses on their own plots of land. This state is very much embedded in the South African psyche, and differs from cultural desires, which are partially based on the socioeconomic benefits enabled through living on larger plots of land. Many South Africans have historically had a tense relationship with areas of higher densities. For instance, when displacements

of black people from the inner city into far flung suburbs occurred in terms of the Group Areas Act in the 1960s, a large number of people were moved into public housing estates. While these planned estates comprised a mix of housing types, many of them took the form of three to four storey walk-ups arranged in apartment blocks. These blocks were designed in such a manner, that their surrounding environments were undesirable to the inhabitants, and often referred to as slums. Thus, the perception of apartments among the majority of public housing beneficiaries was not only tainted by their form, but also their location in monofunctional residential suburbs far away from access to urban opportunities.

Schoonraad (2000) argues that a reason behind the aversion to higher densities in the country is the lack of medium to high density mixed-use developments that can serve as exemplars of what it means to live in a compact city. In fact, in all South African cities, the densest areas are informal settlements and lower-income black townships. As such, there is a binary in the country, in which wealth is associated with large houses and plots of land, and poverty is associated with dense urban environments and smaller living quarters. Thus, for many individuals, higher density urban areas are considered to be less desirable than the single freestanding house on its own plot. Napier (1998) documents the outcomes of a housing survey, which shows that the vast majority of residents consulted, chose a larger house and plot with inferior services over a smaller plot with a better quality house. Schoonraad (2000:227), states that "in a survey of squatters on the outskirts of Pretoria, 95% chose detached houses and 5% high-rise flats as the preferred type". NM & Associates et al. (2006) document the outcomes of stakeholder engagement processes with families who were evicted from the District 6 area of Cape Town under the Group Areas Act. In discussions around the restitution of land and the construction of new homes, these claimants made it clear that three-storey walk-ups were not desirable to them. Again, the term 'slum' was used to refer to the development of higher density areas, which the claimants felt would result in high levels of crime. A resident survey undertaken by the City of Cape Town (2005) shows that there is the common perception that higher density environments are of a low quality, poorly maintained, and riddled with crime and anti-social behaviour. From these studies, it is clear that the number of people who choose to live in freestanding houses far outweighs the number of people who prefer to live in higher density environments. South Africa's latest general household survey shows that there are 10,177,000 freestanding houses in the country, compared with just 640,000 apartments; 83,000 cluster houses in complexes; 245,000 semi-detached houses; and 259,000 semi-detached townhouses in complexes (Statistics South Africa, 2015). This means that for every higher density dwelling in the country, there are 8.3 free standing houses on their own plots.

In the South African context, individuals in the emerging and realised middle income groups, tend to buy increasingly larger residential properties as soon as they have the income to afford a larger mortgage bond. This is done instantly, automatically, without much forethought regarding the implications, to the extent that it has over time become a part of South African culture. In many ways, the American dream has been adopted by many South Africans, intent on pursuing their aspirations to live in large free standing houses on their own land parcels, rather than in denser, more convenient, and more compact environments. The dream is reminiscent of a 1950s American advertisement for Hoover or Cadillac, and centres on the nuclear family: 1 man, 1 woman, 2 children, 1 dog, 1 cat and 2.5 bathrooms. This residential typology multiplied many times over, has given rise to vast landscapes of repetitive, monotonous, freestanding single-storey residential units - American South African Suburbia. As discussed earlier in the paper, this low density sprawling form of development has resulted in the take up of well-located land across the city, to the extent that urban land to accommodate South African city growth, is scarce.

For the middle income and affluent groups, a part of this paradigm appears to be influenced by 'keeping up with the Jonses' mentality, a situation in which owning a large house and property gives one certain bragging rights. Clearly, large houses are a status symbol, especially when they have more rooms than one actually needs. The seas of cookie-cutter McMansions in the wealthier areas of South African cities show no signs of turning the tide, with Tuscan villas in Johannesburg and Balinese styled mansions in Durban's northern suburbs, increasingly on the rise. Arbury (2005) argues that one of the benefits of urban sprawl is that one is able to live in a large house on a large plot of land, and as such suburbanization is a powerful celebration of individual freedom and wealth. He notes that living in this manner are signs of success in Northern America and Australia. In the research for this paper, a number of online articles were sourced, in order to flesh out Arbury's position, and specifically

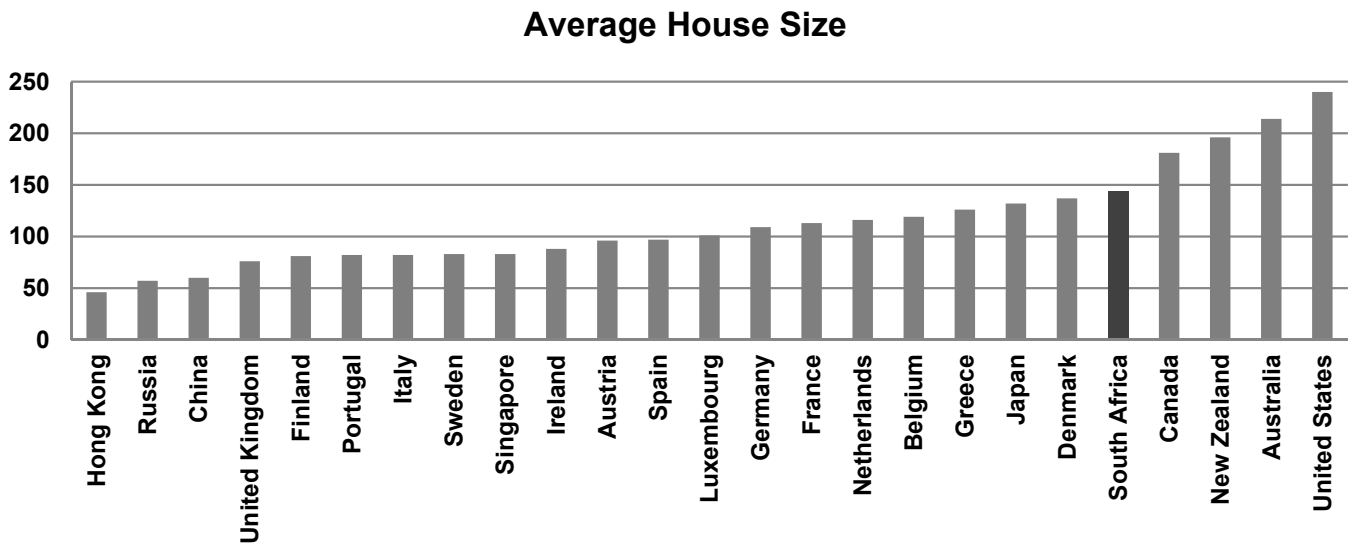

Figure 4: Investigation into the average size of new houses. Authors' chart generated from information in Demographia (2005); Demographia (2014); Statistics South Africa (2016); and Wilson (2013).

to answer the question of why some people in the Western world aspire to live in large houses. While the articles themselves were not particularly useful, the user comments at the end provided some useful insight into why individuals in the West support the low density sprawling urban form that goes along with large residential properties in the suburbs. What makes this information useful, is that these comments were not written by planners, academics or built environment specialists, but rather by the typical home buyer. Three of these user comments are shared below, with the acceptance that they hold true for a number of South Africans. James Geddes (2013) argues that "it is a learned cultural thing...if it is a custom in a society, tied into socio-economic status then people will aspire for the best status, with greatest area". In another post, a user identified only by the name 'DDD' (2013) states that "Australia has a fascination with bigger. Big country, big cars, big houses and ever increasing waistlines - quite like America I guess". 'Ray' (2010) states that "Americans think small homes are low status and I don't see that changing anytime soon no matter how good it is for the planet". While these perceived cultural trends may have been written with parts of the Western world in mind, we argue that they have applicability in the South African context.

An investigation into the average house size across the globe has the potential to quantitatively show that South Africans, like their western counterparts, are afflicted by the aspiration to live in large houses. Statistics South Africa (2016) shows that 39,764 building plans were approved by local authorities in 2015. The total building area approved was 5,710,616 square meters, resulting in an average house size of 144m2 for newly approved residential plans. This number is compared to the average size of new houses in 24 countries, as shown in Figure 4. The graph indicates that the figure of 144m2 is the fifth highest in the study, after the United States, Australia, New Zealand and Canada.

As a result of cultural influences, South African cities have relatively low urban densities. Cape Town, for example, has a gross base density, measured against urban built area alone, of 10 to 13 dwelling units per hectare (City of Cape Town, 2012). This equates to approximately 4,000 to 5,200 people per km2. To achieve the good city, Cape Town requires at the very least a gross base density of 25 dwelling units per hectare (City of Cape Town, 2012) or 10,000 people per km2. Against this background, it can be argued that densification can play a major role to improve Cape Town's sustainability in terms of urban form, spatial patterns and the quality of life of the majority of its citizens.

The similarity in South African house sizes with those of their developed western counterparts, together with the similarity in urban densities in these regions discussed earlier in this paper, bring to mind a recent interview with Moeletsi Mbeki (2015). In the interview, he stated that "We always forget that South Africa was created by the British... You should never forget that we were colonised by one of the most powerful countries and economies in the world at the time. So South Africa, like the United States by the way, was shaped by the United Kingdom" (Mbeki, 2015). It is clear that western culture has fundamentally shaped the urban form of South African cities. The following section of the paper makes the argument that in order for South

Africa's urban areas to transform, inspiration must be drawn from the global South.

SECTION 5: THE WAY FORWARD

Given the problem of low density urban sprawl in South African cities as a result of western influences, the questions that arise are to what extent should South African cities take their inspiration from cities of the global South, and which cities are the best examples to follow? Twenty two years into our democracy, we have still not created what Friedmann (2000) refers to as the 'good city' for all. In his explorations of the good city and assets-based approach, Friedmann (1992; 2000; and 2006) recognizes the need to create human wealth, both spiritually and culturally, and to capture positive tangible assets, the basic fundamental needs towards building sustainable and socially just cities, where people and their livelihoods are the central focus. Primary components focus on appropriate housing with secure tenure (including access to land opportunities) and essential services; educational institutions; access to good health; safe, efficient and reliable public transportation; and employment opportunities (both formal and informal). "The satisfaction of these tangible, material needs constitutes the foundation for our most fundamental right, the right to life" (Friedmann, 2006:4). The spatial expression of the good city is often supported in the compact city form (Irurah and Boshoff, 2003), where densities play a key role.

South African cities are never going to be as dense as Mumbai or Tokyo, for example, nor should they be, as drawing inspiration from cities in the global South is not about density for density's sake. Rather, it is about urban densities to enable the good and sustainable city over time; institutional and public willingness to embrace densification as a tool for achieving the good city; and not holding on to the American dream of the culture of suburbanisation. Examples that South African cities may therefore want to follow include Singapore and Curitiba, given their city investment programmes and interventions that had to do with both quantitative densities and qualitative measures to achieve elements of the good city. For instance, both cities arrested their unemployment conditions through investment in public transport integrated with land use planning measures and densification (Mammon and Ewing, 2006).

CONCLUSION

This paper has shown that cultural aspirations have an enormous impact on how South African urban areas grow, and the form that this growth takes. The implications of low density urban sprawl will continue to persist into the future and have detrimental outcomes for future generations if the root causes of this problem are not addressed. In order for South African cities to change course, the negative perceptions that urban inhabitants have of higher density environments need to change. Clearly, this is an enormous feat, and such deeply embedded perceptions will not change overnight. Good quality higher density urban environments need to be developed as an alternative living model which shows urban inhabitants that the South African dream can be about living well, in a manner that allows the city to thrive.

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Temporality and limits to hospitality in the ruins of a world heritage (renewal) site: Suleymaniye on the Istanbul Historic Peninsula

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The paper introduces Suleymaniye on the Istanbul Historic Peninsula to discuss the spatial and social consequences of renewal policies within the framework of the temporality discourse and to question the ways in which urban politics can respond to the problematic of hospitality, while highlighting the sociality formed by undesirables.

INTRODUCTION

Istanbul, today, is confronted by change through an extremely destructive restructurisation. This is the result of the political conflict being waged on urban space and around issues of temporality vs. permanence, ottoman vs. republic, insiders vs. outsiders, hosts vs. guests, owners vs. invaders. The demand for the creation of a 'new' past for a 'new' 'glorified' future by the Justice and Development Party (AKP) is being realised through the power of space, while bringing the familiar interface of empowerment that represents the epitome of the desire to destroy all that is left of the unwanted past. Urban renewal, in that sense, appears as the key instrument in the restructuring of the city, creating an illusive arena of socio-spatial segregation through the emerging spaces of decay and privilege, and the emerging groups of poverty and wealth. In Suleymaniye, this means a 'world heritage (renewal) site'.

Suleymaniye is currently fighting for its right to survive against destructive state-led urban renewal interventions. The remnants of the demolished and burned-out residential buildings, which were once the reason for Suleymaniye's inclusion on the UNESCO World Heritage List, are home to spatial concentrations of disadvantaged residents, as well as the hidden survivors of the Syrian conflict. Urban renewal has had many controversial visible and invisible impacts on Suleymaniye since 2006, and after its declaration as a renewal site. The local community, who have been declared invaders or undesirables by the governmental policies, have been forced to sell their properties to municipal agencies; leaving Suleymaniye's historic urban landscape at the frontier of another and bigger challenge. The sociality formed by the old Suleymaniye community has been disappearing, and a new urbanite class is being born. The questions covering the future of this unique World Heritage site, now under construction, cover issues of preservation, renewal, and the right to the city. Thus, this paper focuses on the spatial and social consequences of renewal policies within the framework of the temporality discourse as an attempt to question the ways in which urban politics can respond to the problematic issue of hospitality.

THE TEMPORARY CITY

While the world has been mesmerised by international conflict, especially those in the Middle East, the 'temporality' of our cities, and therefore our heritage and heritage communities, has become a prime subject for news agencies, policy makers and scholars. We have been witnessing the destruction just as the one wrought in Palmyra and Damascus, all of which have resulted in the destruction of heritage, the erasure of memories, and the disappearance of the tangible and intangible values of human existence. This loss has been seen as inevitable, notably when the destruction arises from 'natural' disasters such as the Kathmandu Earthquake of 2015. However, such losses has shown their destructive path in the form of 'unnatural', just as the man-made disasters brought about by the so-called neoliberal restructuring of cities in the name of renewal. Some instances of this destruction have been valued more than others, and sometimes the loss of physical remnants have occupied the news far more than the loss of human values. However, they have all become visible marks that reveal our urge to claim permanent existence in a temporary setting that is continuously reshaped through the everyday politics of the present. One can say that temporality is the actual reality in the formation of

cities, and that a city is, in fact, the historic layering of cultural, natural, social values and attributes; open to change and evolution, yet eager to identify itself through continuity.

'Temporality' becomes more apparent when constructing a perspective of the 'historic' city itself. According to Harvey (2001), every society has had a relationship with its past, even those that have chosen to ignore it, and it is through understanding the meaning and nature of what people tell each other about their past; about what they forget, remember, memorialise or fake. Thus, in the long-span of history, every society is eventually bridged within a temporal framework, and this temporal relationship takes the form of heritage. Thus, heritage is more about the present than the past (Huyssen, 2003). In essence, it gives a feeling of continuity; this continuity defines a permanent yet temporary existence in spite of changing rationales; ideologies, ethics, demands, tools, and authorities. Today more than ever, heritage is subject to temporality as the demands of the present are increasingly in conflict with those of the past. Nowhere is this more apparent than in policies of renewal that have been twisted at the hands of overwhelmingly zero-tolerant authority.

Urban renewal can be defined as an attempt or intervention to create a sudden, direct, planned, systematised 'cease' in the history of cities, and in their continuity. Evoking negative references, it is always associated with destruction, complete replacement, relocation, community dissolution and segregation. The rationales have changed over time and according to region. They have ranged from the quest for better cities through sanitation projects or park movements during industrial revolution of the 19th century to the modernist movement of the 1930s and the post-war restructuring that occurred after the World Wars. The 1940s and 1950s saw the institutionalisation of urban renewal as an attempt to create an economic revival and the development of cities with a nasty twist. However, there was a less pleasant element that soon began to make its presence felt. This was the start of a period when renewal gained connotations with 'unfitness', 'cancerous growth' together with 'beautification', 'valuation' and 'prestige'. While the planning profession has become something "where everything could be measured in terms of time and money, and against equity and intangibles" (Hall, 1989: 279), it has continued to ignore the heavy psychological cost of enforced relocations and the social cost of the destruction of communities as best described in Jacobs' The Death and Life of Great American Cities (1961). For Istanbul, the historic temporary city, urban renewal is the process during which "the discursively constructed 'planet earth' becomes a reality" (King, 2004: 3).

ISTANBUL: THE PERMANENT TEMPORARY CITY

Istanbul is a city with a history that goes back more than 8000 years. However, it is in fact the ultimate temporary city, a status that is visible both in its urban fabric and its urban community. The temporality of Istanbul has become part of the public realm by the ongoing destruction and reconstruction process before our eyes through the everyday politics of the present. A detailed conceptualisation of the evolution of urban renewal in Turkey with reference to mainstream politics can be found in Gunay et al. (2015). The heritage, the memories, the tangible and intangible values of the communities have become targets for the destructive politics that lurk under the mainstream. It was either in the name of the modernity project of the 1950s or the global vision of the 1980s or the neoliberal urbanism of the 2000s. From a wider perspective, there has always been conflict between temporality vs. permanence, ottoman vs. republic, insiders vs. outsiders, hosts vs. guests, owners vs. invaders, and this conflict has implications for the everyday life of Istanbul.

'Conquest' is a catchy term to define this conflict. Even though Istanbul was conquered by the Ottomans in 1453, it is surely ironic that the 'conquest' is still on the political agenda. The use of conquest is somehow shows that Istanbul as we know it will 'again' come to end, or may show the state's own insecurity regarding its permanence. Following the first conquest in 1453, the second 'conquest' of the city took place in the 1950s, and the word was first used in this new context by Adnan Menderes, the Prime Minister and leader of the Democrat Party (DP), the party which came into power after twenty-seven years of one-party rule by the Republican People's Party (CHP). While the DP declared "we are going to rescue her (Istanbul) from the gaze of the 1900s" (see Akpinar, 2010) as election propaganda, urban renewal, based on a wave of demolition, had already become a key strategy for the conquerer. The motto of 'beautifying Istanbul' and 'glorifying Istanbul's Ottoman past' was realised through the opening of new transportation arteries and the demolition of the historic neighbourhoods surrounding major monuments. Menderes was even given an honorary mayorship of Istanbul and installed as the head architect of the city. The head architect's vision resulted in the demolition of nearly 7000 buildings (Akpinar, 2010). This 'temporality'

came to an end with the arrest and execution of Menderes following the military coup in 1960.

Istanbul was conquered for a third time in the 2000s, this time by the AKP and the former Prime Minister and current President Recep Tayyip Erdogan (who was actually also the first 'Islamist' Mayor of Istanbul in the 1990s for the Welfare Party - RP). Once more, the historic city has seen construction to remove the obstacles confronting a global and modern city undertaken and justified with familiar mottos; 'unfitness', 'unhealthy', 'cancerous cells', 'shamebag' or 'dirt'. Urban renewal has been re-introduced as the basis for a wealth of urbanisation policies and planning agendas via a growing tendency towards neoliberal urbanisation centered around privatisation and expropriation. The 21st century's Istanbul has been a showcase for increasing competitiveness in the global market through the reproduction of marketable enclaves for upper income groups and foreign guests (see Kuyucu and Unsal, 2010; Bartu-Candan and Kulluoglu, 2008; Lovering and Turkmen, 2011). These renewal schemes, which have been employed in attempts to resolve the ill-functioning urbanisation problem, have eventually turned into instruments of 'urbicide' in Istanbul, and have been used to produce a political 'evolving' model of urban destruction (Gunay, 2013, 2015a).

Being continuously restructured through the reclamation and imposition of diverse ideologies, Istanbul is always in a temporary setting, and is being continuously reshaped through the everyday politics of the present. Looking at the city through the eyes of its citizens, it is not wrong to say that nothing is permanent, neither its urban fabric nor its communities. This is part of the enthusiasm to create a new 'glorified' identity with an associated representational space that is based on a 'mythical' past. The reclamation policies of the AKP are based on the so-called new Ottomanism blended with Turkic-Islamist figures and are constructed, mainly by bulldozers, upon the unconscious use and commodification of urban space, such as in the façadisation of public buildings and housing projects as part of heritageisation, the transformation of city symbols into religious figures, as in the reconstruction of destroyed religious buildings (see for instance, Oncu, 2007). This is also reflected in the use of the city's historic monuments, and marks a return to a glorified but mythical Ottoman era that denies Istanbul's multi-cultural, multi-identity 8000-year history. This shows that 'reclaimed' not only applies to the physical, but also the controversial and kitch lifestyle of the new urbanites within a city that has become a continuous battleground between the permanent and the temporary. It is a controversy or an irony that both of these new conquests, which were made by conservatives intent on paying homage to the Ottoman Empire by eliminating traces of the Republic, used the city and its monuments to visualise their ideals, and, in reference to Lefebvre (1991), to create their representational space. However, the historic urban landscapes, the most noticeable mnemonics of the glorified past have initially become the target: 'real' Ottoman heritage is demolished to make way for the construction of heritageised 'fake' environments. In this sense, it is important to remember Ekinci's (2009) words: the 'conservative' AKP is accelerating a non-conservative policy of urban values. Thus, the ideal of bringing a permanent end to the temporary conquest of the Republic also highlights the temporality of the desired conquest. The following sections will discuss these struggles through the Suleymaniye case by focusing on two inter-linked processes of temporality: heritage and the heritage community.

SULEYMANIYE: A RENEWED WORLD HERITAGE SITE

The Istanbul Historic Peninsula has been a target for central and local authorities since the 1950s as an illustrative example of how the socio-political needs and ideals of a certain period play a role in the reconstruction of the past. From the DP of the 1950s to the AKP of the 2000s, it has acted as a stage for the visualisation of particular identities on urban space, namely, an idealized space of a large and powerful Ottoman power enclave. Suleymaniye is just one of these stages.

Suleymaniye is a reflection of the so-called outstanding heritage value in the pinnacle of Ottoman architecture occurred in the 16th century. The Suleymaniye Mosque, which gave its name to the locality, is among the finest examples of Islamic Architecture, and was built by Architect Sinan between 1550 and 1557. Together with its associated neighbourhoods, it was declared as a protected urban site in 1977 (Board of Protection Decision No. 9776/ 09.04.1977), and was included on the UNESCO World Heritage List of 1985 together with three other areas of the Historic Peninsula (the Archaeological Park of Sultanahmet, Zeyrek Mosque and the associated conservation area, and the Land walls). Whereas the Historic Peninsula has been associated with distinguished phases of human history continuously for 8000 years, Suleymaniye represents a unique testimony to Ottoman civilisation and provides exceptional evidence of the

late Ottoman urban pattern (UNESCO/WHC, 1985). However, this 'distinguished evidence of human history' has continuously been at the mercy of destructive forces since the 1950s.

The quarter (semt) was a place where the rich and elegant society of Ottoman administrative class and muslim clergy (ulema) together with wealthy Greek and Jewish communities lived during the 16th and 17th centuries. This is visible in both examples of ensembles of palaces and religious complexes and also in the urban pattern and its associated vernacular architecture as the symbols of the golden age of the Ottoman Empire. In the 19th century, the social pattern started to change through the movement of wealthier groups to the new commercial centres of Karakoy and Beyoglu and to resorts along the Bosphorus strait. As shown in the research conducted in 2003 by the author (see Gulersoy-Zeren et al. 2008), the quarter was restructured both spatially and socio-economically after the 1950s by the influence of immigrants from the eastern regions of Turkey, mainly from Southeast Anatolia and the Black Sea regions. Regarding the ambition of increased industrialisation and modernity under question, manufacturing and wholesale areas have been developed alongside Istanbul's traditional trading centre: Eminonu. The 1980s was no different. While the peninsula had become a 'transit region' since the 1950s' political conjuncture, large-scale migratory movements saw Suleymaniye to become one of the first ports-of-call for new migrants seeking their fortunes in a city where 'land is gold', as one traditional idiom states. Thus, it was transformed into a temporary shelter and a temporary workplace with permanent marks of decay.

This temporality began a new phase in 2005. 2005 was the year when the Law on the Protection and the Revitalisation of Deteriorated Historical and Cultural Immovable Assets through Renovation and Regeneration (Law No. 5366, Official Gazette no. 25866, 05.07.2005) was enacted by the AKP. This was an attempt to bypass the Law on the Protection of Cultural and Natural Assets (No. 2863/23.07.1983) in order to redefine the institutional responsibility areas and intervention models in historic urban landscapes in the favour of the private sector and the corporate power that reflected the state ideology (see Gunay et al., 2015; Gunay, 2015a). Although the law was justified in terms of its consolidation of the urban structure for earthquake risk mitigation and the regeneration of decaying neighbourhoods in historic city centres, it eventually propounded 'renewal sites' in existing and nationally registered 'conservation sites'.

Following the enactment of Law no. 5366 in 2005, urban renewal site decisions for all eight neighbourhoods of Suleymaniye were taken in 2006 (Ministerial Board Decision No. 26206/22.6.2006); and a renewal project covering its 4 neighbourhoods (Demirtas, Hocagiyaseddin, Hacikadin and Yavuzsinan) was made public by Fatih Municipality. The stated aim of the project was to redefine Istanbul as a city that conserves historical and cultural values, to create a positive and attractive city, and to provide a sustainable and liveable urban settlement that is resistant to natural disasters and that conserves the architectural fabric (Fatih Municipality, 2011). As with other renewal projects, the "glorification of Istanbul's ancient history along with its aesthetic preservation" became the key propaganda element (Oncu, 2007: 235). For the empowerment of AKP ideology, Suleymaniye has provided a perfect setting through the glory of Ottoman masterpiece, its religious outpost, and its distinctive vernacular architecture. However, this has not stopped the authorities from planning the destruction of 2800 buildings covering an area of 348,000 m2. According to the Historic Peninsula Management Plan (2009), there were 960 listed structures, 466 of which were monuments in Suleymaniye. The first stage even included 427 nationally listed buildings (see UNESCO/WHC, 2012). Within the ten years of the declaration of the project, Suleymaniye has been transformed into a huge construction site. The Istanbul Housing Construction Industry and Commerce Corporation (KIPTAS), an agency of the Greater Istanbul Municipality, played a major role in the implementation as both project developer and property owner. So far, KIPTAS has bought approximately 200 properties in Suleymaniye, most of which were demolished to ironically perform 'restoration projects'. The ones that have not yet been demolished were evacuated, largely in the hope that they will collapse due to lack of maintenance, as a continuation of the Ottomanisation of the peninsula's heritage. The project was halted in 2012 due to lack of financial funds and a failure to successfully negotiate with remaining property owners, but started again in 2015. Thus, the heritage that was promoted to symbolise the unique attractions of Istanbul as a global city with a glorified past has become subject to contested memories, dislocations and serial demolitions (Oncu, 2007).

SULEYMANIYE AS A TEMPORARY ENCLAVE

The remnants of the demolished and burned-out residential buildings, which were once the reason for Suleymaniye's inclusion on the UNESCO World Heritage List are symbols of the fight for survival against destructive state-led urban renewal interventions based on gentrification that re-produce enclaves of urban poverty, polarization and segregation. Today, they house spatial concentrations of disadvantaged residents. This community, who have been declared 'invaders' or 'undesirables' according to AKP policies, have been forced to leave or to sell their properties to KIPTAS. KIPTAS became the area's principal property owner as a consequence of the speculative purchase of more than 200 properties that were bought before the enactment of the renewal law. The majority of these properties have been left to decay or were demolished. The enforcement and encouragement of dispossession through 'urgent expropriation' (Ministerial Decision No. 10501/24.05.2006) has proved to be an important instrument in reclaiming power in the neighbourhood through involuntary evictions in support of the speculative redefinition of ownership patterns. The headman (muhtar) of the Suleymaniye Hacigiyaseddin neighbourhood states that there was no official contact with the community. The municipality asked them either to conserve their properties or sell them. The first families who sold their properties were paid €324 per m2 (Birgun, 2010), however the value of similar properties reached €950-1600 per m2 in 2014 (see Revenue Administration, 2014). There have also been fires that have left families homeless. The sociality formed by the old Suleymaniye residents has been disappearing, and a new urbanite class is being created. As a result of the continuing renewal project, more than half of the properties have changed ownership, causing the formation of 'ghetto-like' concentrated zones of poverty and exclusion.

The UNESCO Project in 2003 (in which the author participated) give important insights into the sociality of the quarter before the renewal project began (see Gulersoy et al. 2008). The residents were of migrant families from economically underdeveloped regions of Turkey, of the 100 families interviewed, only 38% of the population was born in Istanbul and 52.5% had been living in the quarter for less than five years. Within the profile of extended families of more than 5 people (63%), 31.6% of mothers and 17% of fathers had no education, 19.2% of the fathers had no income, while those with a monthly income were mostly self-employed or peddlers. Thus, the monthly incomes of the residents were low, the ratio of fathers having a monthly income of less than €225 was 33%. 73% of the residents were tenants. Having a history that goes as far back as the 15th century, 'bachelor dwellings' (see Kizilkan, 2009), where more than 7-8 men with very low incomes live together in single rooms, are the most prominent visible signs of mobility and temporality.

Although living conditions were harsh, it was a place that offered low rents to a vulnerable community. In Suleymaniye, as in other quarters which have been subject to state-led gentrification, has historically had a spatially concentrated social network; it was a place of families, neighbours and relatives. Considering the low standing of the residents, it is clear that removing people from their neighbourhoods carries a risk of not only cutting them off from their livelihoods and support-networks, but also encouraging the economic deterioration of the whole Istanbul Historic Peninsula. Since the start of the speculative changes in the ownership pattern due to the renewal project, local residents, mainly wealthier property owners and tenants have left the neighbourhood, leaving the poorer behind. In particular, the absence of families has drastically changed the social environment. The suffering of such areas has been subject to numerous scholarly works highlighting the violation of property rights, the territorialisation of exploitation and the exclusion of local residents (see Sen et al., 2012; Dincer, 2011; Lovering and Turkmen, 2011). These unfortunate implications are visible within the claims of Suleymaniye residents: "it was once a great place to live. We had neighbours that we had known for 20 years. There was trust. Now, everyone I knew has gone, we lost contact. It is sad to see our neighbourhood in ruins", "Our neighbourhood was beautiful. Everyone knew each other. They abandoned us" (interview, march 2015).

While the number of local residents are decreasing, Suleymaniye continues to accumulate new urbanites, this time mainly Syrian families and Syrian bachelors who have joined the fight for survival and existence in the big city. Thus, urban poverty is continuously being reproduced in Suleymaniye. The abandoned buildings of Suleymaniye have become prominent shelters for Syrian refugees. Between 2011 to 2014, an estimated 1,350,000 Syrians fled to Turkey (Kirisci, 2014); and the number of so-called 'urban refugees' of Istanbul is thought to exceed 300,000 (Mazlum-Der, 2013). The conditions for those in the camps managed by the Disaster and Emergency Management Presidency (AFAD) are stated to be good, but the rest are facing great challenges. After

the demolition and abandonment of its buildings, Suleymaniye looks little different from the Syrian war-zone, and the struggle of survival for its new residents is still continuing, this time together with the undesired Istanbullites. Suleymaniye now looks like Damascus and is, in effect, Little Syria. There are large numbers of mostly women and children begging on the streets and many of these are living under very poor housing conditions or are finding shelter in abandoned properties or in the ruins by dividing the rooms with curtains and covering the windows with plastic. The increasing demand for rental property has resulted in increased rents, especially in the neighbourhoods that have high Syrian demand. In some cases, three or four Syrian families have to share the same building or room. Bachelor dwellings have continued to be the prominent visible signs of decay, although their user profiles are changing. There is no access to sanitation or water; the Municipality has already cut the public service to enforce Suleymaniye residents out of their neighbourhood in the name of renewal. As declared in the interviews published in Evrensel (2014) among others, they are afraid of living in abandoned or ruined buildings, but they cannot afford anything else as current rent values are equivalent to approximately €190-220. Another tyranny is the sadness brought about by living in Istanbul: "Everything was better in Syria. Everything was cheaper. If they gave us a house, we wouldn't need to live in these ruins." As stated by Oncu (2007: 235): "So for the majority of the city's ten million residents, nearly half of whom are recent arrivals, the glorification of Istanbul's ancient history, along with its aesthetic preservation and display in segregated tourist spaces has become the new exclusionary rhetoric of the moment".

THE SETTING OF HOSPITALITY IN THE TEMPORARY CITY ... THE SO-CALLED TEMPORARY CITIZENS OF THE TEMPORARY CITY

The use of power in the spaces of neoliberal Istanbul has different facets including the segmentation of the city into isolated clusters of construction through real-estate projects, rising archistars as the new symbols of prestige, and the production of the infrastructure to facilitate the flow of capital and desired persons. All of these have resulted in the clearance of so-called devalued spaces for capital valuation, in the rising of socio-spatial segregation and the formation of 'powerless' lower- and middle-income groups through forced evictions and state-led gentrification (Gunay, 2015b). The genuine character of Istanbul, together with its heritage is becoming lost in the struggle to reclaim power in the urban space. At the same time, the citizens of the city have been encapsulated within a choice of being either 'hosts' or 'guests'; hence, they are increasingly in danger of becoming a 'spectacle' of temporality. State-led renewal leads to the separation of communities according to socio-economic class, ethnic background and cultural choice. They transform the historic city into opportunity spaces built on the ruins of collective memories and social capital, often excluding and evicting the low-income members of the local community. They also often result in the displacing and replacing of new forms of poverty (Bartu-Candan and Kulluoglu, 2008).

Then who are the owners of the city? The question becomes quite ironic when thinking of Istanbul as a city of mobility, migration and thus temporality. In a city of 14 million, approximately 80% of which were born outside Istanbul, together with more than 300,000 Syrian refugees, who are the hosts of the city and who are the guests? According to the Municipality Law (Law no. 5393, 03.07.2005), 'hemsehri' (follow-citizenship) is defined as follows: "Everyone is a fellow-citizen of the county in which they live. The fellow-citizens shall be entitled to participate in the decisions and services of the municipality, to acquire knowledge about municipal activities and to benefit from the aid of the municipal administration. It is a basic principle to extend aid without hurting human feelings. The municipality shall perform any necessary activities to improve the social and cultural relations between fellow-citizens and to preserve cultural values." (Article 13). This is the 'law of hospitality' in Istanbul - with reference to Derrida (Dufourmantelle and Derrida, 2000). However, it is impossible to say that the 'law' has a basis in reality. Istanbul has two faces of 'temporaries' regarding the lack of rights; one is official, the other is unofficial. Syrian refugees are the officially defined temporaries (with reference to 'temporary protection status' enacted through 2014 Regulation) (see Kirisci, 2014). The residents of the city, though, are the ultimate unofficial temporaries.

According to Bartu (2000), what is being done in Istanbul shows how history, the past and its excavation is being used as symbolic capital in today's political fight. Through the ongoing destruction and reconstruction process in the everyday politics of the present, the 'conquest' of Istanbul fragments the urban space as well as its communities through its use of identities: pro-ottomans vs. republicans, insiders vs. outsiders, hosts vs. guests, owners vs. invaders. The state, as the 'temporary host' of the country as well as the city, holds the locality hostage while ignoring the heavy psychological and social

costs of enforced displacements and destruction. Conquest then becomes a cruel function of hosting through "hegemonic power relationships" (Turkun, 2011), and locking the Syrian guests in container cities is no different from evicting the undesired residents of Suleymaniye to the 'edge' cities. Because as Derrida (2000) states, although hospitality works with the marking of limits, powers, rights and duties in offering unconditional welcome to the new arrival, it is also an ethical problem concerning one's dwelling place, one's identity, one's space, and one's limits (p.77 and p.149).

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Four decades of vertical living: an analysis of the architectural development of the vertical social housing projects by the National Housing Authority in Bangkok Metropolitan Region between 1973 and 2013

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In Thailand, where fast-paced and often unplanned urbanization began as an aftermath of the Second World War, the challenges to provide housing to the rapidly growing number of urban inhabitants in Bangkok—the capital and sole primate city—became critical starting in the 1950s. The city struggled and failed to cope with the dramatic population rise, particularly in the lower-middle-income urban areas where the pace of urbanization appears to be the fastest. After a series of smaller measures had been implemented with limited success, the National Housing Authority (NHA) was established in 1973 to directly administer residential development within the kingdom. Since its inception, NHA began experimenting with vertical housing projects in order to provide affordable housing for Bangkok's low-income residents who were often marginalized by the commercial housing market.

Using a collection of vertical housing projects built by NHA in Bangkok Metropolitan Region (BMR) as case studies, this paper provides a survey of architectural developments of NHA's high-rise social housing. The primary emphasis will be on the changes in the approach to the construction and architectural innovations, illustrating through spatial and architectural analyses how quality housing and urban outcomes can be achieved within constrained social housing scenarios.

1. INTRODUCTION

1.1 History of social housing development in Thailand, from 1940 to 1972

The history of social housing development in Thailand can be traced back to 1940. Faced with a housing shortage for the low-income households in Bangkok as an aftermath of World War II, the Royal Thai Government established the Housing Bureau.[1] Through the Bureau, the government launched a nationwide initiative in support of housing improvement. In order to further promote comprehensive housing development, the government founded three additional public agencies: the Department of Public Welfare in1950, the Government Housing Bank in 1953, and the Bangkok Slum Improvement Office in 1960. Part of the first of the five-year National Economic and Social Development Plan inaugurated in 1961, the three agencies aimed to resolve a residential shortage which had been increasing every year. As a result, nearly 1,400 dwellings were constructed under the Housing Bureau's auspices by the mid-1950s, most of them in Bangkok.[2]

Even though these government agencies achieved some early successes, they were not sufficiently well equipped to cope with a problem as deeply-rooted and complex as housing the underprivileged urban dwellers. Eventually, it became clear to the government that none of these public agencies was able to fulfill Thailand's urgent housing needs.

1.2 The National Housing Authority (NHA)

Until 1973, the aforementioned three government agencies were responsible for housing in Thailand. The period prior to 1973 can be defined by a "laissez-faire" attitude towards social housing development. In the 1960s, the rapid urbanization of Bangkok resulted in a severe shortage of housing for the urban dwellers.[3] The responsible agencies' inefficient internal administrative organization prevented them from being able to satisfy the public demand thoroughly because each of these agencies belonged to different jurisdictions. As a result, housing problem for the low-income in Bangkok continued to deteriorate. This predicament eventually led to the merger in 1973 of three housing agencies and the development activities of the Government Housing Bank into the National Housing Authority of Thailand (NHA). NHA was closely modeled after the Housing and Development Board of Singapore, founded in 1960, which by the mid-1970s had provided suitable housing for about seventy percent of Singapore's population.[4] This represented an official commitment of the Royal Thai Government to a direct and active role in the provision of housing for its citizens through national planning under a single, national institution and marked a significant change regarding public housing policy in Thailand. The responsibilities of NHA were to build homes for people, to conduct urban community development, to clear slums and resettle the persons affected by the clearing operations, to provide dwellings and estates for rent, sale and hire-purchase and to manage them, and to subsidize tenants and buyers. NHA's responsibility was to provide low-cost housing for Bangkok's growing labor force.

1.3 Bangkok Metropolitan Region (BMR)

The geographical focus of this study is on the Bangkok Metropolitan Region (BMR), because it is by far the densest and due to the high cost of land, has had the largest number of high-rise social housing development in the nation. BMR consists of the Bangkok Metropolitan Area (BMA) and its five neighboring provinces: Pathum Thani, Nonthaburi, Nakhon Pathom, Samut Sakhon, and Samut Prakan. Bangkok has seen rapid urbanization since its population reached two million in the 1960s. Since the 1980s, greater Bangkok's built-up areas have spilled beyond Bangkok's borders to neighboring provinces, initially to the north and south. With the combined area of 7,762 square kilometers, the population of BMR was estimated at around seven million in 1980; around nine million in 1990, it was; around 10 million in 2000, and rose to a level of 14.5 million in 2010.[5]

Bangkok is a primate city. Around sixty percent of the Thailand's urban populace lives in Bangkok. It is the political, monetary and budgetary, social and instructive focal point of Thailand. Employment opportunities in industrial and service sectors attract labor to Bangkok from all over the country. Moreover, the standard of living in the capital is also significantly above the national average. According to the Thailand Development Research Institute (TDRI), the 2013 Gross Provincial Product (GPP) per capita was 12,766 dollars for BMR versus 6,293 dollars the nation's average.[6] Because of economic opportunities, some migrants come to work in Bangkok for only part of the year, and return to their villages when needed on the farm. Others come for a couple of years to earn sufficient money to make a larger investment back home. Many come to stay. Most families in Bangkok, whether they stay for short or long periods, face enormous problems finding affordable housing.[7]

2. RESEARCH AIMS AND METHODOLOGY

2.1 Research objectives

To Study the development model of social housing projects by NHA in BMR during the period of four decades, from 1973 to 2013.

To investigate and understand surrounding factors that have influenced the development of high-rise social housing projects by NHA in BMR during the period of four decades, from 1973 to 2013.

To analyze changes in construction approaches the development of high-rise social housing projects by NHA in BMR during the period of four decades, from 1973 to 2013.

To highlight key innovation and analyze design innovations utilized in the architecture of high-rise social housing projects by NHA in BMR during the period of four decades, from 1973 to 2013.

To construct a comprehensive conclusion, identify advantages and disadvantages, and finally make grounded recommendations to NHA regarding the design of high-rise social housing projects in order to benefit the future development.

2.2 Scope of study

This emphasis of the study is on changes in approaches to construction and design innovations of the high-rise social housing projects by NHA and as well as to gain greater comprehension of

environmental factors such as economy, technology, and changes in the society that have influenced the development of high-rise social housing by NHA.

2.3 Research hypothesis

Design innovations were products of negotiation between design intent and economic, social and technological factors.

Technological and environmental changes affected the approaches to architectural design and construction of NHA high-rise social housing development. C

3. CASE STUDY

3.1 Case study outline

This developmental research analyzes the evolution of various influencing factors as relating to physical and functional aspects from nine different developments built between 1973-2013 in Bangkok, Nonthaburi, and Samutsakhon. It is intended to understand the ideology of these high-rises, physical manifestation thereof as well as the changing function. Information from various sources such as NHA, field-collection, direct interviews of NHA personnel, publicity, and media indicate the evolving style and design methodology of these vertical housing by cross analyzing the relationship between the environment and the resulting changes. The aim is ultimately to understand the design approach and projected tendency of the development for these vertical housing by NHA.

3.2 Sites of analysis

This section provides the basic introduction of each site which was studied.

3.2.1 National Housing Authority Public Community at Huai Kwang

The National Housing Authority Public Community at Huai Kwang consists of thirty-eight residential buildings, was open in 1969 to house 3,360 low-income households. It is located on a 15.03 square-kilometer parcel in a high-density commercial and business core of Central Bangkok, National Housing Authority Public Community at Huai Kwang runs the length of many roads within the boundaries. Today, the complex is predominantly surrounded by row houses. Being centrally located yields several advantages such as access to infrastructure and different modes of mass transit.

3.2.2 National Housing Authority Public Community at Din Daeng

The National Housing Authority Public Community at Din Daeng, which consists of four eight-story residential towers containing 1,020 units and sixty five-story buildings housing 8,222 additional living units, was open in 1973. Located on an 8.4 square-kilometer parcel on Din Daeng Road in Din Daeng District in the heart of Bangkok where major mass transit lines converge (Paholyotin, Asoke-Din Daeng) with a direct route to Bangkok and Suvarnabhumi International Airports, the National Housing Authority Public Community at Din Daeng runs the length of many roads within the boundaries. Today, the project features commercial, service, and high-density residential programs.

Figure 1. The case studies for this research are located throughout the Bangkok Metropolitan Area (BMA). Source: Researcher (2015).

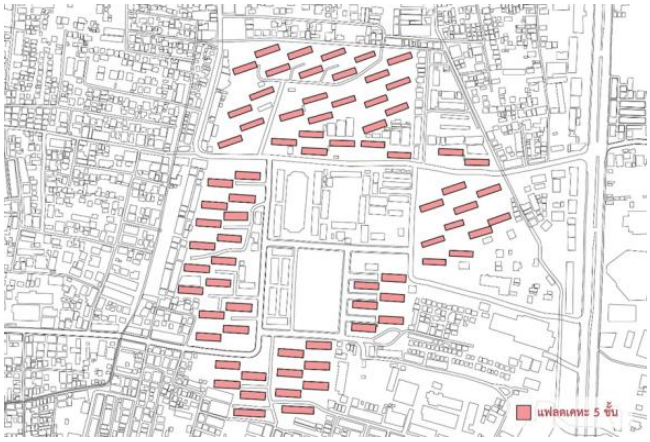

Figure 2. The National Housing Authority Public Community at Huai Kwang master plan illustrates the orientation of residential towers and open grounds for communal uses as well as its surrounding urban conditions and infrastructure. Source: Researcher (2015).

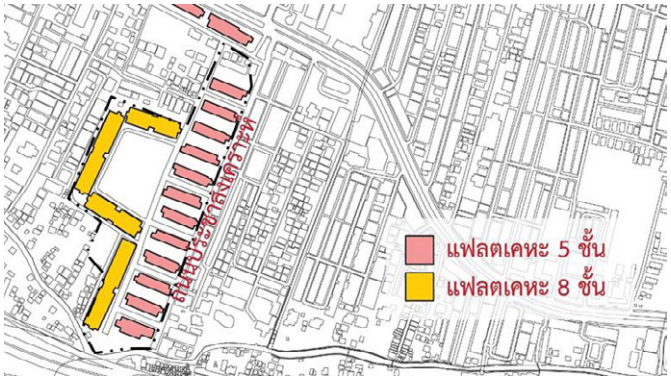

Figure 3. The National Housing Authority Public Community at Din Daeng master plan illustrates the orientation and location of the four eight-story and sixty five-story residential buildings, and open grounds for communal uses as well as its surrounding urban conditions and infrastructure. Source: Researcher (2015).

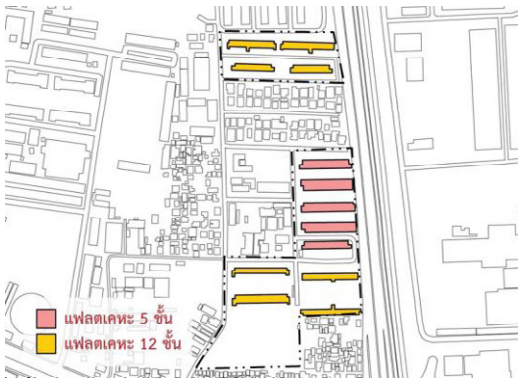

Figure 4. The National Housing Authority Public Community at Bon Kai master plan illustrates the orientation and location of the residential buildings, and open grounds for communal uses as well as its surrounding urban conditions and infrastructure. Source: Researcher (2015).

Figure 5. The National Housing Authority Public Community at Lak Si master plan illustrates the orientation and location of the residential buildings, and open grounds for communal uses as well as its surrounding urban conditions and infrastructure. Source: Researcher (2015).

Figure 6. The National Housing Authority Public Housing Samut Sakhon Phase II master plan illustrates the orientation and location of the residential buildings, and open grounds for communal uses as well as its surrounding urban conditions and infrastructure. Source: Researcher (2015).

3.2.3 National Housing Authority Public Community at Bon Kai

The National Housing Authority Public Community at Bon Kai, which contains six twelve-story residential buildings with 167 units and five eight-story buildings with 272 units, was open in 1976. Located on an 8.37 square-kilometer parcel in Lumpini, Patumwan District, National Housing Authority Public Community at Bon Kai is centrally located and enjoys the benefits from the convergence of several lines of mass transit. A diverse collection of programs is currently available on site, including: business center, commercial and service cores, health care facility, cultural, educational, and diplomatic uses.

3.2.4 National Housing Authority Public Community at Lak Si

The National Housing Authority Public Community at Lak Si, which consists of fourteen residential buildings with 2,418 units, was opened in 1988. Located on a 22.841 square-kilometer parcel in Northern Bangkok, which is a satellite residential community, the National Housing Authority Public Community at Lak Si is surrounded by a collection of medium-density houses, row houses, and condominiums. Although situated in a suburban area, the project is well-served by the mass transit systems linking the city center from Bang Sue and Lak Si as well as a network of roads and expressways.

Figure 7. The National Housing Authority Public Housing Baan Nonthaburi IV master plan illustrates the orientation and location of the residential buildings, and open grounds for communal uses as well as its surrounding urban conditions and infrastructure. Source: Researcher (2015).

Figure 8. The National Housing Authority Public Romklao III Phase III master plan illustrates the orientation and location of the residential buildings, and open grounds for communal uses as well as its surrounding urban conditions and infrastructure. Source: Researcher (2015).

3.2.5 National Housing Authority Public Housing Samut Sakhon Phase II

The National Housing Authority Public Housing Samut Sakhon was opened in 1993 and consists of seven residential buildings with 940 units. The project is located within Amphoe Muang, Samut Sakhon province, the area also runs the length of many roads. The parcel comprises 492.04 square kilometers and is generally surrounded by of single-family houses on the banks of Ta Chin River, a mere two kilometers from the coast. The topography is mostly flat and low-lying, and thus the main demographic is agricultural and fishing industries as the province is rich in marine cultures. Neighboring areas are of low-density typical of provincial, industrial areas with most occupants being temporary lodgers—mostly foreign expatriates. Therefore, the majority of surrounding plots of lands are residential in order to accommodate the rapidly-growing demand of housing for foreign workers and commercial enterprises that meet a modern-living standard.

3.2.6 National Housing Authority Public Housing Baan Nonthaburi IV

The National Housing Authority Public Housing Baan Nonthaburi IV which consists of nine residential buildings with 540 units was opened in 1996. Located on a 77.018 square-kilometer parcel near the Pak Kret five-way intersection in Amphoe Muang Nonthaburi, Baan Nonthaburi IV is surrounded by low-density residential neighborhoods, a governmental center, schools, and markets. It also benefits from an abundance of means of transportation, namely buses and communal vans to Bangkok that stop in front of the development.

3.2.7 National Housing Authority Public Romklao III Phase III

The National Housing Authority Public Romklao III Phase III, which consists of thirty-six residential building with 2,160 units, was opened in 1999. The project is located on a 123.86 square-kilometer parcel in Klong Song Ton Nune, Lad Krabang District. It runs the length of many roads, at the east end of Bangkok and is surrounded by predominantly industrial buildings. The area is low-density, and has vertical multi-unit residential (rarely any single-family residences) and has convenient stores, restaurants, parks. However, its rural location necessitates the use of automobiles or one of the abundant bus lines as transportation for those who work in the city center.

4. ANALYSIS

In each project, an NHA architect was responsible for creating homes for more than ten thousand households. In envisioning such large-scale projects for a wide range of clients, there were three major factors that influence the design of the architecture: politics; economy of design which comprised three sub-factors: location, and construction and building technology; and finally, design and aesthetics.

4.1 Politics

First, politics was the most important factor that dictates the architectural design and style of the social housing buildings. Since the mid-twentieth century, there were several surrounding factors such as a sharp rise in urban population, a growing economy, and changing social and political frameworks that had an impact on the formulation and implementation of the government's social

Figure 9. Completed in 1969, National Housing Authority Public Community at Huai Kwang which was the first project under the auspice of NHA represents a design and aesthetic style that was approved by a series of committees. Source: Researcher (2015).

Figure 10. The National Housing Authority Public Romklao III Phase III, which was completed in 1999, thirty years after Huai Kwang, demonstrates an even starker and minimalist away approach to architecture by NHA. Source: Researcher (2015).

housing development. First, Thailand underwent drastic demographic expansion following the Second World War as a result of the strategic promotion of high-fertility and population transfers.

In 1975, the population growth rate reached a level of 3.3 percent per annum. Between 1947 and 1971, Bangkok's population rose more than 300 percent, from 781,660 to 3,075,300. Thailand's economy also expanded rapidly in the 1960s partially thanks to increased demand for goods and services by the American troops stationed in Southeast Asia during the Vietnam War.[8] However, the world oil crisis of 1973 brought the country's economy to near stagnation thereafter. On the macroeconomic level, economic instability provided Thai decision-makers an excuse to consider social housing development as items of welfare, rather than as a necessary infrastructural investment. On the microeconomic level, even though Thailand's GDP had been rising constantly, eighty percent of the population had incomes of 300 dollars or less per month in 1978.[9]

Low income levels made it nearly impossible for urban dwellers to afford proper housing without government assistance. Finally, Thai social and political frameworks have also played an important role in the nation's development of social housing. Thailand's social values and political culture have been very centralized, with the capital being the sole epicenter. The national government, by initiating all policies and by extending substantial financial subsidies to municipal governments, assumed control over social housing development plans and nationwide. Despite the central government's desire to provide decent, affordable, and accessible housing for low-income urban dwellers, the difficult housing development in Thailand has been compounded by inflexible centralized bureaucracy, most urban households' low income levels and the rapid population increase, in spite of the overall growth in the national economy.

Usually, the design process underwent many levels of examination by various committees before passes a bill by the cabinet. Naturally, the design was subject to much scrutiny and constant revisions to comply with budget restrictions and changes in political climates. A project could take years to be realized even if contained little or no out of the ordinary details beyond which had been previously approved in precedent projects.

4.2 Location

The project location determined the land price and consequently the building's height. The location of the building also regulated the mathematics of the architectural design. NHA's social housing projects all started very mathematically with the calculation of Floor Area Ratio (FAR) and Open Space Ratio (OSR) of the entire project. Then, the architects sought to optimize the number of units per building. That number was derived by dividing the net area by 28, which was the minimum size in square meters of a living unit. The size of a living unit was also related to the height of the building; the taller the building, the smaller the unit. Due to the fact that utilities were calculated based on unit area, the size of a living unit in recent projects has dwindled in order to make it affordable to the masses.

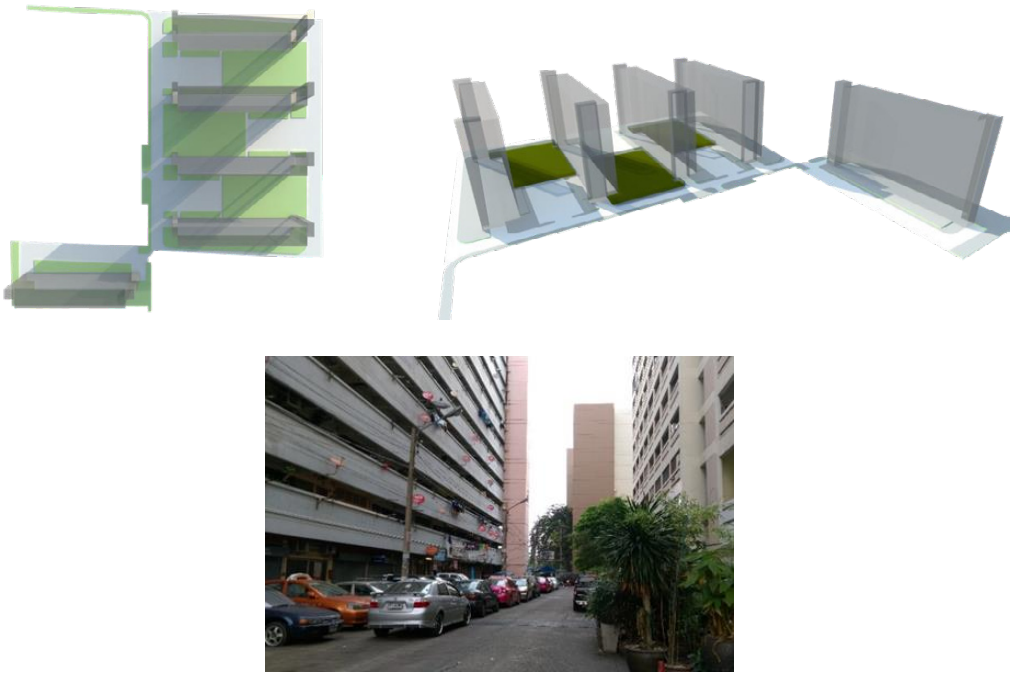

Figure 11: A site plan, an aerial perspective diagram, and a photo of the Bon Kai project suggest it was conceived to be a series of tall residential slab in order to increase density and satisfy the high price of lan in the commercial heart of the city. Source: Researcher (2015).

4.3 Design and aesthetics

On an urban scale, NHA social housing projects sought to demonstrate their concerns for community in the planning of the site and the design of the space. Programmatically, NHA held a rather holistic design approach in comparison to its private counterparts. In addition to creating livable housing units, it strove to provide other components and other amenities including a community center, a cooperative, a nursery, and an occupational training center. These programs functioned as fillers in the site plans as they are usually planned to occupy the open spaces between residential slabs. These smaller one-or-two-story buildings enjoyed the benefits of being surrounded by a landscape and located at a strategic location which was intended to help bring people together.

There were two different treatments of ground level. First, in the urban area where land price was high, the ground level of each building had no residential units. Instead, it was allocated to limited bicycle and motorcycle parking as well as social functions a lobby and living and reading room. Second, in the suburban projects where land price was lower, the ground floor contained both a small lobby and residential units. Bicycle and motorcycle parking was located outside the building and car parking occupied the open space between two adjacent buildings and sometimes also road surface due to the increased number of vehicles needed to commute into the city.

The building's floor plan has been altered in order to increase cost efficiency. The double-loaded corridor which was a prevalent system used in almost all of the recent developments have replaced the single-loaded corridor preferred the earlier housing projects due to the high cost of construction and less cost-efficiency. However, the new system had its shortcomings. Although it was more practical, the double-loaded corridor could cause hygienic problems due to lack of direct exposure to sunlight and limited ventilation. The dark corridors with a series of front doors facing into one another were also considered less pleasant than the low eaves covering the hallway where social interactions occurred in the single-loaded corridor model. Furthermore, residents' lifestyles contributed to the morphological transformation of social housing projects. In the five-story buildings of earlier eras, the inhabitants complained about the difficulty of climbing five flights of stairs because an elevator was not required by law in buildings of that height. Consequently, sales of the fifth-floor unit plummeted. Thus, in the new generation of NHA social housing, there were only four floors to better suit the needs of the market.

4.4 Construction/building technology

In an attempt to reduce the construction cost and time, NHA adopted prefabrication as an alternative to the traditional reinforced concrete construction. Building envelope panels and living units were precast in the factory and then transported on flatbed trucks to be assembled on site. Additionally, new computer programs such as Google SketchUP, Autodesk Revit, and Ecotect helped improve the master plan design and increase the building's energy efficiency. The computer programs have

Figure 12. There are two different treatments of ground level. In some projects, it is allocated to limited bicycle and motorcycle parking as well as social functions a lobby and living and reading room while it contains both a small lobby and residential units in others. Source: Researcher (2015).

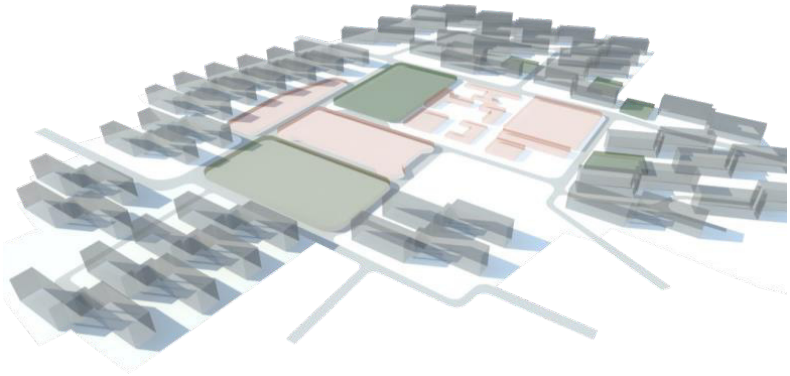

Figure 14. Since the beginning at Huai Kwang in 1969, NHA architects have used their knowledge of sun and wind patterns in order to orient the buildings optimally to avoid unnecessary heat gain from sun exposure. Source: Researcher (2015).

gained a greater role in the design phase of the housing projects. NHA architects have employed them to simulate the Sun and wind patterns in order to orient the buildings optimally to avoid unnecessary heat gain from sun exposure. This also affected the external appearance of the building because it allowed the building to be more open and acquire fewer exterior louvers or brise-soleil which are very costly.

Some of the technological advancements happened in-house through years of experience and experimentation, while other skills and techniques have been acquired through international cooperation. NHA has collected much experience and important information on social housing design and operation from their recurrent field trips to observe the housing systems in countries both on the Asian and Australian continents. There were so consistent collaborative long-term research, short-term workshops, mini-projects with Japan via Japan International Cooperation Agency (JICA) and its Korean equivalents on construction technology and development of architectural elements. However, the results of international collaborations have met some real-world application challenges. Although the laboratory research has yielded some interesting and potentially groundbreaking materials and construction techniques in reducing the construction costs and increasing energy-efficiency of the buildings, geographical and climatic differences proved obstructive to incorporating these discoveries into the actual construction process.

5. CONCLUSION

These case studies of vertical housing projects built by NHA in the Bangkok Metropolitan Region (BMR) provide a survey of architectural developments in NHA's high-rise social housing, emphasizing the changes in the approach to construction and architectural innovations and illustrating through spatial and architectural analyses how quality housing and urban outcomes can be achieved within constrained social housing scenarios. The design innovations were often simple and minimal yet well executed strategies, focusing on the efficiency of internal apartment/unit planning, arrangement of tenancy mix/social diversity, interfaces of private dwellings with common areas and public spaces, parking arrangements, design of common areas, and addressing privacy and noise through landscaping and careful planning.

NHA architects played a critical role in the ongoing evolution of social housing, particularly in developing creative and non-standard solutions to planning and design, in delivering innovative design outcomes. Factors leading to innovation included constant negotiation between design intent and social, economic, and political influences, alongside the adoption of new sustainable technology, and project alignment with existing urban renewal strategy.

In the future, NHA has already announced plans to renovate the existing projects, demolish and then rebuild outdated structures, and finally develop new projects in accordance with the development plan of the Royal Thai Government with a focus

on Transit Oriented Development (TOD) along the newly constructed metro lines in BMR to reduce dependency on personal transportation. Regarding the design, NHA architects are working on sublimating more architectural elements that relate to the context of each project in an effort to create a distinct identity, which, in turn, can create a sense of place and belonging among the habitants, and thus to reinforce a stronger sense of community. Flexibility rather than specialization, openness rather than segregation from the surrounding community, and Industrialization rather than handicraft are becoming three important pillars in future developments. However, the great imminent challenge facing NHA in the coming years is that many existing structures are outdated and some are becoming unfit for living. This is becoming an urgent concern regarding design, engineering, economic, and socio-political solutions to renovate obsolete structures and manage the relocation of low-income family currently living in those vertical housing.

ENDNOTES

1 (Chiu, December 1983)
2 Ibid.
3 (Sheng, March 2002)
4 Ibid.
5 Ibid.
6 (Sheng, 1992)
7 Ibid.
8 (Chiu, December 1983)
9 Ibid.

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Urban design factors associated with perceived assessment in the walking activities of elder groups: case study of central Shanghai, China

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Walking is one of the most environmental-friendly and healthy means of transportation. With the influence of motorisation, the walkability of urban areas has been declining in recent years. China has the largest elder population in the world. Issues on making neighbourhoods walkable for them have drawn wider attention in the process of aging. Considering the physical and mental characteristics of the elderly, walking activities are sensitively influenced by environmental perception e.g. the quality of the walking environment. However, little emphasis has been placed on the relationship between the factors of the physical environment and the perceptive assessment for walking among the elderly. The aim of this research is to find out the key environmental factors, which facilitates walking among old people.

Based on 21 neighbourhoods' cases in central Shanghai, the method of questionnaire-surveying (n=1365) was employed to get the elderly's assessment on the walking environment. The measures of the physical environment including aspects of the urban fabric, land use, interface form and walking facilities were collected by site observations and GIS databases. Correlation and multinomial logistic regression analyses were implemented to find out the key variables, which are associated with the assessment. It was found that environmental factors such as the width of sidewalks, the density of commercials, population density and the presence of transparent boundaries all have influences on the seniors´ satisfaction of their environment. While these and the scale of the neighbourhoods, and the presence of education facilities are related to the necessary evaluation of the elderly's walking activities, in addition, socio-demographic attributes like age, gender and income also have an effect on the perception of their walking environment.

In conclusion, the assessment showed that the elderly's perception of the environment and their willingness toward walking activities are associated with urban design factors, especially from the urban fabric and land use aspects. Identifying these factors can call for intervention strategies from policy makers and designers to make neighbourhoods walkable for senior citizens.

1 INTRODUCTION

Issues on aging society have drawn wider attention than ever before in the world. China has been an aging society and it is predicted that the population of those older than 60 years old will reach to 430~450 million by the year of 2050, accounting for one third of the whole population (NBOS, 2010). Walking is one of the most important physical activities among the elderly. The environment for the elderly's daily walking activity has been affected by the increasing number of vehicles and other factors. This leads to a drastic squeeze in walking space. It is a vital agenda to build up an inclusive society when taking the elderly's walking environment into account.

Shanghai has the highest level of aging in China. Older adults (older than 60 years old) have taken up to 15.26% of the whole population by 2010(NBOS, 2010). Considering the physical and mental condition of the elderly, their activities are mostly taken place in the site-level and neighborhood level (Wang and Lee, 2010). The attitude toward walking and the satisfaction of neighborhood surroundings play significant roles in the elderly's walking behaviors, while urban design factors contribute a lot when the

older people make these perceived assessments of environment. Therefore, to make a more walkable neighborhood for the elderly, it is meaningful to find out the urban environment factors which are related to satisfaction assessment and walking attitude among the elderly

2 LITERATURE REVIEW

2.1 Physical activity and health among the elderly

Walking is one of the most popular physical activities. The relationship between physical activity and public health was widely concerned by researchers from public health and preventive medicine fields (Pate et al., 1995, Haskell et al., 2007). Previous studies pointed out that a moderate dose of exercises has great benefits on individual's mental health (Barton and Pretty, 2010). Environment induces the physical activity and a higher level of self-reported health status was found from those who lived in a more qualified community (Sugiyama and Ward Thompson, 2007). With the rapid development of economy in China, an increasing number of older adults have paid attention to health issues as well as physical activities. A research on older adults' activity in several communities in Shanghai showed that the proportion of those who participated in physical activity has reached to 49.4%, much higher than the average rate in whole nation, 28.2% indeed (Tang et al., 2009). Walking has taken up to 51.6% of all the means of trips among the elderly, based on a recent study on four communities in Shanghai (Huang and Wu, 2015).

2.2 Environmental perception and attitude toward walking

Perception may have potential effect on individual's behavior, especially among the elderly. The Theory of Planned Behavior (Ajzen, 1985) pointed out that the appearance of behavior was indirectly affected by behavioral intention, which was associated with three factors, namely attitude, subjective norm and perceived behavioral control (PBC). The attitude and the PBC in elderly's walking activity mainly indicate what kind of attitude they hold toward walking, and what kind of assessment do they evaluate when they are in certain circumstances. Social cognition and perceived environment, as well as other factors like self-efficacy, social support, facility access and neighborhood safety, affected the older adults' walking activity (Booth et al., 2000). Perceived environment attributes, like residential density, land-use mix and street connectivity, were positively associated with a high-walkable neighborhood (Leslie et al., 2005). Recent research found that the perceived access to shops, crowdedness, presence of seats and easy access of residential entrance were positively related to the elderly's walking activities (Cerin et al., 2014)

2.3 Objective-measured characteristic of neighborhood

An increasing number of researches turned to pay attention on the characteristics of walkable neighborhood from the perspective of built environment. Emphasis was placed on the objective-measured urban form elements of neighborhood and they intended to find out the key elements which were associated with the elderly's walking activities, at a more micro-level. Li's research indicated a positive relation between built environment factors (density of places of employment, household density, green and open spaces for recreation, number of street intersections) and the elderly's walking activity at the neighborhood level (Li, 2005). Besides, smaller street-blocks around home, and shorter distances to food and daily retail facilities from home, are the key indicators of walkable neighborhoods (Moudon et al., 2006). Other studies found that the amount of commercials and traffic volume (Nagel et al., 2008) and the layouts of public transportation facilities (Huang and Wu, 2015) also influenced on the older citizens' walking activities.

Previous studies paid much attention on public health, perceived walking environment and few objective-measured urban design factors, few emphasis were placed on which kind of urban design elements were associated with the perceived assessment of walking environment. Besides, quantitative analysis is also deficient to find out on what degree the urban design factors have influenced the elderly's perception. The aim of this research is to identify the urban design elements which contribute to a higher level of environmental assessments and a more positive attitude toward walking among the elderly.

3 RESEARCH METHOD

3.1 Selected cases

This study selected 21 neighborhoods in central area in Shanghai as cases. These neighborhoods were catalogued into 5 groups based on their times of construction and their spatial morphology. Five categories consist of 1) Historical neighborhood, 2) Workers' village, 3) Old neighborhood, 4) New neighborhood, and 5) International neighborhood. (see Figure 1) All these selected neighborhoods were equipped with explicit boundaries like main roads or rivers, so residents could inhabit and take

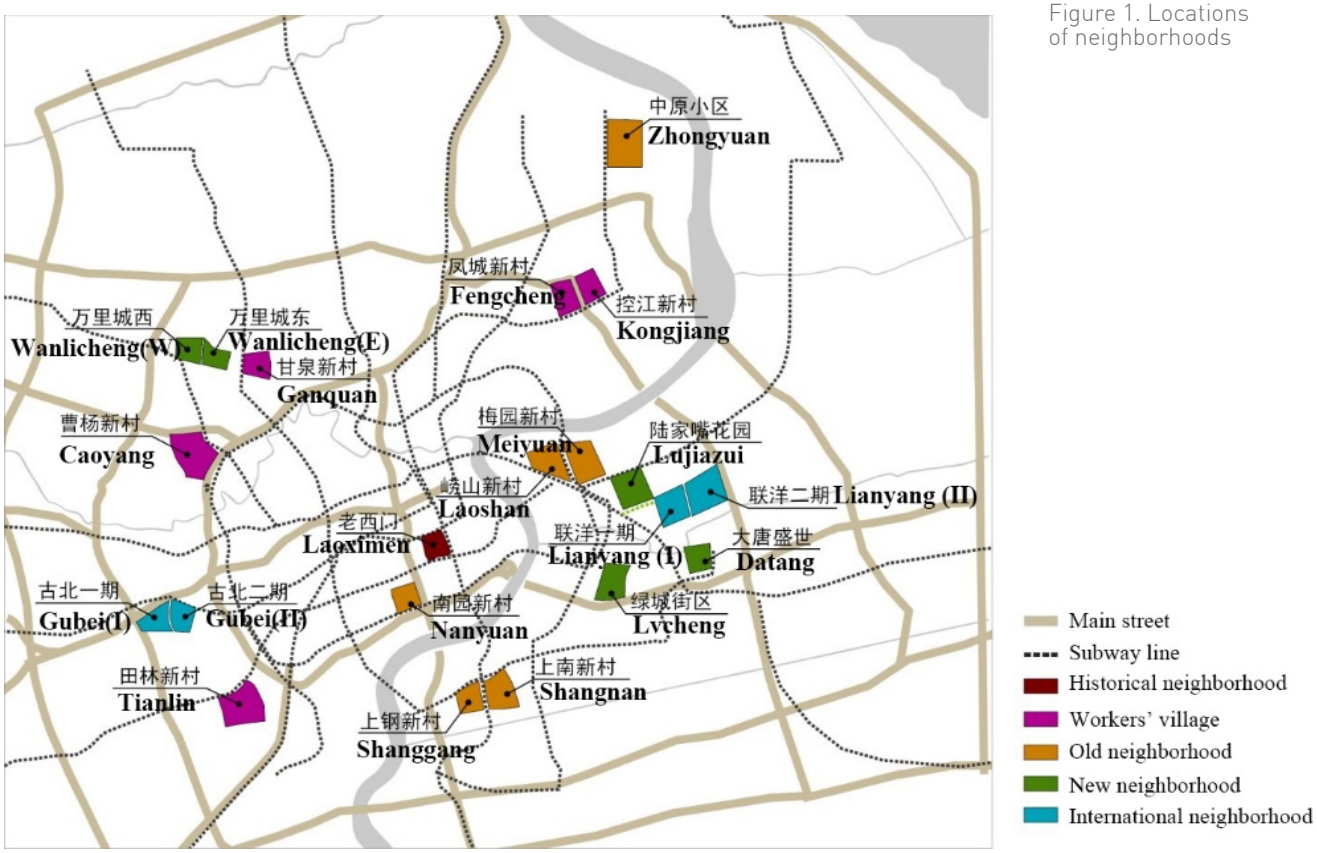

Figure 1. Locations of neighborhoods

walking activities in a certain area. What is more, dwelling function in these neighborhoods must be prior. And the neighborhood was all equipped with well functionally infrastructures like accessible public transits, convenient commercial facilities along the road instead of commercial complexes and landmarks of the city.

3.2 Data and measurement

During December 2011 to June 2012, questionnaires were distributed to the dwellers from all age groups by the neighborhood committee members of these 21 neighborhoods, and sent back within 2 weeks for each neighborhood. The amount of questionnaires for each neighborhood was guaranteed about 200 and the total amount was 3820. At last 2863 questionnaires were selected as valid from 2940 sent-back questionnaires. In this research, questionnaires from 1365 respondents older than 50 years old were filtered.

The questionnaire mainly includes three parts: 1) Social-demographic attributes, like age, gender, monthly income, etc. 2) Attitude toward walking activity, responses were made on a five-point Likert scale ranged from "extremely unnecessary" to "extremely necessary". To get this assessment, interviewees were asked "What is the degree of necessity of walking in your daily life?" 3) Satisfaction assessment on walking environment, which included an overall evaluation of the walking environment measured by a five-point Likert scale which was ranged from "extremely dissatisfied" to "extremely satisfied" and four sub-factor assessments on the walking environment by a three-point Likert scale including "dissatisfied", "so-so" and "satisfied". The sub-factor assessments contained the evaluation of a) the convenience of access to the public transit, b) the accessibility level of commercial, c) satisfaction level of security, and d) comfort assessment of walking.

The objective-measured urban design variables, from four aspects like spatial texture, land use, morphological interface and walking facility, were gained from the Geographic Information System Database provided by Shanghai Urban Planning and Design Research Institute. All variables are listed in Table 1.

4 ANALYSIS

4.1 Descriptive Analysis

Statistics show that a total proportion of 61.86% in all senior respondents reported a positive evaluation on the walking environment, including 13.81% of the respondents reported "extremely satisfied" and 48.05% reported "satisfied". This means that the walking environment in these 21 neighborhoods were in relatively good conditions. However, nearly two fifth of the interviewees made a negative

Social-demographic Attributes	Perception of Walking Environment and Attitude	
Age Gender Monthly Income	Attitude toward Walking	Overall Satisfaction of Walking Environment · Convenience of Public Trans · Accessibility of Commercial · Satisfaction of Security · Comfort of Walking

Objective Measured Urban design Variables			
Spatial Texture	**Land Utilization**	**Morphological Interface**	**Walking Facility**
Population Density(**ST1**) Average Block Length(**ST2**) Section-Node Ratio(**ST3**)	Density of Centralized-Commercial (**LU1**) Density of Commercial Interface(**LU2**) Density of School(**LU3**) Density of Office Building(**LU4**) Density of Green Space(**LU5**) Density of Public Trans Station(**LU6**) Density of Public Trans Route(**LU7**) Density of Subway(**LU8**) Proportion of Commercial Interfaces ≥15 Stores (Per 100m) (**LU9**)	Density of Entrance to Residential(**MI1**) Density of Entrance to Parks(**MI2**) Proportion of Commercial Interface(**MI3**) Proportion of Penetrable Interface(**MI4**) Proportion of Closed Interface(**MI5**)	Density of Walkable Area(**WF1**) Average Width of Sidewalks(**WF2**) Proportion of Sidewalks<3m width(**WF3**) Proportion of Sidewalks≥10m width(**WF4**)

Table 1: Perceived environment and urban design variables

assessment on the environment, demonstrating that it is necessary to optimize the built environment for providing a better circumstance for the elderly's walking activity. As to walking attitude, a total proportion of 85.56% interviewees responded "extremely necessary" or "necessary". The result posed a reality that walking activities had been accepted by most of the senior adults.

As for the other four sub-factors matters, the assessment on convenience of access to the public transit declined with the growing age of the respondents. The proportion of "dissatisfied" in the oldest age group (>80 years old) was much higher than those of other age groups. It can be illustrated that the barrier-free facilities and the service radius of public transit facilities could not meet the elderly's need. The surveys on satisfaction level of security and comfort level of walking revealed that these two sub-factor assessments were associated with the interviewee's economic status. On the whole, the higher monthly income an individual had, the higher evaluation he/she made. This result could be illustrated that old people occupying a higher salary usually lived in a superior community where the security was guaranteed and surroundings were well managed. The descriptive analysis above revealed a fundamental status-quo of the perception of the walking environment and the attitude toward walking among older adults. However, the key environment variables affecting the causality are still left to be found and a series of correlation test

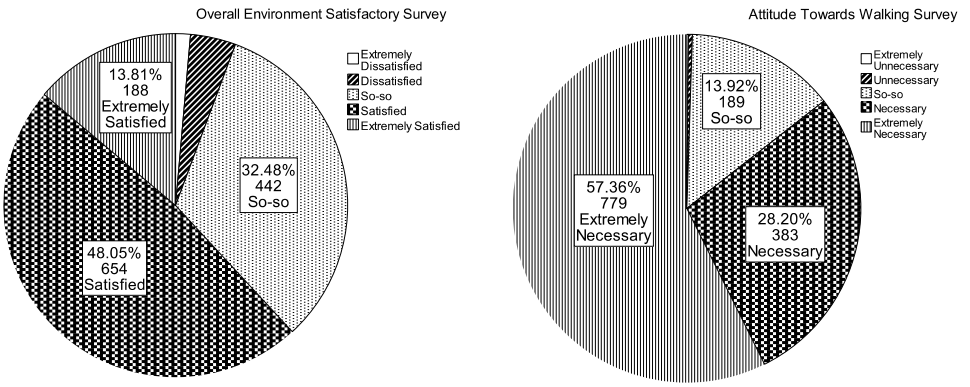

Figure 2: Surveys on overall environment assessment and attitude toward walking

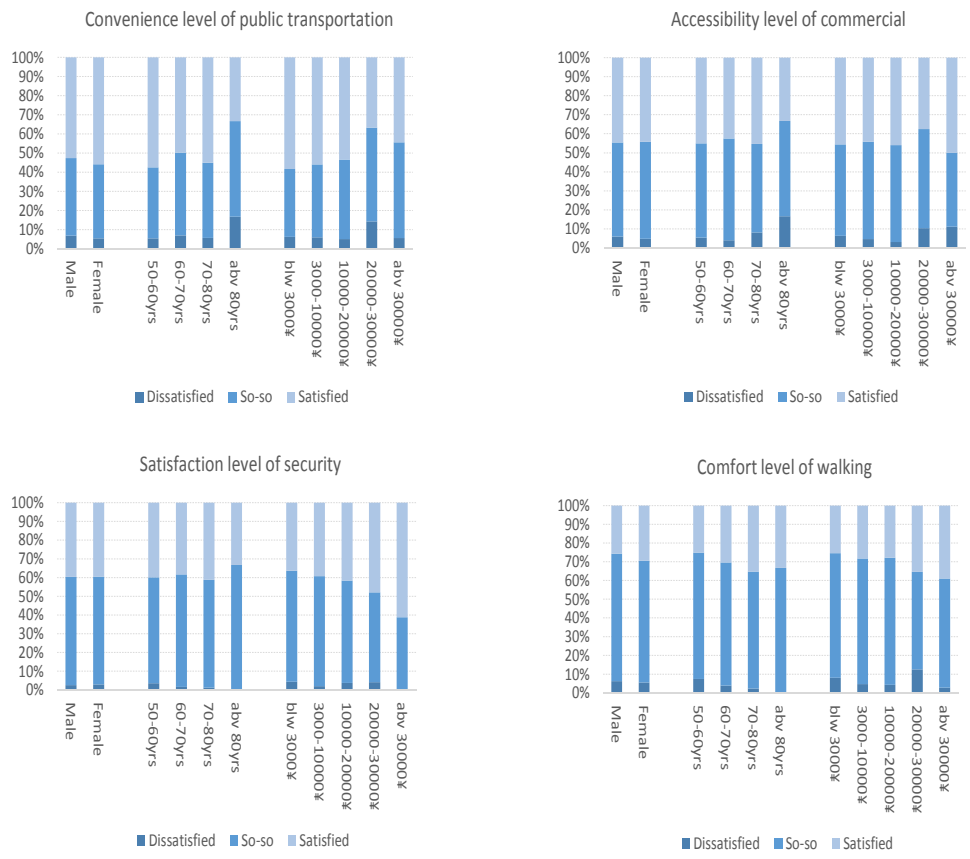

Figure 3: Surveys on the assessments four sub-factors of walking environment

in the next are worthy to be done.

4.2 Correlation Analysis

Correlation test was employed to find out the association between and the elderly's environment perception and urban design variables, which were obtained from GIS Database. All collected data were calculated in Statistical Product and Service Solutions (SPSS, Version 19, IBM Inc. 2010) and all significant results of Pearson correlation test(p Value<0.01)are listed in Table 2.

The result showed that elements from spatial texture aspect had few significant relations with the elderly's walking attitude, while some of those from land use aspect, like the density of education facilities (0.173), proportion of commercial interfaces ≥15 stores per 100m (0.106), density of commercial interface (0.074) and density of office building (0.079), were associated with the attitude toward walking among the older adults. Variables from morphological interface, like the proportion of commercial interface (0.104), was positively correlated to walking attitude, while the proportion of penetrable interface (-0.093) showed negative. What is more, the proportion of sidewalks≥10m width (-0.216) was negatively correlated to walking attitude.

As for the perceived assessment of the walking environment, the density of population (-0.084) and section-node ratio (-0.084) showed negative correlation with the overall perception. A pair of variables from land use aspect showed an inverse correlation with overall perception of walking environment, they were density of centralized-commercial (0.100) and the density of commercial interface (-0.078). Besides, the proportion of commercial interface (-0.116) showed negative while the proportion of penetrable interface (0.131) positive. The proportion of sidewalks<3m width (0.111) contributed to a positive evaluation of the overall walking environment. A number of urban design variables were found correlated with the sub-factor assessments. Those variables influencing the evaluation on convenience to the public transit were the proportion of commercial interface (0.235), the density of public trans route(0.234), education facilities (0.220), subways (0.210)and the proportion of penetrable interface (-0.189). On evaluating the accessibility level of commercials, the density of office buildings (0.164), education facilities (0.134), public trans routes(0.129), and entrance to parks(0.118) showed positive correlation with the assessment while the proportion of penetrable interface(-0.077) showed negative. The density of population (-0.146) and the proportion of commercial interfaces≥15 stores per 100m(-0.129) showed

Table 2: Pearson correlation test between environment perception and urban design variables

Urban design Variables		Walking Attitude	Overall Stsf.	Public Trans Stsf.	Commercial Facility Stsf.	Security Stsf.	Comfort Stsf.
Spatial Texture	ST1		-.150**	.112**		-.146**	-.144**
	ST2				.073**		
	ST3		-.084**				-.084**
Land Use	LU1		.100**	.108**	.077**	.076**	.078**
	LU2	.074**	-.078**	.155**			
	LU3	.173**		.220**	.134**		
	LU4	.079**		.149**	.164**	.095**	
	LU5						.074**
	LU6				.088**		
	LU7			.234**	.129**		
	LU8		.075**	.210**	.089**	.097**	
	LU9	.106**	-.130**	.093**		-.129**	-.135**
Morphological Interface	MI1			.095**			
	MI2			.152**	.118**		
	MI3	.104**	-.116**	.235**	.088**		-.131**
	MI4	-.093**	.131**	-.189**	-.077**	.079**	.126**
	MI5						
Walking Facility	WF1			.136**			
	WF2			.157**	.102**		
	WF3		.111**			.093**	.100**
	WF4	-.216**					

*Notes: Stsf. means satisfaction. **. p Value＜0.01*

negative correlation with the satisfaction level of security, and other variables like density of subway (0.097), office building (0.095) and the proportion of sidewalks<3m width (0.093), were positively associated with the perception of environmental security. At last, variables negatively correlated with comfort level of walking environment were also found, they were the density of population (-0.144), the proportion of commercial interfaces ≥15 stores per 100m (-0.135) and commercial interface (-0.131), and section-node ratio (-0.084), while the proportion of penetrable interface (0.126) and sidewalks<3m width (0.100) showed positive.

4.3 Regression Analysis

Compared to the correlation test, Multinomial Logistic Regression integrated more factors, especially those of social demographic attributes. These models contributed to find out the key factors that influenced the perception of walking environment. Respondents who rated "Extremely dissatisfied" and "Dissatisfied" were integrated to one level (the lowest assessment). And three logistic regression sub-models were made with the reference to this level. The dependent variable was the satisfaction of walking environment and the independent were all factors from social

Table 3: Basic Regression Model (Personal Attribute Variables only)

Social-demographical attributes	Change of Pseudo R Square	Sig. Value of Likelihood Ratio Test	B Value (When the Significance Level of Sig＜0.1)		
			Model 1	Model 2	Model 3
Age	0.024	0.000	0.562**	0.958**	1.029**
Gender	0.009	0.042	--	--	--
Monthly Income	0.006	0.142	--	--	--

*** p Value＜0.05, * 0.05＜p Value＜0.1*

demographic attributes and urban design aspects.

In the basic model, only three social demographic factors were selected (Table 3). Then, factors from urban design perspective were put into the model one by one and its contribution on pseudo R square was observed to evaluate the influence of the model. Meanwhile, the factors' parameter value (B) and significant value (Sig.) were observed to find out their effects on each sub-model. The result was listed in Table 4.

5 RESULT AND CONCLUSION

5.1 Factors associated with attitude toward walking

Based on the correlation test, this research found that one of the variables which was most negatively associated with the elderly's walking attitude was the width of sidewalks. It can be illustrated that 1) Wider sidewalks were usually along with the road with high traffic volume, which provided an alternative for the older citizens when they intended to go out. 2) Wider sidewalks were usually mix-used and other functions like the parking lot for bicycle may have influences on the elderly's walking activity, which led to a lower attitude toward walking as a whole. 3) The ratio of width and height of wider sidewalks may affect the space perception which would change the older adults' attitudes on walking.

Urban Design Factors		Change of Pseudo R Square	Sig. Value of Likelihood Ratio Test	B Value (When the Significance Level of Sig< 0.1)		
				Model 1	Model 2	Model 3
Spatial Texture	D. [a] Population	0.026	0.000			0.000*
	Average Block Length	0.005	0.075			
	Section-Node Ratio	0.011	0.001			
Land Use	D. Centralized Commercial	0.010	0.002			
	D. Commercial Interface	0.007	0.014			
	D. School	0.001	0.651	-0.082*		
	D. Office Building	0.001	0.239			
	D. Green Space	0.009	0.005	0.000**		
	D. Public Trans Station	0.007	0.008			
	D. Public Trans Route	0.001	0.609		-0.029**	-0.039**
	D. Subway	0.007	0.016		0.224*	
	P. [b] Commercial Interfaces ≥15 Stores	0.013	0.000			-0.029**
Interface	D. Entrance to Residential	0.001	0.526		0.007**	0.008**
	D. Entrance to Parks	0.007	0.017	-0.108**		
	P. Commercial Interface	0.014	0.000			
	P. Penetrable Interface	0.016	0.000		0.032*	0.053**
	P. Closed Interface	0.002	0.318			
Walking Facility	D. Walkable Area	0.001	0.670			
	Average Width of Sidewalks	0.004	0.124	-0.474**		
	P. Sidewalks <3m width	0.013	0.000		0.000*	0.000**
	P. Sidewalks ≥10m width	0.001	0.653			

*Notes: a. D means Density. b. means Proportion.** p Value <0.05, * 0.05 <p Value <0.1*

Table 4: Final Regression Model (Urban Design Variables included)

Positively correlated elements were the density of commercial and school. Shopping activities had been one of the most frequent behaviors that the elderly adopted in their daily life. This was also verified by the previous study (Huang and Wu, 2015) which concentrated on the elderly's travel behaviors in Shanghai. What is more, the outcome that the density of education facilities played a significant role on the elderly's walking attitude can be demonstrated that a large number of the elderly, instead of their adult offspring, picked up the kids from school. As a consequence, a higher attitude toward walking was observed.

5.2 Factors associated with perceived assessment on environment

Population density, commercial density, transportation facilities and the morphology interface are the key elements which influence the perceived assessment on environment. Specifically, the density of population showed negative correlation with the overall perceived assessment, the satisfaction level of security and comfort level of walking environment, while it positively correlated with the evaluation on convenience to the public transit. It can be inferred that 1) A higher population density was a challenge to the walking environment capacity as well as the secure of environment. 2) The amount of public transportation was stimulated by the increasing number of residents. As the public transit was one of destinations in the elderly's instrumental walking activity, the evaluation on this issue had little association with secure and comfort assessment.

The form of commercials was also an important factor which was associated with the assessment of walking environment. The proportion of commercial interfaces was negatively correlated to overall environmental perception, while the centralized commercial was positive. And the latter one also contributed to a higher level of assessment on security and comfort perception of the environment. Obviously, the centralized commercials were usually well managed and the surroundings were better than those of small retailers. Another key element is related to the public transportation. It is the density of bus route instead of the density of bus station that matters the assessment on convenience to the public transit. Meanwhile, the penetrable interfaces and the sidewalks in smaller scale (the density of sidewalks<3m width) were key elements of urban design that influenced the evaluation of the overall walking environment, security and comfort issues as well.

Multinomial logistic regression was taking various factors into consideration. Social demographical variable "monthly income" was eliminated from the basic model as it was not statistically significant. The basic model revealed that age was a significant variable from personal attributes. And the significance of age presented a raising effect with increasing level of satisfaction. Then, the urban design factors were put into the basic model and the changes of the pseudo R square, which indicated the fitting degree of the model, were calculated. The result showed that those variables which have the most significantly effects on assessment of walking environment were, the density of population (0.026), the proportion of penetrable interface (0.016), the density of commercials (0.014), the proportion of commercial interfaces≥15 stores per 100m (0.013), section-node ratio (0.013), and the density of centralized commercial (0.011). This research also found that, from three sub-models, the density of bus routes showed a higher negative effect on the satisfaction choice, compared to the lowest assessment of walking environment. It was a contradiction with the previous correlation test on the assessment on convenience to the public transit and it can be illustrated that the satisfaction level of walking environment were affected by both urban design factor (the density of bus routes) and personal attribute (age). Other factors, like the proportion of penetrable interface and the density of entrance to residential also showed the similar consequences.

6 DISCUSSION

Various urban design elements, especially those from urban texture and land use aspects, had influences on older adults' perception of the environment, which as a result leaded to changes in walking activity. Raising the density of population has drawn wider consensus because it brings about many benefits like improving the vitality of community, while it also has negative effect on the perception of walking environment among the elderly. It is same to the commercial issue, which is regarded as a double-edged sword. Commercial density, to some degrees, can contribute to a higher willingness toward walking and may decrease the perception of the walking environment. The results of regression analysis also spotlighted the importance of age factor in our routine walking environment and it also called for all to concentrate on the inclusive issues about the old people. Admittedly, many issues like making changes on the population density or commercials have been far beyond the urban designer's control, while making a good design from urban design perspectives, optimizing the built environment of neighborhoods as well as

calling for interventions from the authorities are much worthy to be done.

This research also has a number of limitations. As the questionnaires were designed for all age groups, few special attentions were paid to the elderly. Besides, the survey ignored the different types of walking activity, like for recreational purposes or instrumental purposes. So the result of analysis may be disturbed by other unknown factors. Statistically, the method of quantified analysis may be optimized by other analysis. Though with limitations, future studies are encouraged to take empirical studies to testify the existing urban design elements from this research.

ACKNOWLEDGEMENT

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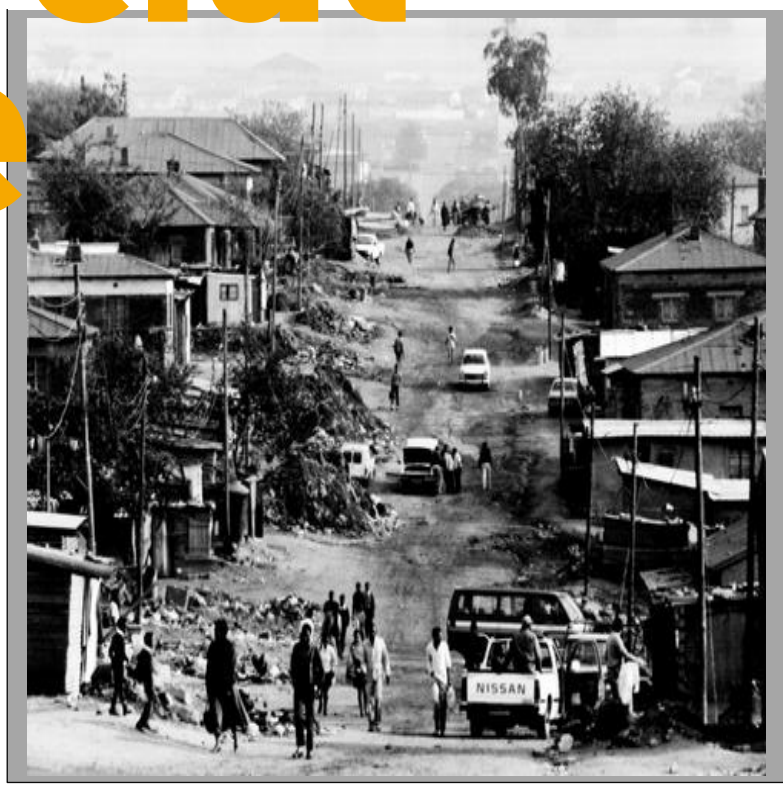
52ND ISOCARP CONGRESS

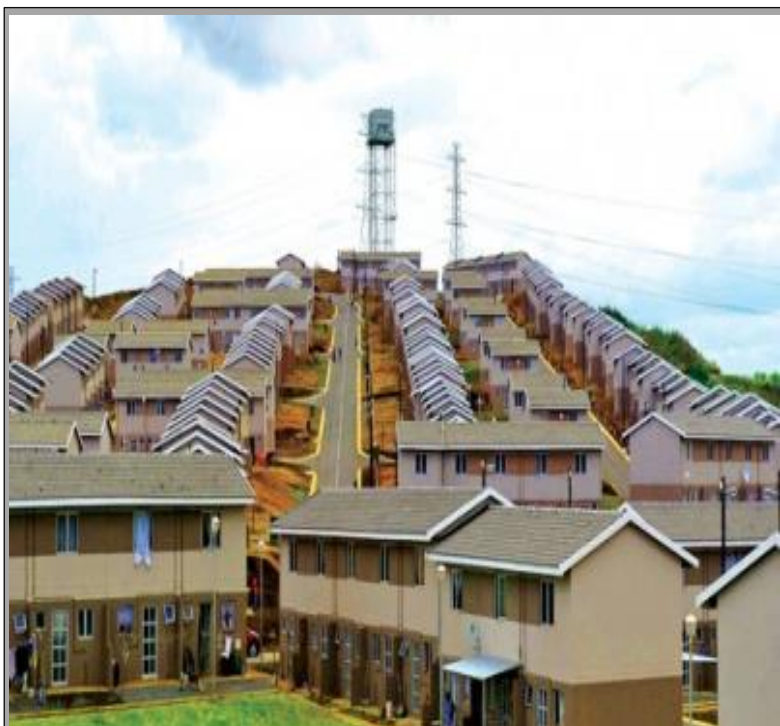
12 - 16 SEPTEMBER 2016
DURBAN, SOUTH AFRICA

"CITIES WE HAVE VS. CITIES WE NEED"

Track II

Planning activism and social justice





Final Report

by Brett Clavio (USA), Dorota Kamrowska-Zaluska (Poland), Thulisile Mphambukeli (South Africa)

Track Two involved a discussion of 'the cities we have versus the cities we need' in relation to Social Justice and Planning Activism. Social Justice as defined is the just behaviour or treatment of people in society, and the idea of social justice relates to the many struggles of people. The profession of Planning has emerged as an agency of intervention and change on behalf of social justice, including spatial justice, economic justice, environmental justice and justice in public policy.

The interventions of planning activism for social justice are largely a call for inclusiveness and for empowering a disaffected public to participate in public planning and public policy. Inclusive participation was reported to not only strengthen the community but also the outcomes of the proposed actions. The research in this track discussed a broad range of planning topics on social justice, from reconciling institutionalized injustices to advocating for empowerment for those otherwise disenfranchised by political and economic systems.

Through the overall congress proceedings and exemplified in this track, the transformation into a more inclusive society occurs through a process of personal and social evolution. Constitutions, laws and behaviours with respect to social justice change through processes of ethical maturity. For instance, the decolonization process of South Africa was discussed as needing to end the colonial or authoritarian mind-set. The process of legalizing and integrating informal settlements, informal economies, and informal transportation were discussed as a means to redress the social injustices of the past.

The act of inclusion in planning and policy making is still needed, particularly for people living in traditional tribal communities who continue to lack empowered representation in the planning and governance process and who face a continuation of social injustices around the world. The evolution of a decolonization process should include a layering of traditional and modern knowledge and leadership to achieve a mutual benefit and a win:win situation with a pluralistic society and economy. Also discussed was that formalized, static settlements and land uses of western planning doctrines may be more unsustainable in comparison to tribal standards that involve moving around the land, flowing with nature in more nomadic and seasonal ways.

In Session 1, themes of Planning and Social Justice were reported on. It was stated that as change agents, planners must influence and advocate for updated policy and legislation to address social injustice and spatial inequities. Dimensions of social injustice and exclusion ranged from poor and unsafe mobility options through poor affordable housing choices up to poor planning practices.

Source: presentation of Renee Hulley

Source: presentation of Oriyomi Akinyemi

Source: presentation of Mikhail Malashenko

In Session 2, authors reported on themes of Social Structures involving social-spatial dissonance and injustices in socio-economic systems. For example:

> "From a western, materialistic perspective, land is a commodity, an asset, but from an African perspective land is multidimensional, layered in cultural and social rights. It is a space that encompasses the past, present and future...This ownership, tenure and land use are perceived differently by different cultures. These cultural lenses influence planning as their unconscious assumption of a specific cultural perspective affects planners' approach to land and planning (Williams, et. al).

Elite-capital style planning and socio-economic systems were critiqued as undemocratic, while participatory planning and socio-economic systems such as common-pool resourcing were shown as successful. The old authoritarian, arbitrary, colonial rule was shown as unjust and is still being replaced with a more democratic, people-based morality. For example, the case of the human right to a security of housing and the new South Africa's progressive due-process for evictions of any dwelling, including informal settlements.

In Session 3, themes of Public Policy and Capacity Building were reported on. Papers from South Africa called for a need to build capacity amongst existing and future planners, as well as other stakeholders to carry out a more proactive, 'developmental' approach at fixing the country's planning problems. For example:

> "The socio-economic disparities have meant that a state that starts and ends at being democratic is not responsive to present society and therefore irrelevant...It was on this basis of understanding that ours as South Africa goes beyond mere democracy, but to be a democratic and a developmental state...A democratic developmental state is one that not only embodies the principle of electoral democracy, but also ensures citizens participation in the development and governance process." (Zulu)

> "Whilst the overall objective of informal sector development is well-run business and ultimately paying tax, the government messaging should be more developmental, highlighting issues of sanitation, health and standards of their products." (Hulley)

Authors in session 4 reported on themes of Economic Justice, pointing out examples of corruption and exploitation, but also indicating how to achieve mutual benefit and value exchange. Social justice here means that public investment should serve its intended use and have support of the local community. Mega commercial investment projects should serve a greater cultural and social development need. Foreign development aid money should more completely benefit the projects and the communities intended for, without the money siphoning from projects to politics. In a Nigerian case, we hear that informal settlements and slums in Lagos have been a consequence of both market and government failures. In a case from China, some landlords are shown to take advantage of the affordable housing shortage with migratory tenants, causing ghettoization of the neighbourhood in the process. In a Turkish case, some public coastal lands and public access to them were sold off for a private master-planned marina development where the developers win and the public and the ecology of the place loses.

In Session 5, Planning Activism was discussed. The planner is activated as an empowered agent of change, further enhanced by being an activist.

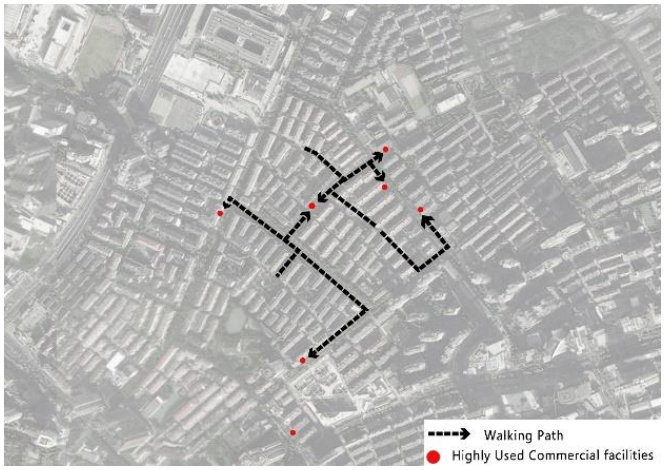
Source: presentation of Meidesta Pitria

Planners promoting participatory approaches for community-building empower people and their sense of community. On planning activism for social justice, it was argued that using soft power was more successful (e.g. in Russia), by advocating for the good rather than protesting about the bad. Being positive, patient, and inclusive are good strategies for activism. A new tool for planning activism is internet-based Social Media, which can be used to organize actions and market causes.

In Session 6, authors addressed Inclusive Planning, showing how informal developments, informal house extensions, and informal economies can be integrated into a formal community by allowing flexibility for a continuous settlement process, recognizing an idea of no fixed planning from the temporal beginning or the ending of the physical space. Allowing for informal developments and making communities walkable and enjoyable for people of all age groups and abilities were seen as significant factors for achieving the cities we want. A policy promoting small scale neighbourhood commercial and social activities is also vital for the the cities we want, accommodating natural, basic pedestrian social and economic marketplace flows.

To get the more inclusive, sustainable cities and habitat and to reduce social injustices, authoritarianism and colonization, we need a personal and social empowerment, a moral evolution and a legitimization of the rights of all people. We need a progressive transformation of ethics and justice on the spatial and psychological landscapes.

Track Two described methods for achieving the freer and more inclusive cities and habitat we want. The African Renaissance shines on the new South African planning experience by creating new freedom in cities, an ethical evolution, and a renewed energy for a more just and inclusive society and economy.



Source: presentation of Genrong Cao

Transportation challenges in cities in developing countries: case study of Nairobi, Kenya

Francisco ACHWOKA, Kenya

This paper aims to critically analyse the urban transportation problems in Nairobi, Kenya, as a case in point of transportation challenges in cities in developing countries. Identifying and resolving transportation problems is a key issue challenging governments in most developing economies like Kenya. Despite increased expenditures on urban transport systems, the current transportation problems continue to worsen due to poor execution of transportation planning models and ideas, lack of supportive governance structures and ultimately corruption within the overall transport sector. This puts developing countries at a significant disadvantage with the lack of efficient and safe transportation being a major crisis (Klopp, 2012).

In Kenya, urban transportation problems have been dealt with by the construction of larger roads, by-passes and broader dual carriage ways. However, these road projects have not been a solution as they have proven to be unable to achieve the broader plan of traffic management. Road projects need to be part of an overall transportation plan that includes traffic management and transit systems that majorly support public transportation. Similarly, this needs to fit into a broader metropolitan urban plan. This paper will seek to highlight this as a core planning problem leading to the failure of the city's transportation policy. It will offer direction towards the development and management of the public transportation system that will provide a higher level of mobility, equity and environmental sustainability.

INTRODUCTION

Introduction to the problem and research motivation

Increased poverty levels in the rural areas and rapid urbanization of Sub-Saharan African towns in the last decade has caused migration to cities. As such cities, which are already struggling with provision of vital social amenities such as housing and infrastructures, are further tasked with ensuring affordable public transportation for the growing populations. The high cost of private transportation leads to the dependence on public transportation by the populations for accessibility and mobility to work places, markets and residential areas. Public transportation, hence does not only become just a social amenity, or an alternative to private car travel, but remains as an only means to a motorized mode of transport available to the vast majority of the urban population in many African cities (Koster, 1999).

Transportation policies and projects have taken shape in various forms within the continent through substantial financial and infrastructural investments involving foreign development partners in the form of road building, rail and provision of various incentives on transportation-related infrastructure to both the government and private sector. However, these projects have caused significant public debt as they have been majorly financed by foreign loans and encountered corrupt systems within government institutions (Klopp, 2012).

Transportation policies have a long term impact on how cities grow into the future, with practices that further impact land use, environmental and economic aspects and overall quality of life in cities. If done well, transportation policies and projects can have a beneficial impact on improving equity, efficiency and overall quality of urban life. However, if done poorly, they can intensify struggles over urban land and space, contributing to the lowering

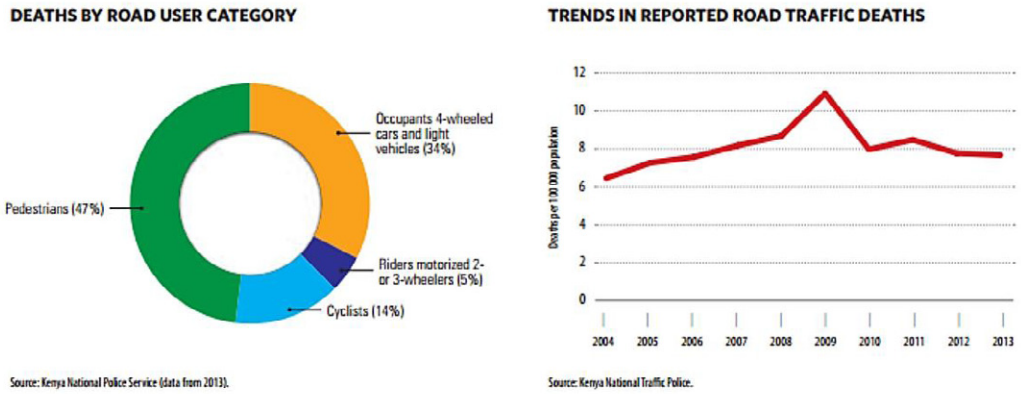


Fig 1. Deaths on Kenyan roads. (Source; WHO Global Status Report on Road Safety, 2015)

of the city's liveability and further escalating the poverty levels (Pieterse, 2010).

The Nairobi Metropolitan region constitutes Eastern Africa's largest metropolis and has rapidly grown and expanded into the surrounding towns, a wildlife corridor and the agricultural lands that form part of its periphery (UNEP, 2009). Having its own unique historical development and dynamics, the region stands out as an urban space requiring critical analysis when theorizing its transportation issues. Historically, there have been endemic factors interrelated to the decision making on transport policies and projects in Nairobi. Klopp (2012) lists some of these factors that include:

a) The large and distorting role of the external actors, e.g., donor agencies and development partners.

b) The fragmentation in institutions, policymaking and projects.

c) The closed and top-down planning processes.

d) The absence of mobilization of projects and policies that serve the majority of the residents, especially in the poorer segments, have tended to favour\ the richer, well-to-do minority.

Currently, Nairobi faces problematic dynamics of poverty and social segregation with a high rate of urbanization of 4% per year. This means that like many other African cities, Nairobi has higher population growth rates than cities in Europe at an average rate of 3 % (Burdett et al, 2015) (Arku, 2009:254). Statistics suggest resident populations of 3.2 million with up to a daytime population of 4.2 million (Kenya National Bureau of Statistics, 2010). Increased environmental pollution due to oil dependency, industrialization, deforestation, inefficient waste management, encroachment and contamination of agricultural lands have led to reduced air quality in the city and further exacerbated environmental impacts in its environs (Odhiambo et al., 2010). In addition to a rapid urban population growth due to rural-urban migration, the number of cars owned and level of automobile use within the city is growing due to liberalization of car imports among other factors. According to the WHO Global Status Report in Road Safety (2010), nearly one third of the 3,000 to 13,000 lives lost in Kenyan roads are commuters; many of them killed in unsafe forms of public transportation.[1]

Thus, cities in developing countries like Kenya in the Global South remain at a significant disadvantage with the lack of efficient and safe transportation being a major crisis leading ultimately to an increase in the number of traffic-related fatalities (Klopp, 2012).[2]

The plethora of inter-related urban challenges in Nairobi and possibly, in cities in other developing countries calls for a change in existing policies and practices around public transportation and land use. The lack of adequate information, efficient planning frameworks and forecasting to guide decision making has led to the application of inappropriate systems, that are based on those seen to work in the developed countries in the hope of local success. This has not always been the case, and their continued failure has led to the profit-driven private sector dominating public transportation. This comes at a significant disadvantage to the countries' poor, generating social exclusion as the

1 According to the National Transport and Safety Authority, Kenya, there were nearly 3,000 recorded deaths due to traffic accidents in 2014, the majority of which were pedestrian fatalities, estimated at 59% of these deaths

2 'Global South' is generally used in reference to the low- and middle-income countries that are largely located in the Southern hemisphere. It is distinguished from the Global North, which refers to the economically advanced high-income countries of the world that are by and large located in the northern hemisphere. For more on terminology of classifying countries of the world, see Harris et al. (2009).

	Car (%)	Bus and coach (%)	Rail (%)	Passenger kms per capita
Great Britain	88.1	6.4	5.5	12 430
France	86.7	4.7	8.6	14 283
Germany	82.7	8.9	8.4	10 276
Japan [a]	61.5	7.0	31.5	9 592
USA [a]	96.2	3.5	0.3	23 388

a 2001 data. Table 1. Passenger transport shares in selected countries (2002) Source: UK Department for Transport. (DfT) (2005). Transport Statistics. London: DfT. Tables 10.1 and 10.6

increase in transportation costs leads to decrease in uptake of transportation services by the poor.[3]

Thus, it is imperative that a government meets its responsibility of ensuring that public transportation meets the needs of all the citizens. Governments in developing countries need to use precise and relevant performance indicators that will give a clear overview of the public transportation systems of the cities and help in monitoring the benefits of implementing efficient transportation policies and projects to improve transport systems. There is therefore a need for decision makers to assess, evaluate and improve public transportation systems in African cities for further planning and mitigation of growing inequalities.

Identifying and resolving transportation problems is a key issue challenging governments in most developing economies like Kenya. Despite increased expenditures on improving urban transport systems, the current transportation problems continue to worsen due to poor execution of transportation planning models and ideas, lack of supportive governance structures and ultimately corruption within the overall transport sector. The main aim of the paper is to describe, discuss and assess the challenges facing public transportation systems in developing countries and propose overarching solutions. It will critically analyse the urban transportation problems in Nairobi, Kenya, as a case in point for transportation problems in cities in developing countries.

The methodology is based on the observation of a set of performance indicators such as the income per capita, population density, area and car ownership and related benchmarks used in the evaluation of the transport system of a city, against goals such as sustainable development, environmental sustainability, efficiency, accessibility and mobility, which are components of successful transportation policies. Eventually, it will theorise a framework of public transport being used to reduce social exclusion

The literature review aims to identify specific aspects of public transportation, and develop a forecast based on the methodology used to describe, discuss and evaluate the public transport system. It will also include also a review on transport plans and interventions made for the city of Nairobi by the various stakeholders. This will lead to a conclusion on how developing countries can achieve sustainable systems.

This paper targets two main audiences: (a) urban transport sustainability researchers, who are seeking a review of academic literature and state-of-the-art practice; and (b) policy-makers (and politicians) in developing countries, seeking an overview of practice that can be used to inform the development of new urban transport strategies

A useful distinction has to be made within the role of public transport and its operations in developing and developed countries. In developed countries, absolute levels of public transport use peaked during or after World War II, particularly bus transport and over the years, the mass transit systems like the bus and light rail transit systems (Preston, 2009). However, current trends reflected a decline in the importance of public transport due to increase in private car ownership.

The reduced market share of public transport is visible in most developed countries' passenger markets though there are still large variations within mobility levels and modal shares as seen below in Table 1. Transport infrastructure that was planned for mass transit models has led to concerted efforts to increase demand for public transportation so as to keep the investments viable and increase sustainable transport. This is through promotion of public transport through increasing frequency of transportation, pulling back on incentives to private motoring like fuel subsidies that favour motorists among others.

3 Social exclusion, as a theoretical concept, acknowledges that the causes of the undesired alienation of certain individuals from their society, can lie within the individual, the society or in this case, the State (Duffy, 1995).

Whereas the problems of public transport in developed countries are associated with insufficient and declining demand, in developing countries problems tend to be associated with growing demand and insufficient supply. Public transport use is often high, rail provision is limited, and conventional bus services are overcrowded, unreliable, and slow. Bus fleets are often characterized by high failure rates, due to inadequate investment in vehicles and maintenance facilities and a shortage of spare parts (which often have to be imported). Paratransit services of various types and various degrees of legality have often emerged to satisfy unmet demand. Examples include jeepneys in the Philippines, dolmus in Turkey, kombivans in South Africa, and matatus in Kenya.[4]

These modes are sometimes referred to as informal or unconventional public transport. With respect to long-distance passenger transport, rail plays an important role in countries such as China and India, however, it has a less important role in Latin America and Africa. Cervero and Golub (2007) suggest that in much of Africa and in smaller Asian cities where municipal budgets are stretched thin and where technical capacities for planning, administration and regulation are insufficient, informal transport is almost by default the only dependable available service. An earlier study by Golub (2005) confirmed that, in many cities, regular public transportation systems do not meet all of the demands of the marketplace and thus small-scale operators, legally or illegally, enter the market to fill these gaps. They tend to complement regular transit services or serve areas or populations not traditionally serviced by regular services, and they can be extremely efficient and responsive to market demands and changes

Transportation in developing countries can be analysed from various disciplinary and theoretical standpoints. Academic work on public transport in developing countries has mainly been dominated by transport economists, whose quantitative measures tend to downplay the spatial nature of the issues. The key contribution by spatial planners however, has been to highlight the spatial aspects of some economic concepts such as public transport demand, supply prices, investment, regulation and ownership.

Some of these spatial aspects are seen in the consequences of unplanned developments in transportation infrastructure resulting from the lack of or a misunderstanding of the planning concepts. The others are developments against spatial plans already under operation. The lack of a planning tradition in many developing countries causes resistance towards the workable planning concepts and reduces the effects of the efforts made in favour of planned development. Whereas planning approaches are also criticised in developed countries, where there are planning traditions and where planned developments are under operation, most of the criticism centres on methodology and instruments (Genton, 1971; Wachs, 1985).

Additionally, most of the criticism focuses on demand predictions, which lie in the centre of the classical planning processes. Talvitie (1997), who approaches the subject from a philosophical direction and bases his ideas on economical and psychoanalytic theories, believes that transportation and societal planning is extensive far beyond the individuals' economical behaviour. He proposes that the utility function should be expanded beyond the limits of economical behaviour. He stresses that the following three questions should be positively answered because of the important role of demand prediction in planning:

1. Can socio-demography, land use and travel demands be forecast as a function of observable variables?

2. Can stable goals and plans be formulated, satisfying both the goals and predictions?

3. Has a tractable process been devised for implementing the plan?

Planning problems are deeper in the developing countries. Without the necessary tradition and the past experiences, the planning efforts cannot yield the best results in a short period of time. First of all, the planning concept should be adopted and assimilated. The question is not "why planning?" This stage is over. The questions of "what kind of plan" and what kind of application" are the ones that need answers

CONCEPTUAL FRAMEWORK; TRANSPORT DISADVANTAGE AND SOCIAL EXCLUSION

The study of transport as a cause of social exclusion (Duffy, 1995) highlights that individual's accessibility, mobility and activity participation are often constrained by a number of shortcomings in land use or transport systems, other than just their ability to pay for motorized mobility (Hine and

4 These are 14- seater mini-vans that take passengers from the suburbs of the city to the central business district. They have two individuals running them as a driver and a conductor charging fares and run within specific routes.

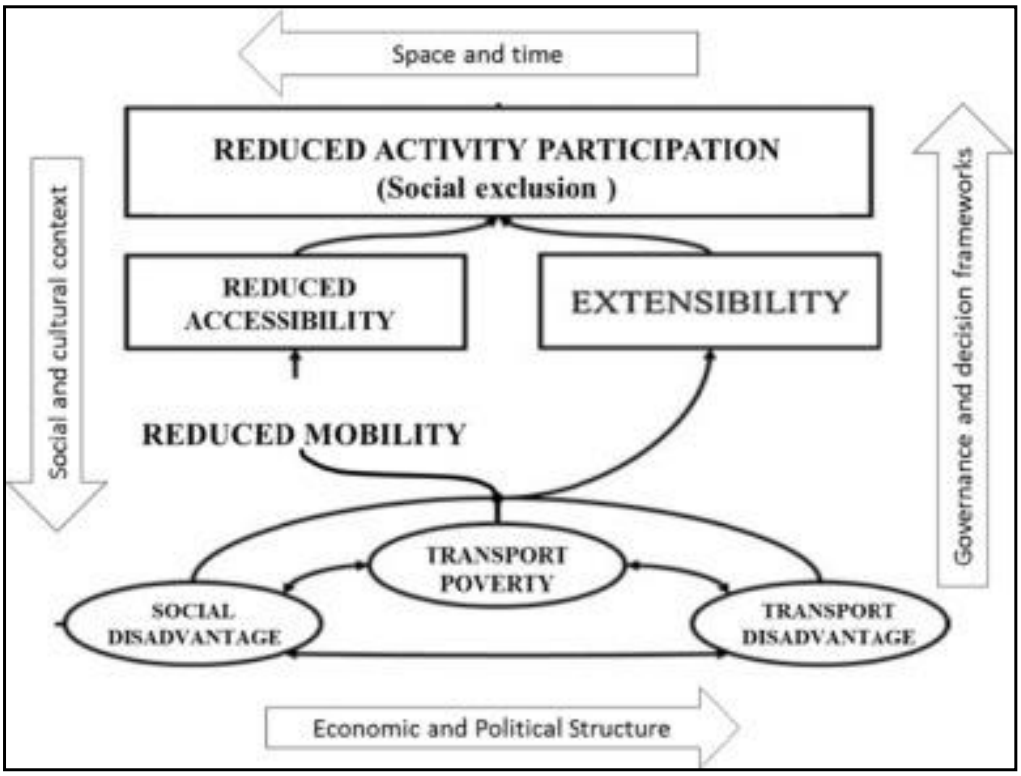


Fig. 2. An activity based perspective on the relationship between transport disadvantage and social exclusion: Based on Páez and Farber (2012) (for variables in rectangles and overall flows) and Lucas (2012) (for broad contexts given in arrows and variables in oval variables) showing reduced mobility. Source; Adeel, 2015

Mitchell.2003). Social and transport disadvantages combine to create transport poverty (Lucas, 2012) and this leads the inaccessibility of essential services, potentially leading to exclusion. In cities of developing countries, urban transport needs of all social groups are rarely met leading to social exclusion. The cause may be in the lack of understanding of such needs, a lack of awareness of the transport trends or simply, lack of action from key stakeholders in providing a solution for the social groups at a significant disadvantage. Hence, the negative effects of the unsustainable transport systems affect the poor disproportionately (Badami, 2007).

The travel patterns of different groups in society reveal that most trips taken are by individuals with higher income than by those with lower income. This is mostly due to the fact that most individuals in low income groups do not have capacity in money or time to travel more. This further weighs heavily on their capacity to access jobs, education, health and all other services that a city can provide, reducing their participation in society as a whole (Thynell, 2009). Similarly, there's less accessibility for lower income groups due to high/unequitable transport fares, lack of public transport provision to areas of lower income populations, and lack of safe infrastructure including facilities for Non-Motorized Transport (NMT) and pedestrians. Similarly, the patterns of low income women vary from those of the men. Men are able to take pendular trips (one trip in the morning, and one in the evening) while women are mostly taking trip chains (various short trips chained to one another) and using non-motorised modes of transport (walking, cycling). Overly, one can hence see that social disadvantage, which is described by personal and household socioeconomic status, and transport disadvantage, which is explained by access to land use and public transport resources, interact with each other to create transport poverty. All three elements lead to reduced spatial mobility and thus reduced accessibility and limited activity participation, resulting in generating new or exacerbating the existing level of exclusion. This study builds from the conceptual relationship between transport disadvantage and social exclusion, studied by Paez and Farber (2012) and Lucas (2012). Additionally, limited material welfare and poor infrastructure further intensify exclusion.

CASE STUDY: NAIROBI

Nairobi is the capital city of Kenya, in East Africa, the second fastest growing regional economy in Africa (IMF, 2013). It is the country's commercial hub accounting for about two-thirds of Kenya's $ 41 billion annual economic output projected to grow by 5.8 percent (GoK, 2013). According to the United Nations, the country's annual urbanization rate stands at 4.3 percent from 2010 to 2015, which is more than double the global average of 2 % and above the African average of 3.6%. It joins the growing number of cities across Africa, Asia and

Fig 3.0 The road network in Nairobi is primarily composed of radial routes connecting surrounding regions to the CBD. The lack of circumferential roads forces many peripheral trips through the center. Source; Gonzales et al, 2013

Fig 3.1 The street network of central Nairobi is restricted by intersections through which all traffic entering and exiting the CBD must pass. Only 13 of the intersections in the city center are controlled with traffic signals. Source; Gonzales et al, 2013

South America facing challenges in transportation amidst rapid urbanization.

Until recently, Nairobi lacked strong innovative strategies for addressing the rising challenges in transportation. Nairobi's ratio of 11 percent of land dedicated to roads is below the 30 percent yardstick referenced globally. The city faces a challenge of congested roads due to its limited road capacity for a third of its current population, 3.2 million set to balloon to 15 million in 2050 (WEF, 2015)[5]. The more than doubling of the number of vehicles on Nairobi's roads since 2012 to 700,000, has not been matched by infrastructure and traffic management. The city is not ready for as many as the predicted 9 million car users by 2050 (GoK, 2014).

As earlier highlighted, public-transit in Nairobi is mainly through a fleet of 20,000 privately owned minibuses known as 'matatus' that are notorious for not being roadworthy and disregarding highway laws. This leaves the lower-income residents with a public transportation system that is both inadequate and unsafe. Walking has become the only affordable option for many, leading to 59% of road fatalities being pedestrians (Ongedi et al, 2013)6. Similarly, the nearing completion of by-passes designed to divert traffic from the city centre is favouring the increase in demand for cars as opposed to promoting NMT.

With rapid urbanisation and economic growth, motorization has been accelerating with many of the middle and upper class residents acquiring cars. Owning a car has moved from being an aspiration to being a need. However, by most indications, drivers and pedestrians are still testing the bounds of road innovations. Traffic jams that cost 50 million shillings ($578,000) a day in lost productivity, are endemic during both peak and off-peak periods (Kiarie, 2015)[7]. The traffic police, a corruption prone institution according to the 2013 Transparency International survey, benefit financially from the existing situation of transportation.

According to a 2009 report by the Ministry of Transport (MoT), the Kenyan public transport sector faces challenges like poor quality of transport services; inappropriate modal split; an unexploited regional role of the transport system not being fully integrated. This causes urban environmental pollution; lacks an urban/rural transport policy; has institutional deficiencies, inadequate human resource capacity and lack of a vision for the transport sector. Additionally, challenges like inadequate infrastructure, high costs, poor safety and inefficiency not only hinder the performance of the transport sector but also jeopardize efforts to attract investors into the public transport sector.

On a spatial-economic front, Nairobi's physical street structure has contributed to its congestion. There is an exclusive focus on access to the Central Business District (CBD) for socio-economic activities by most of residents from 5 a.m. to 8 p.m. The streets consist primarily of paved roads emanating radially from the centre of the city to the surrounding suburbs. The few streets cannot serve traffic demand relative to cities of similar size of Nairobi's motorised traffic. There are only a handful of roads linking the radial arterials outside of the CBD as shown in figures 3.0 and 3.1 below.

Major intersections are managed by traffic circles (roundabouts) and there are no signalised intersection outside of the CBD. This leads to concentration of vehicles on limited infrastructure and the lack of street connections that create the

5 The World Economic Forum (WEF) Global Risks Perception Survey 2014 calculated a fivefold increase in World Urbanization Prospects data

6 The World Bank Road and Highways Safety Report estimates 60% of road fatalities are pedestrian cases in developing countries

7 Report of Traffic Decongestion Committee, Nairobi County 2014

redundancy needed to ease traffic congestion (Gonzales et al, 2013).

LITERATURE REVIEW

Despite inclusion of sustainable transport development in national plans and policies and efforts made so far, the progress on the ground in most developing countries is far from satisfactory. Political commitments and the current level of efforts may not be sufficient for persistent sustainable transport development. A review of relevant documents on current practices, administrative arrangements and institutional issues in selected developing countries reveals that so far institutional issues in sustainable transport development have drawn much less attention. These issues are related to the institutional environment, comprising overall transport sector governance including planning, policy formulation, resource allocation, and coordination among multiple actors involved in transport development. A keen inspection of the various policy documents on Nairobi's transport policy reveals numerous substantive interventions, which are not matched by a corresponding drive towards implementation. These observations are outlined below.

A report on Integrated National Transport Policy: Moving a Working Nation

This national transport strategy defines the policy and covers many fields beyond infrastructure. All person and cargo modes are included and environmental effects, road safety, education and health issues are dealt with in separate chapters (Ministry of Transport, 2009). To call the plan 'integrated' is fully justified. The policy openly addresses problems, emphasizes the role of all modes, proposes modern economic measures like the user-pays-principle and values the economic benefits and potential of NMT.

Due to the diverse conditions in rural and urban areas of Kenya, its use for Nairobi is limited. However, it demands a separate urban transport policy for Nairobi and other Kenyan towns, which should aim at developing an integrated, balanced and environmentally sound urban transport system (Ministry of Transport, 2009: 29). The national plan could act as a good model for any other region in Kenya as a plan.

Road Sector Investment Programme & Strategy 2010 – 2024

This is the newest document on transportation planning in Kenya and it lists precisely the future road investments on a nationwide basis. It justifies the reasons for investments in the road sector, describes ways of financing them (including the 'user pays' principle), proposes an institutional framework and allocates funding to organizations, road types and specific projects (Ministry of Roads, 2010). The traffic growth forecast for 2030 does not include NMT at all as an urban mode (Ministry of Roads 2010: 32). Although regular road projects can be expected to include financial resources for NMT, the share of the budget for separate NMT-facilities of 0.13 % of the total budget till 2024 is rather low (Ministry of Roads 2010: 47).

Nairobi Metro 2030

The policy document, published by the erstwhile Ministry of Nairobi Metropolitan Development, is a general strategy for different types of politics and planning. Transport is addressed on six pages, making general statements about road infrastructure, mass rapid transit, logistics and land use. NMT barely plays a role in this general plan. In the transport section, it simply notes "...a critical concern is to ensure adequate provision for metropolitan wide non-motorized transport, mobility network." While proposing a mass rapid transit program, the statement is made "...Rail transport increases penetration of the city centre, and is particularly effective in reducing walking distances" (Ministry of Nairobi Metropolitan Development 2008: 63). Usually, rail transport, compared to other forms of public transportation, is associated with large catchment areas and therefore long walking distances. However, Nairobi's distance of only 30 km lengthwise does not suffice the threshold for commuter rail transport as referenced above

THE STUDY ON MASTER PLAN FOR URBAN TRANSPORT IN THE NAIROBI METROPOLITAN AREA, KENYA

The majority of all current investments in the road infrastructure of Nairobi are summarised on a comprehensive study on transport planning that was funded by the Japan International Co-operation Agency in 2006. Japanese development assistance provided funds for feasibility studies on various infrastructural projects and the study similarly comes as a broad analysis of the present condition of transportation in Nairobi region, covering fields like national and economic development, inventories of the supply side, which involves organizations, financial aspects and traffic surveys and counts. Based on an economic growth rate of 4.6 % and population growth rate of 2.1 %, a macroscopic model is employed for a forecast till 2025. A wide variety of measurements are examined and specific alternatives are demonstrated. It

includes the investments on infrastructure of 43.4 Billion Kenyan Shilling ($ 460, 000, 000) from 2006 till 2025 (JICA, 2006). NMT is mentioned in the report, with the dependency of the urban poor on NMT being pointed out and the large role it plays in terms of modal split emphasized. However, the appraisal of NMT in the plan does not correspond to its importance. It is stated as a component of many measures, but always as among 'other aspects to consider'. Neither are the different needs of cycling and walking populations taken into consideration. Similarly, quality standards besides the width of NMT lanes are not defined. With those general conditions, it is surprising that the modal share of NMT is forecasted to decrease from 49 % to 44 % by 2025. This should not be the case; it should increase.

Overall, the plan can be rated as a supply-oriented approach, which is two to three decades behind modern planning principles like the Sustainable Urban Mobility Plans (Bührmann et al. 2011) in the European Union.

In conclusion, institutional issues concerning sustainable transport development need greater attention. Many barriers to sustainable urban transport development in developing countries are mainly institutional in nature. Deficiencies present in transportation institutions, particularly laws, regulations, rules, and institutional governance outlining how formal and informal transport operations should function, interact with consumers and involve stakeholders are huge barriers to sustainable development in transportation.

DISCUSSION

The eradication of traffic congestion for the purpose of solely enhancing public transport is not affordable especially in economically dynamic urban areas such as Nairobi. The expansion road infrastructure has been costly having wide-ranging economic, social and environmental effects. Hence, proposed solutions to transport related problems should be based on a careful selection of a strategic mix of measures that would have been rigorously tested. Contextually, in terms of cost and time, some measures may not be effective, hence if considered, they require joint application. Within Nairobi, it is necessary to consider;

> What is the best mix of road traffic mitigation measures for Nairobi?

> Will traffic congestion mitigation measures used reduce traffic congestion and by how much

> Are the mitigation measures sustainable and cost effective now and into the future?

Research done by the Kenya Institute for Public Policy Research and Analysis (KIPPRA) in 2011 on mitigating road traffic congestion in the Nairobi metropolitan region highlights the following findings;

> Increasing the road capacity would reduce overall traffic congestion in the interim, however this increase may not be economically feasible.

> Strategies to promote a modal shift from private car to public transport and increasing the vehicle carrying capacity would reduce the overall congestion in the city by 41%

> Building the bypass roads would reduce traffic congestion by 11% while decentralising the CBD would have the least effect in reducing traffic congestion (10.7%)

> However, if all the mitigation measures were implemented in a combined strategy addressing the demand and supply side, overall traffic congestion would be reduced by 76%.

The results also indicate that time-oriented mitigation measures such as flexible working schedules (flexi-time) have the potential to reduce traffic congestion because of the temporal behaviour of peak traffic. Utilising this concept of flexi-time is based on the assumption that in many work situations, rigid arrival and departure times are not necessary and could be adapted into a more flexible system. For instance, a business may be open from 7:00 a.m. to 6:00 p.m., with all employees present from 9:00 a.m. to 3:00 p.m. arriving between 7:00 am and 9:00 a.m. and departing between 3:00 p.m. and 6:00 p.m. (Gachanja, 2011)

However, as is with most policy and plans for sustainable urban transport, the findings lead to the same conclusion of the need to establish the potential role and impact of nine commonly considered options for provision of sustainable urban transport in rapidly urbanizing cities located in developing countries: (1) increasing road infrastructure; (2) introducing rail-based public transport; (3) regulating road-based public transport; (4) support for non-motorized travel modes; (5) technological solutions; (6) awareness-raising campaigns; (7) pricing mechanisms; (8) imposing vehicle access restrictions; and (9) control of land uses.

These options for action are overlapping and interconnected. They cover both the demand and the supply side of urban transport with a focus on the latter. However, most developing countries lack the necessary GDP and expenditure budgets to facilitate the adequate mixes as recommended by the study, and rely on development loans. Coupled with the widespread corruption within the responsible actors, complete implementation is still an ongoing challenge. Hence the institutional environment for sustainable transport development should be conditioned to ensure consistent coordination of actions for the desired results.

Furthermore, given that transport demand is a derived demand, complementary interventions in related sectors may be required in order to make transport development more inclusive and to realize its full potential to support the development process. These tasks can be rather challenging for various reasons, especially owing to deficiencies in the institutional environment comprising laws, regulations, rules, and governance institutions outlining how organizations function and conduct dealings with other organizations and stakeholders. Considering the importance of the institutional environment to sustainable transport development, this paper also proposes an understanding of institutional issues that may stand as barriers seriously limiting the progress on sustainable transport development by planners.

In the absence of an institutional mechanism, typically transport development decisions, planning and policy formulation, and coordination of actions between responsible agencies are undertaken within a setting which is deficient to address the consistency of policies, plans and programmes and coordination of action by multiple actors. The success of transport planning and policies depend greatly on the institutional environment within which they are prepared and implemented.

There are three main elements that comprise the institutional environment. These include:

a) Governance institutions that define the distribution of power and authority between levels of governments, organizations, and other actors. They also specify rules of business for organizations including how they conduct dealings with other organizations and actors

b) The legal institutions that refer to statutes, constitutional provisions, laws, regulations and rules, and high level administrative orders governing the sector

c) Social and organizational culture within which the organizations and other stakeholders play their role. It also includes personal and group dynamic relationship between the organizations and the private sector, and various pressure groups that influence the decision environment and the allocation of resources.

However, according to Williamson (1994), there is need for inclusion of another type of institution; the informal ones, especially in the case of developing countries. A participatory framework that includes paratransit stakeholders is crucial in the formation of sustainable transport development initiatives.

RECOMMENDATIONS

Transit Oriented Development (TOD) can be an effective strategy for guiding cities in developing countries towards sustainable urban transport development. However, TOD is rarely adopted in urban planning and transportation planning practices in cities of developing countries effectively as most cities were planned with central zones with limited capacity for decentralisation (Qulum, 2014). Effective TOD requires an appropriate type of development control along the transit corridors and other complementary measures, which are generally administered by a land use control authority. TOD and development control together with measures for land value capture along the transit corridor can support the development of an effective high-capacity transit system and also provide for its funding, at least in part.

It is debatable whether rail-based public transport should be emphasized in developing countries' cities. Mobility patterns are influenced by both population size and population density, especially the latter. Urban sprawl has a significant effect on travel distances and hinders public transport supply. In urban areas with dispersed populations, the provision of either rail-based over road-based public transport might not be economically viable (Haghenas H, 2012). In particular, rail should have a definite advantage over road-based systems to justify implementation in cities with small and/or dispersed suburbs, since new rail systems are very expensive to construct and operate. A full cost-benefit analysis of both options should guide decision-making. Investments in new LRT systems in medium-sized developing cities may have limited economic and practical value. Due their high costs, developing countries often can only construct such systems over a few kilometers in a few limited corridors, which do not meet the broader transport

needs of the population. Nevertheless, the public sector may end up with a long-term debt that can affect investment in more pressing policy areas (Wright, 2007).

Informal paratransit services, while providing benefits including on-demand mobility for the transit-dependent, jobs for low-skilled workers, and service coverage in areas devoid of formal transit supply, carry major costs, such as increased traffic congestion, air and noise pollution, traffic accidents, and even violence among route cartels (Cervero, 2007). In addition to regulating paratransit systems through measures in between the extremes of acceptance and outright prohibition, several options are available to medium-size developing cities that wish to improve the quality of formal bus services.

A more effective intervention in favor of public transport is the construction of busways that are physically segregated from other traffic by means of barriers, cones, or other well defined physical features. Located on the curb or in the median of a roadway, they are permanently and exclusively for the use of public transport vehicles-although emergency vehicles are often allowed to use the lane (Wright, 2007).

Bus Rapid Transit (BRT) is a recently developed bus-based mass transit which emulates the performance and amenities of rail transit. If fully implemented, it is often more appropriate for large cities as it can transport up to 45,000 passengers per hour per direction, surpassing the capacity of many rail systems. To date, full BRT has been developed only in a few large cities (including Bogotá, Curitiba, and Guangzhou) with very high levels of political commitment and charismatic political leadership in support of quality public transport (Wright, 2007).

More standard forms of BRT include segregated busways over the majority of the length of the system's trunk/city center corridors and at least two of the full BRT characteristics. These serve up to around 13,000 passengers per hour per direction, and may be more suitable for cities in developing countries (Wright, 2007).

In 2014, the Ministry of Transport and Infrastructure in Nairobi Kenya, together with their consultants from Germany, Gauff Consultants, completed the MRTS (Mass Rapid Transit System) Harmonisation Study of Nairobi. The aim of the study was "to bring together all previous studies and plans and to develop an integrated public transportation network for Nairobi and the Nairobi Metropolitan Region (NMR). The MRTS Harmonisation Study recommended five MRTS lines with a focus on BRT (ITDP, 2015).

In May 2015, INGEROP, a French engineering firm, as leader of a consortium, was awarded by the European Union on behalf of the Government of Kenya, the feasibility study and detailed design of the Bus Rapid Transit system in terms of technical, economic, environmental, social, legal, institutional and operational issues on two corridors:

Line 3 Chui West: a 10 km long key west-east arterial road located in the western part of Nairobi.

Line 4 Kifaru East: a 7 km long road, serving the Central Business District and East Nairobi.

INGEROP, has already been involved in Kenya in water and waste projects in Nairobi, and is now embarking on the major transportation project, which will highly contribute to the development of the city's public transportation by 2030. (INGEROP, 2015).

This step has been widely received by residents as a potential solution to Nairobi's transport challenges but until its completion, the residents remain captive to the endemic congestion and unsustainable transportation situation prevailing currently.

CONCLUSION

When considering investments in public transportation within cities in developing countries, a key priority should be to improve existing transport systems. BRT is more affordable and cost-effective in these cities than many other types of public transportation systems, including LRT. The high capital and operation cost of metros makes them less economically viable in medium-sized developing cities than in megacities. Promoting more sustainable patterns of urban development is also crucial for reducing the environmental impacts of cities but the appropriateness of different forms of development is context-dependent. Uncontrolled low-density sprawl is, however, rarely appropriate. Technological improvements can help to address urban environmental problems but they cannot address all transport-related problems. Moreover, the benefits of technological advances may be offset by rapid transport growth in developing cities. However, inexpensive technologies such as new mobility services via cell phones (i.e., on-

demand transport e.g. Uber[8], or Digital Matatus[9], a paratransit route map) already exist in developing countries and could be utilized more extensively to promote new innovative forms of urban transport services.

There is increasing recognition that combinations (or packages) of measures are necessary (Gilbert, 2012). Certain combinations of policies can work together and give rise to synergies, leading to impacts greater than the sum of their individual parts. The identification of policy packages is a crucial issue for promoting more sustainable urban transport: packages should maximize potential synergies. It is crucial to consider local factors such as costs, feasibility, and barriers. Finally, caution is advised both in terms of the appropriateness and effectiveness of policy solutions being transferred to cities in developing countries from larger cities and/or from more developed countries.

8 An American international mobile ride request company which allows consumers with smartphones to submit a trip request which is then routed to nearby Uber drivers who use their own cars as taxis a form of public transport.

9 The map is being used to guide the UNEP sponsored BRT project: http://www.digitalmatatus.com/about.html

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Endnotes

1 In May 2016, the Kenyan Transport Cabinet Secretary, James Macharia, said that the implementation of the proposed bus transport system has proved difficult due to lack of provisions in the existing road infrastructure to cater for special lanes to be used by the new buses. http://www.theeastafrican.co.ke/business/Kenya-retreats-on-rapid-bus-transit-plan/-/2560/3221604/-/10gm01i/-/index.html

An assessment of Lagos state government intervention in informal settlements management vis a vis international standards - case study of Makoko community, South-West Nigeria

Oriyomi AKINYEMI, Nigeria

The high demand for housing has forced many of the urban poor to look for an affordable alternative in the periphery of the urban area where there is little or no presence of government, urban planning and land management to build shanties and thereby create slums. This paper assesses Lagos state government intervention in Makoko community as an informal settlement Vis a Vis international standards. The methodology of study is expository and adopts content analysis and evaluation approaches in the collection and analysis of reliable evidence on the upgrade of Makoko community. The study evaluates policies of the Lagos state government of Nigeria on the management of informal settlements in a global context in order to identify the issues and challenges in the socio-economic transformation of Lagos using Makoko as a case. The study reveals that the partnership of Lagos state government with the World Bank was not successful as a result of failure on the part of the state government.

INTRODUCTION

Africa is currently in the midst of a number of simultaneously unfolding and highly significant transitions, among them demographic, economic, technological, environmental, urban and socio-political (UN-HABITAT The State of African Cities, 2014). The high demand for housing has superseded the supply by the governments in the recent years. This has forced the urban poor to look for an affordable alternative elsewhere in the urban area mostly the periphery where there is little or no presence of government, urban planning and land management to build shanties and thereby create slums. The increase in population and need to meet ends has also added to the expansion of informal settlement especially in the global south. These set of deprived people are excluded in the governance of the city and lack the right to basic social amenities.

Some informal settlements evolved as a result of slums creation which have been in existence for many years or even decades. They are community of people who live together and independently gathered what they have with the available resources. They are deprived and excluded form of informal settlement characterized by poverty and large agglomeration of dilapidated housing often located in the most hazardous urban land (UN Habitat, 2015)

The UN-HABITAT (2016) observed that the failure of urban planning and the construction sector in matching demand for homes has resulted in a huge housing backlog that has led to the development of informal settlements in a variety of contexts globally. Due to constraints in formal housing and land delivery systems, more and more people who would otherwise qualify for housing programs are resorting to slum settlements. Consequently, addressing the issue of an informal settlement would play a major role on their standard of living and involvement in governance.

Indeed, the dynamic of informality in affected countries is related to factors such as lack of policy tools that provide housing to the low income people and the poor distribution of wealth Sanchayeeta Adhikari and Kushal Deb (2004). The UN Habitat over the past three decades has made concerted efforts developing policies and working with governments of different countries with the objective of mitigating

the challenges of informal settlements. However, government of many countries in the global south lacks the capacity and political will to implement the UN Habitat policies, hence, the challenges of informal remain intractable.

This study presents an evaluation of the policies of the Lagos state government of Nigeria on the management of informal settlements in a global context with the objective of identifying the issues and challenges in the socio-economic transformation of Lagos using Makoko as case study. The choice of Makoko is based on its prominence and global attention among informal settlements in Lagos. Being an expository research, the study adopts content analysis and evaluation approaches in the collection and analysis of reliable evidence on the upgrade of Makoko community by Lagos state government through the Lagos Metropolitan Development and Governance Project (LMDGP) and international best practices.

The paper is divided into six sections. The first is introductory, while the second section of the paper reviews recent literature on the subject matter. The third reviews the global policy directions towards management of informal settlements through a description of innovative approaches documented by the UN-Habitat. The fourth section, describes the study area with emphasis on what has been achieved through the LMDGP while the fifth evaluates the performance of the LMDGP in a global context to identify the shortcomings. Conclusion and recommendation on the way forward constitutes the sixth section.

LITERATURE REVIEW

The growth of informal settlements in the global south has been a major concern to the international community for decades and studies in this regard have yielded critical insights on how the issues and challenges could be managed particularly in the area of policies and strategies. The Cities Alliance has emphasized on the need to recognize the place of informal settlements and slums in developing societies and to undertake its improvement through partnership (Mallo Daniel. et. al., 2015). It posits that an all-inclusive involvement of slums dwellers and stakeholders in slum upgrade policy will avail information at the onset as to the best ways to achieve the improvement.

Informal settlements, slums and other poor residential neighbourhoods are a global urban phenomenon. They exist in urban contexts all over the world, in various forms and typologies, dimensions, locations and by a range of names (squatter settlements, favelas, poblaciones, shacks, barrios bajos, bidonvilles). While urban informality is more present in cities of the global south, housing informality and substandard living conditions can also be found in developed countries. In Africa, over half of the urban population (61.7%) lives in slums and by 2050, Africa's urban dwellers are projected to have increased from 400 million to 1.2 billion (UN-HABITAT III 2016).

Different authors have described the nature, existence, causes, upgrade or improvement on slum communities, the difference between a slum and an informal settlement. Slums are generally perceived as negative to the city. Cities Alliance refers to slums as those abandoned part of cities with horrifying housing and living conditions. Similarly, SIDA (2006) describes slums as deteriorating urban settlements, with unhealthy environmental conditions and highly congested with poor housing conditions.

Slum dwellers are seen as highly unskilled people with no formal education who cannot productively participate in the opportunities in cities hence their contribution to the city's economy and development unimportant (UN-Habitat, 1987). On the contrary, slums are also perceived as positive to the city, being a solution to the city housing shortage, provider of the labour force in the city among others. Slum dwellers are united and live as one family when necessary. Nawagamuwa & Viking, (2003), observed that just like any other communities in the urban areas, slums have leaders and community representatives who represent their collective interest.

Over the past 10 years, the proportion of the developing countries' urban population living in slums has declined from 39% (2000) to 32% (2010). In fact, UN Millennium Development Goal (UN-MDG) reports estimate that between 2000 and 2010, a total 227 million urban slum dwellers in developing countries experienced significant improvements in their living conditions, thus implying that Target 11 of Millennium Development Goal 7 has been exceeded by double (UN-HABITAT, 2016).

UN-HABITAT has rendered a wide range of assistance to many countries in developing strategies to upgrade their informal settlements. It also helps in strengthening institutional building as well as skills development of technical cadre from governments and other stakeholders involved in developing informal settlements. In this process, a number of participatory planning tools have been

developed.

Cities Alliance noted that countries around the world have devised strategies for the upgrading of slums and one of such strategies involves the use of a bottom-up approach as opposed to top-down; it also involves the empowering of local government authorities and agencies to implemented slum upgrading programs. Some countries that have achieved success on the basis of employing this strategy include among others, Indonesia, Brazil, Jordan, India, Tunisia and the Philippines (World Bank and UN-Habitat, 1999 p. 3).

Some studies in other parts of the world show the different approaches towards improving informal settlements. The housing condition study of the urban poor in Freetown by The Government of Sierra Leone funded by UN-HABITAT, The United Nations Development Programme recommended strategic, social, economic and physical improvement on the slum and informal settlements in Freetown.

Also, the UN-Habitat (2007) report on situation analysis of informal settlements in Kampala suggested ways forward on the improvements of slums. It proposes adequate flow of information among the stakeholders, early community participation in the project and sensitizing the slum dwellers on preparation for change prior to mobilization. However, it was advised to avoid slum upgrade close to election period to avoid political interference in the project, and the community are skeptical about the implementation of the programme due to prevalence corruption in Uganda and need for in-built mechanism to control effect of corruption

The success and failure of countries in managing informal settlement is determined by several factors. However, the innovative approaches deployed in the management of informal settlements with success stories as documented by the UN Habitat is presented in the next section of the paper.

UN-HABITAT INNOVATIVE APPROACHES IN MANAGEMENT OF INFORMAL SETTLEMENTS

The UN Habitat report on human settlements (2009) noted that, the usual approach to informal settlements has mostly been removal or neglect in order to achieve spatial planning and regulation. However, the desire to approach informality with the conventional measures to planning, land administration and regulation is uncertain in many countries. According to the report, four feasible and innovative approaches have been identified:

i. Alternative to eviction

ii. Regularization

iii. Strategic use of planning tools to influence development actors and

iv. Partnerships between public agencies and informal businesses to manage public space and provide services.

I. Alternative to eviction

A better alternative to the eviction of informal settlements is been suggested under this approach. Eviction according to the UN Habitat report on human settlements has sometimes been used to achieve hidden intentions of politicians to settle scores or 'ethnic cleansing. Forced evictions disproportionately affect certain groups such as women, travelers, migrants and indigenous people (Biderman et al, 2008). Scholz (2002) said in his paper that eviction is associated with violence such as beating, intimidation, rape and coercion which is especially towards women.

This approach discusses the rights of people to decent work and security of tenure which includes housing, privacy and possessions. ADB (1998); World Bank (2004); UN-Habitat (2007a) observe that eviction is a violation of human rights according to international law and urges government to consider all feasible alternatives and adhere to good practice guidelines if eviction is compulsory. Often the most feasible and appropriate action open to governments is to stop the most harmful ways in which they intervene, such as forced evictions (Amis, 2004). Publicly calling a halt to harassment and eviction of informal occupants of land in public ownership immediately increases their security of tenure, encouraging them to invest in their houses and enterprises, and improving the prospects for dialogue about the future of the areas concerned (Kundu, 2002).

II. Regularization

Regularization is another acceptable alternative to removal or eviction in informal management. The UN-Habitat report on human settlements defines regularization as recognition and provision of secure tenure, while upgrading generally focuses on the provision or improvement of basic services, although it may also involve re-planning and redevelopment to ensure compliance with planning and building regulations. It is the process of formalizing the

informal tenure system. Formalization of tenure is the provision of title to individual plots which is the strongest legal form tenure rights can take. The title will not only help in planning but gives the landowners rights and sense of belonging. This will enable the land owners to borrow using their properties as collateral.

III. Strategic use of planning tools to influence development actors

The developing countries in the 1970s in an attempt to nationalize land and meet the urban land through administrative allocation ensure that developments are in accordance with a master plan. There are limitations to this model during the demonstration of this model and today, approaches are focused on the strategic use of public planning and financial resources to guide development. It includes construction of trunk infrastructure to influence development pattern, guided land development, land readjustment and a stepwise extension of detailed planning in defined areas.

IV. Working with informal economic actors to manage public space and provide services

The informal entrepreneurs are the informal economy actors who operate in the retail trade and related services, water, transport, manufacturing and other related services. This approach explains the acknowledgement of the important roles they play in urban economy, the household livelihood and the right to operate in the city by the informal entrepreneur. Also understanding their economic operation, contributions towards providing goods and services and constrains under which they operate. This therefore enables government in coming up with policies and programmes that counter adverse effects and address constraints without jeopardizing enterprises. This approach identifies six techniques:

- Recognition of informal entrepreneurs' property rights
- Allocation of special purpose areas
- Managing shared public spaces
- Provision of basic services and support
- Mixed-use zoning
- Organization of informal operators

A close examination of these innovative approaches to managing informality by the UN-Habitat reveals that managing informality in human settlements is not solely a government responsibility and should be done in collaboration with other stakeholders particularly the people that will be affected by government intervention. However, such improvements are to be initiated by the government and the execution of any programme arising from the intervention should follow due process to avoid policy failure.

All the four approaches are good and implementable however, they have their shortcomings. The first approach is a complex one that requires Non-Governmental Organization in a well-organized community. The regularization approach is as well complex and costly to fit infrastructure and facilities if sites have not been provided for this purpose. Without proper planning of new development and complementary policies, influencing development actors may benefit only large scale investors. Extending effective planning and building control to home-based enterprises and mixed-use areas in low-income countries is unlikely to be feasible for some considerable time. The fourth approach appears to be most preferred of all which explains its adoption by the LMDGP for the Makoko intervention.

THE STUDY AREA

Lagos with a land area of 3,345 sqkm and population of about 20 million people is one of the world fastest growing mega city. It is the most populous state in Nigeria with just 0.4% of the country's land area and this makes it the smallest of all the states. Lagos is the commercial capital and the financial engine of the country. The commercial nature of Lagos has continued to grow the economy of the state stronger thereby attracting migrants into the city, causing rapid rate of urbanization with a daily inflow of about 1643 people in the city.

The increase in population of Lagos with the shortage of land has made housing highly competitive and not affordable for the low income earners. This housing shortage has forced the urban poor to seek for an alternative in an informal and deprived settlement creating new and expanding the already existing slums in Lagos. Housing prices in Lagos were high due to the non-availability of long-term finance, high transaction costs for obtaining land titles and/or certificates of occupancy, regulatory and planning controls for building and construction that constrained the efficient utilization of land, as well as high inflation rates in the Nigerian economy (World Bank, 2014). Informal settlements and slums in Lagos have been therefore, a consequence of both market and government failures.

There are over 200 slums in Lagos according to United Nation and two third of the city's land area is categorized as slum communities. Around 70 percent of Lagos residents live in poor, often illegal, settlements, such as the renowned slum of Makoko, in or near low-lying areas (USAID, 2013). Makoko is a water front community on the Lagos Lagoon since 1860s and is globally synonymous to a fishing settlement. The community consists of settlement on both land and water with multicultural population. The land population of Makoko is estimated at 85,000 by the World Bank.

The culture, identity, occupation, and general lifestyle of most of the inhabitants are linked to access and use of open water for fishing and transportation of wood from the hinterland to Lagos. The people of Makoko community have harmoniously and peacefully existed despite their ethnic and religious differences. It is a large low-income community with a vibrant local economy in smoked fish production.

Before 2010, people of Makoko only rely on self-installed boreholes for their water supply. LMDGP in the year 2010 constructed a borehole but became dysfunctional immediately after inauguration and now recently constructed. In some cases, pipes spanning more than 500 meters were used under the lagoon in transportation of community confirmed potable water from locations beside the University of Lagos to the people on land. There are 15 borehole points on land and available to the communities on commercial basis.

Similarly, there is no presence of any health center within the community except a Non-Governmental Organization AIDS Testing center. The residents of Makoko rely on the neighbouring communities of Ebute Meta and Iwaya for health service. Prior to the recent collaboration with the Lagos waste management authority, the community's solid wastes are collected at a particular point to form land on the lagoon for their expansion while some residents patronize the private sector for their disposal. There is no any organized market structure in place within the community as the Temidire Fish Market which has now been converted to different uses like private residential, commercial and religious. There is a newly upgraded Asejere market in Makoko.

The entire community of Makoko has no secondary school. The community has a total of 15 privately owned nursery and primary schools, however, there three public primary schools which are located along the road that leads into the community. According to Makoko/Iwaya Community Regeneration Plan report a typical class of nursery school in Makoko has an average number of 18 pupils while the primary is 30 pupils. Like in the case of health service, the students of Makoko community rely on the neighbouring of Iwaya, Ebute Meta etc. for their secondary education as there is neither public nor private secondary school in the area.

Besides, the community rely majorly on the nation's national grid through Power Holdings Company of Nigeria for their electricity supply. Apollo Street where the feeder terminates, is network of wires which distribute to different houses on both land and lagoon. It is an irony to state that electricity generator popularly known as "I better pass my neighbour which is to serve as an alternative to the power supply from the national grid has assumed the role of the main power supply. The inventory of social infrastructure in Makoko is presented in Table 1.

LAGOS METROPOLITAN DEVELOPMENT AND GOVERNANCE PROJECT IN MAKOKO

In year 2006, the World Bank in collaboration with Lagos state government embarked on a project called Lagos Metropolitan Development and Governance Project (LMDGP), aimed to give Lagos a facelift by investing in the improvement of basic infrastructures. The project is focused on improving the standard of living of the citizen most especially those who reside in the slum areas within the metropolitan areas of the state by improving their housing condition. There are 9 major slums identified for this project which include Ilaje, Ajegunle, Iwaya, Badia, Bariga, Amukoko, Itire, Agege and Makoko. In the end, the project is expected to directly benefit an estimate of one million people (LMDGP Report, 2005).

LMDGP is said to involve the displacement and relocation of some slum dwellers currently living on any property that will be needed for proposed public infrastructure such as roads and drainage (LMDGP Report, 2005). The Lagos State Government as a collaborator was required to submit a Resettlement Policy Framework that will be in line with the World Bank Resettlement Policy.

The Resettlement Policy Framework would serve as a guideline for all stakeholders involved in the project to ensure transparency, accountability and due process at all time. The essence of the Resettlement Policy Framework is to ensure that the project affected persons (PAPs) are protected

S/N	AMENITY	EXISTING
1	*School-Nursery* Government funded Private-funded	 15 (Nursery/Primary)
2	*School –Primary* Government Funded Private Funded	 3 15(Nursery/Primary)
3	*School- Secondary* Government Funded Private Funded	 1 (proposed)
4	Life Skill Acquisition Center	
5	Health Center	0
6	Market	1
7	Source of water	Borehole
8	*Water Supply Point* On the Land On the Lagoon	 15 7

Table 1: Inventory of Social Infrastructure in Makoko. Source: Authors field investigation. 2016

Fig. 1. Map of Makoko. Source: Google image, 2016; Makoko / Iwaya Waterfront Regeneration Plan page 26

from any negative social, financial and physical loss that can be associated with the resettlement and those PAPs are able to improve or at least sustain their previous living conditions, before resettlement took place. It was also agreed that the World Bank policy will be adhered to where there is disparity between the Nigerian law and World Bank policy. The budget of the project is summarized into 4 areas of general upgrade of slums, drainage provision, solid waste management and capacity building in the 9 identified slums. The following are the LMDGP works in Makoko:

- Rehabilitation of Sarriyu street and Acts of Apostle street that leads to their major market -Asejere Market
- Upgrade of better life market to Asejere market
- Rehabilitation of Erejuwa street still ongoing
- Rehabilitation of Makoko round-about
- Rehabilitation of the 3 public primary schools
- Construction of 4km Dacosta-Makoko collector drain.
- Construction of 3km Oyadiran collector drain, in Makoko.

Bank's compensation policy for individual or group affected by project upgrade

The estimated number of the affected people is unknown, however, they are categorized into 3 groups by LMDGP for compensation consideration. These are:

a. Individuals affected by the upgrade: There will be compensations for individuals affected by the project that suffer the loss of land, property, loss of asset and investment, access to natural or economic resources.

b. Household affected by the upgrade: There will be compensation for any household or member of a household located in Makoko or any of the other 8 slums, affected by project activities. Either through the loss of property, restriction to sources of livelihood, or other negative effects created by the upgrade. Those provided for include:

(i) Any member of the household, house tenant, dependant, or friend, regardless of gender, religious affiliation, age, etc.

(ii) Old or handicap members of the household.

(iii) Household members that cannot reside together cultural or religious rules but depend on each other for support and daily existence.

(iv) Members of family that help with housekeeping, maintenance or productive services but may not eat together.

(v) Vulnerable Households: Vulnerable people that find it difficult or cannot participate in production, consumption or co-residence because of physical or cultural reasons. (This also involves members of the production team that may exchange domestic or farming services regularly but may live separately).

c. Vulnerable Households: Vulnerable households include owners of compound walls, shops or rooms that are partly affected by demolition from upgrade activities, if partial demolition will deprive neighbouring landlords from gaining income from rent or lean to the termination of rent by their tenants (LMDP Report, 2005).

The LMDGP collaboration with the World Bank involves relocation of the dwellers (Project Affected Persons) who are located along the development path of the project. These people are to be relocated in accordance with policy of the World Bank resettlement. Below is the World Bank resettlement policy

- Involuntary displacement should be avoided whenever possible and alternative urban projects should be considered to avoid disruptive and impoverished effects. In the case where displacement cannot be avoided, resettlement should be carried out with regard to displaced person's needs, entitlement and protection from the environment.

- Involuntary resettlement should be carried out as a 'developmental program'; where adequate opportunities is given to affected people in order assist them improve or at least restore their previous living and earning capacity. This includes compensation at replacement cost, opportunities to share in the benefits of the project and help with the movement and support while in transition at the relocation site.

- If agreed upon by the affected people, displaced groups should be moved collectively to preserve the social ties and network.

- There should be sufficient public revenue for compensating affected persons in order to ensure adequate resettlement and rehabilitation and compensate them for the loss incurred by involuntary displacement from their current housing.

- The distance between the current site and the relocation site should be minimal, in order to balance the spatial and cultural differences and economic opportunities. To enable the affected people can adapt and integrate into their new environment without difficulty.

- Both the displaced community and the host community's social and cultural institutions should be considered in the resettlement process. The affected people should be consulted and informed about their entitlement, options and moving timetable. There should be active and organized participation with the community in decision making and implementation of resettlement.

- New resettlement communities should be provided with required infrastructure and services.

- Host community to receive additional affected people must be considered in the planning process and should be given necessary assistance in tackling the social and environmental effects of population increase.

- Finally, affected people that have informal customary land with or without legal title or other resource that might be lost due to involuntary resettlement, must be provided with suitable land, infrastructure and adequate compensation for resources lost.

Given the World Bank involvement in the LMDGP it is expected that the strategies deployed are consistent with global policy and international best practices on rehabilitation of informal settlements.

Evaluation of LMDGP in Makoko

The report on the success of Lagos Metropolitan Development Governance and Project is unsatisfactory to the sponsor LMDGP (2014). The shortcomings of the project could be traced to a number factors, ranging from the project design to monitoring and evaluation of the project. The factors according to the World Bank are stated below:

Project design - The World Bank report states that the project was largely ambitious and complex. The integration of the three tiers of government including the private stakeholders caused constraints in sharing information. The commitment of government towards the project was weakened and interest declined by the end of the project. The stakeholders meeting at this stage of the project were no longer being attended by senior officials who can make decision.

Implementation - the reported stated that multiple supervision by the state government and World Bank officials affected the implementation of the project. Also, the change of government around 2008 affected the relationship between the bank and government officials. Although, there was significance success recorded in the solid waste management but the

LMDGP fund lost primacy. According to the report, Lagos was already sourcing for funds.

Monitoring and evaluation - The progress report on the project, expenditure and achievements was generally poor. The difficulty in keeping record of execution and achievement of targets was as a result of disconnection between different reports.

Based on the reliable secondary information on the state of LMDGP in Makoko and the international best practices in the improvement of informal settlements, the Lagos state government is far from accomplishing its goal due to a number of factors. For instance, while international standard requires full community engagement in state intervention, it is very clear that this is not the case in Makoko. The residents are not fully engaged and as such could not fully contribute their quota to the success of the project.

Besides, the state of governance in Makoko Community is a typical reflection of the top-down system of government that disconnect the institution from the citizen. The failure of the LMDGP is a signal that the bottom-up approach is highly needed to replace the top-down approach for a result-oriented community engagement. Official aid agencies and development banks in most cases do not implement initiatives on the ground, instead funding others to do so and they are only as effective as the local institutions they fund. If the funded central or local governments have no relationships with, or accountability to, the local citizens, these international organizations no matter how honest their intentions reinforce undemocratic structures (Fabienne H. & Ebun A., 2015). They further observed that, the citizens of low-income communities are often acutely aware of what is required to improve their living conditions, generally needing relatively little funding.

CONCLUSION

The partnership of the Lagos state government with the World Bank for the socio-economic transformation of Makoko through LMDGP since 2006 is a welcome development. Evidence from literature shows that the community is unique in several ways and needs a careful intervention that would not jeopardize the livelihoods of residents. A close examination of the situation in Makoko and the review of the World Bank on LMDGP reveal that the intervention is not a success story.

As earlier stated, the World Bank LMDGP in Makoko Lagos is focused on improving the standard of living of the slum dwellers by investing in the basic infrastructures such as road, drainage, improving housing condition, access to portable water among others. The project however failed due to inadequate flow of information, change of government, lack of commitments by the state government. Interestingly, the Bank report scored the project low in terms of project design, implementation and monitoring and evaluation. What is obvious in this study is that the Lagos state government has not taken the advantage of the expertise of World Bank personnel on the project. While the World Bank remains committed to its role in the project, it is expected that the Lagos state government should live up to expectation.

To move forward the following steps should be taken:

- Streamline the project framework for clarity and make it simple to facilitate seamless flow of information among the stakeholders. The commitment of government needs to renew its commitment for the success of the project.

- Project implementation should have a structure that eliminates multiple supervision by the state government and World Bank officials. The significance success recorded in the solid waste management should be carried on into other sector and judicious use of available funds should be ensured for goal achievement.

- There is need for proper monitoring and evaluation. Keeping of record of project execution and achievement of targets should be enhanced. There should be proper integration of all reports relating to the project.

- The Lagos state government should have an up to date report of project evaluation and compare notes with the World Bank such that project monitoring and evaluation can be harmonized.

- Finally, the Lagos state government in collaboration with the World Bank need to review the community engagement, project approach, the process and resettlement options for the project to be a success.

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Civil activism as a means of promoting participatory planning: the case of Tula

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The paper summarizes the author's one-year experience of civil activism while simultaneously being an urban planner. The theoretical framework of the paper is shaped by the concepts of radical planning, advocatory planning, guerrilla governance and soft power. Civil activism is considered an effective way of promoting social change in authoritarian regimes, as it is a very complex channel for exercising soft power over governments and dominant groups. The development of civil activist movement in the city of Tula and its penetration into political processes is described in detail. The results of this growth so far are presented and discussed. In conclusion, several practical recommendations for activist planners are provided.

1. INTRODUCTION

The issue of involving citizens in various planning processes is gaining popularity all over the world. There is evidence that citizens' inclusion is beneficial for planning outcomes (Legacy & van den Nouwelant, 2015) and that city planning without use of participatory planning is less effective (Gedikli 2009). Advocates of coproduction argue that involvement of different stakeholders is essential for more effective management and for societal transformations (Albrechts, 2012; Ostrom,1996). Nonetheless, in practice there are several concerns about participatory planning. Some researchers find modern inclusion selective: despite seemingly better access to various facilities and institutions, wide spectrum of civil rights declared and broader opportunities for participation, many people cannot enjoy them for various reasons (Miraftab, 2009). Together with this, involvement sometimes serves only for legitimizing of some dominant position (Ibid.).

Moreover, issues related to participatory planning process differ in different contexts, whether political, social or economic (Sandercock, 1998). In authoritarian regimes there are several factors that hinder participatory planning: strong power hierarchy, weak communities, passive citizens, limited powers of local governments, etc. In many cases there is no understanding of the necessity of such approaches and their advantages, and they are mainly perceived to increase costs. This situation is aggravated by the logic of governments of various levels and business, which mainly think in short-term, whereas participatory planning is more beneficial in mid to long term.

Nevertheless, there is evidence that participatory planning is still possible in authoritarian regimes (Beard, 2003). In Russia there are only rare cases when participatory planning is used. There are not many organizations in Russia that use this method, and the author knows only one such an organization called "Project Group 8". In modern Russian Federation participatory planning is more of an optional tool than an essential mechanism of planning: local governments rarely use it, and architectural firms only apply it if they want. During an interview, one of the leaders of "Project Group 8" indicated that there is demand for participatory planning among municipal authorities, charitable funds, private organizations and activists in some regions of Russia.

In this article issues related to promoting public involvement in planning processes in authoritarian regimes, namely in Russia, will be discussed. It is based mostly on my one-year experience of civil activism and half-year participation in expert meetings aimed at the elaboration of Tula strategic plan-2021. In the article I argue that being an activist turns out to be useful for planners in two ways. First, it broadens their understanding of some issues related to a city and various groups; second, activism may be a means of promoting improvements in the process of planning, e.g. the application of participatory planning. This promotion process resembles that of exercising soft power by one state over another one. I also build on Davidoff's (1965) point that a planner should be an advocate of

the interests of some groups by stating that being an activist is a premise for professional becoming of an advocate (or any other type of) planner.

I will start with drawing a theoretical framework for planning, participation, activism and soft power. In this section, issues like the purpose of planning and various forms of participatory planning, the functions of a planner, etc. will be considered. Then I will briefly introduce the context in which civil activism unfolds in the city of Tula and proceed with my activism narrative followed by the narrative of my participation in expert meetings and promoting participatory planning there.

2. THEORETICAL FRAMEWORK

2.1. Conceptualization of participatory planning

In order to eliminate confusion, I find it appropriate to start with the definition of planning. Here planning is defined as «deliberate transfer of knowledge to action in the public domain for the purposes of moving towards a shared vision of the 'good society'» (Beard, 2003).

There are various forms of planning stipulating involvement of citizens: participatory (Fenster, 2004), radical (Beard, 2003), insurgent (Miraftab, 2009), collaborative (Healey, 1997), advocacy (Davidoff, 1965), communicative (Sager, 2009) and other types of planning. Also, there are some closely related concepts like 'guerilla governance' (Legacy, van den Nouwelant, 2015). Many of these concepts are quite close or seem to intersect. Therefore in this paper only those crucial for understanding the key idea will be discussed. In order to avoid confusion, the term "participatory planning" is treated extensively in this paper as a form of planning which implies citizens' participation/involvement. If any special form of participatory planning is examined, it is specified.

Although advocatory planning is not a form of participatory planning, it is important for understanding the role of a planner in the planning process. Advocatory planning is a process in which a planner represents interests of a particular group and prepares development plans according to their needs (Davidoff, 1965). It stipulates that various planners have to advocate their plans at some hearings as if they were trying to defend their position in a court. Such a competitive processes lead to better planning because different alternatives are discussed from various perspectives. Together with this, an advocate planner also has an educational function, as he or she informs citizens about their rights, provides them with information related to the planning process, etc. I argue that in autocracies the role, functions and competences of an advocatory planner should go beyond mere planning and advocating particular interests, especially when one sticks to the ideal of better society.

Another related concept is that of radical planning. Its distinctive feature is that it stipulates disagreement with current the order (Beard, 2003; Friedmann, 1987). I believe that such disagreement is likely to occur in authoritarian regimes because they foster inequality and impose oppression. Because of control, punishment or hostility of those who have different opinion, often it is impossible for some ideas to be considered. Radical planning seeks to change this situation of inequality. Importantly, a radical planner must participate in the activity of a group he or she helps, but must nonetheless «walk the thin line between standing apart from the group's practice and being consumed by it» (Beard, 2003:17).

According to Beard (Ibid.), there are several stages of unfolding of radical planning. At the beginning, it is subtler, i.e. no dissatisfaction with current situation is manifested. Then, with the course of successful actions, community members gain competences and necessary skills for better organization along with political consciousness. In some cases, opposition views may get articulated, provided that the circumstances are favourable. Among others, periods of power transition, although not always, can be considered in such circumstances. At least such periods can be the opportunity to reinforce one's position.

Importantly, although radical planning implies opposition to the existing situation, in a restrictive political context, during the early stages one should find ways for their actions to get approved by the government (Beard, 2003), so that their practice did not get illegal. One of effective ways of achieving that is doing something which is compatible with existing governmental programmes (Ibid.). If this condition is respected, a community may even get different types of support from the government. For that reason, it is always important in radical planning to be familiar with governmental programmes, grants, etc.

The third important concept in this framework is that of guerrilla governance, which can be described as a set of actions performed by a community in a situation when its members feel or are excluded from some processes led by a government, in which they think they have right to participate (Legacy, van

den Nouwelant, 2015). Guerrilla governance can be either subtler or more direct. The first variant is likely to appear in oppressive environments where direct expression of disagreement is likely to be ignored or have negative consequences. This variant stipulates application of means similar to those of soft power in political science and international relations.

2.2. Soft power in the context of governance and planning

Joseph Nye defines it as "the ability to affect others to obtain the outcomes one wants through attraction rather than coercion or payment" (Nye, 2008: 94). In other words, exercising soft power is mainly about transmitting one's values in order to attract someone. In this article, the idea of soft power gets reversed: usually soft power is used by a government to influence another country's citizens, but here I discuss the situation when the public tries to similarly influence their own government. Although the roles appear to be changed, the approach remains similar.

Mechanisms of influencing governments are elections, referenda, civil manifestations, etc. In Russia many such instruments are proclaimed by the Constitution, but in fact their application is limited. Therefore, one sometimes has to search for alternative ways to get their opinion taken into account, and in some circumstances informal or indirect channels can be more effective than traditional ones. Among others, they can include: personal communication with officials who make important decisions, publicly announcing some new ideas, participating in expert meetings and consultative institutions established by high-level officials.

In order to maximize the effect, all the three dimensions of soft power should be considered: daily communication, strategic communication, lasting relationships (imply educational programmes, conferences, etc.) (Ibid). Together with this, one of the essential elements in exercising soft power is credibility (Ibid.), without which any soft power cannot be exercised.

2.3. Civil activism as a source of soft power

Civil activism can be considered an effective channel of exercising soft power, as it allows the combination of various means of influence and helps spread ideas, values, competence, etc. It also helps to use all the dimensions of soft power and, if an activist community's strategy is wise, provides resources for building credibility of officials. In addition to that, a planner as an activist has numerous opportunities for professional growth, because being an activist implies facilitation, communication, involvement and other practical skills useful for a planner.

In Russia civil activism has some distinctive features. First of all, Russians appear to be very passive in this respect, as only 16% of citizens participate in any civic practices, which is lower than in most countries of Europe (Sedova, 2015: 295; data from 2012). On the other hand, in Russia civil activism is represented mostly by "socially advanced, successful, mobile groups" (Ibid.: 284), which indicates that they have quite high potential as drivers for social change. Research indicates that non-political and political aspects of civic activism are closely related with each other, and most citizens engaged in non-political activities also take part in political ones (Ibid.). It means that these two aspects of civic activism are hardly separable, and by participating in civil activities we can and actually are participating and influencing political processes.

3. TULA CASE-STUDY

3.1. Tula as a context for civil activism and planning

Tula is an old industrial city of approximately 500 000 inhabitants 180 km away from Moscow. As in Russia in general, the population in Tula is also quite passive, which got obvious during my experience of civil activism there. Close distance from Moscow influences Tula strongly. On one hand, it is easy to get there by car, or by bus, which takes about 2-3 hours to get to the outskirts of the city and 3-4 hours to get to the centre, or by train (2-3 hours to get to the centre). This provides Tula citizens with great opportunities for leisure they cannot get in their hometown. According to the on-line survey I held in spring of 2015, Tula citizens mention lack of alternatives regarding their leisure (45% versus 8% who say there is a diversity of options), despite the fact that 67% answer that during the past 1-2 years more opportunities for leisure appeared in Tula. It may indicate that the new opportunities that are created are quite similar and unattractive.

On the other hand, mean wage in Moscow is higher than in Tula and the number of job opportunities for high-qualified workers there is also higher. If one takes into account the fact that real estate rent prices are higher too, the fact that many people from Tula work in Moscow demonstrates that working there is considered a better opportunity, although work-life balance may get flawed. Moreover, most of Russia's top universities are situated in Moscow,

which attracts young prospective students from all regions of Russia. As there are more high-qualified and creative jobs in the capital, many students stay there after their education.

In other words, the megapolis is close enough to get there to spend an evening for entertainment and come back home but too far not to move there from Tula if one wants to work or study there, which finally causes decrease in population and leak of creative people which could be in the core of civil practices.

In Tula there are two large educational institutions: Tula State University, Tula State Pedagogical University, – and several small ones. Here one can study urban planning only in Tula State University: students learn it within a special semester course at the department of architecture. It is evident that urban planning cannot be taught well within a single course. There are some architectural bureaus in Tula, and their management complain about the quality of professional training in the city. For example, one of the top-managers at Tula bureau "Arkhproyekt" told me that they tried not to hire students from Tula as they lacked necessary skills.

Tula has a centralized power system where the governor has a wide spectrum of powers and the ability to control and affect the process of construction in Tula region. In such a hierarchical power system, a lot depends on subjective opinion and actions of a single person or a group. Local authorities in Russia are limited in their powers and do not have stimuli for development, because of centralized system of finance distribution within cities and the country in a whole.

In addition to that, there is a quasi-legitimate institution called "Gradostroitelno-zemelny Sovet", which was introduced by the previous governor to legitimize some dubious construction decisions and make an illusion of consultancy and dialogue between experts. Although this institute does not have any legal power de jure, de facto its approval of a project means sanctioning of construction. This institute designed to authorize single projects works despite the existence of zoning and other official construction regulations.

There are and have been several conflicts in Tula concerning illegal construction. One of the most recent ones is taking place in the area near Tula Central Park. Some people living in that area addressed me and asked for consultancy. According to their data, which is documented, the construction permit for the building was issued for one building while what is actually being built is another one. The developer first provided the official institution with one plan and after getting the construction permit the document was substituted (the citizens have a photo-proof of that: they took a picture of the plan before the permit was issued and they communicated with the issuing institution after the permit was issued).

The fact that the document was substituted indicates the case of bribery. Although the actual project is probably built with numerous violations of zoning, it should not be considered in this case, as, according to Russian construction laws, those projects, which are not built in accordance with the plan a construction permit was given for, must be demolished without considering whether they comply with regulations or not. The citizens do not want to apply to court, as they have already lost one similar case and had to pay their opponent's costs related to the trial. They do not want to do it again, because they do not believe it is possible to win such a case. Neither do they want to organize protest manifestations. They try to resolve the problem using indirect channels which could, according to their belief, influence the developer: writing letters to senators, communicating with NGO's, etc. They see writing a letter to the governor as an effective means to a solution.. They are told by some officials that they will not succeed in any case, because constructor has some influential contacts. It is obvious in such circumstances that an advocate planner should have broad qualifications, as sometimes it is impossible to work within certain rules and formal mechanisms.

There are no or almost no local communities in Tula (which I believe is characteristic for Russia), which can be considered the basis for civil activism and for fighting conflicts when legal system is incapable of that. Local communities in Russia are substituted by formal institutions called "tovarishchestvo sobstvennikov zhilya" ("Partnerships of landlords") which are supposed to solve some problems concerning their property but do not stipulate any emotional connections or shared identity. Usually citizens unite against but not for something in Russia, and after the problem is solved or they reconcile with the circumstances, their ties vanish. Nonetheless, the author's experience shows that there are some issues around which people can unite not because of pressure but because of their will to improve something. For example, an activity aimed at beautification of a historic cemetery in the centre of Tula attracted about 30-40 unfamiliar people within a month without any significant

promotion.

Some forms of civil participation were and are present in Tula, but they are mostly nominal. For example, at the web-site of Tula Administration some opinion polls are made from time to time, but usually such polls are focused on secondary problems like those of how should a new monument look like or whether the city needs art objects or not, but not city strategic development or budgeting. Usually, very few people participate in such polls and their results are not always, if at all, implemented.

One form of public participation which can be considered effective is the platform Open Region, which is an on-line service through which one can indicate existing city problems, mark them on a map, write a complaint and then competent official will consider it and react. There is a map with accomplished renovations and comments about the citizens' complaints.

Another effective form of participation is the "Civil budget" project, where some projects of the citizens get co-founded by the Administration. The project takes place in 2015-2016 and there is no information whether it will be implemented again.

The very concept of participatory planning was introduced in Tula for the first time in 2016 by a team of civil activists called "Mozhem sami" – one of the first civil activist movement in Tula – and the author is one of its core members. In the next section I will discuss how it emerged and developed until the moment non-political civil activism expanded to political processes.

3.2. Mozhem Sami: the birth of civil activism in Tula

The author started his experience of civil activist in 2015 at the age of 22. Before that, he started to study urban planning in Moscow in 2014. Civil activism was not related to the author's thesis and was considered by the author as an accomplishment of his professional duty to his hometown. The experience started with organizing an educational event for citizens aimed at stimulating their civil activity. The preparations started in January 2015, and the event took place in June. As a part of the preparation for the event the author conducted an on-line survey related to Tula citizens' leisure and activity mentioned above. 169 People took part in the survey, and 10 were left out as they were not from Tula. Out of the rest, 38% organized events of different scale for other people. In the survey there was a question for those who organized events about whether they were ready to contact me. Half of them answered "yes", but only one of them actually did contact. Consequently, that person got one of the event's co-organizers. Further, he became one of the leaders of the movement "Mozhem sami | MSMI" (MSMI).

By the time the first event took place, there were about 300 people in the MSMI online-community. Although the number of members in an online-community should not be considered as meaningful data per se, it can give some insights when taken with other information. However, the movement had not been shaped yet by then, and the group was called "Citizen's Day" after the name of the first event the team organized. After the event the core of the team consisting of 3 persons was shaped. The team was named "Mozhem sami" (lit. «We can do it ourselves»). I consider this period to be the birth of civil activism in Tula, as by that moment it was the only horizontal grassroot initiative which pursued broad goals of promoting conscious citizenship (other communities are more narrow-focused) and emerged not being a part of some large network.

Within two months the number of members increased to about 15 active and about 25-30 members overall. The core consists of youth aged between 20 and 27, although there was one member 61 years old. MSMI never proclaimed any age, gender, sexual orientation, etc. The team's main activity was organizing various events and showing with this that any citizen can do the same. The underlying idea was that one should consider their hometown as an object of creation rather than that of consumption. Although the original philosophy has always been preserved, it got less articulated in the course of time, which gets clear from the changes in the events' formats from more educative and creative (lectures, workshops and beautification and cleaning activities) to more entertaining (parties and fairs). As far as ideology is concerned, it has always contained some provocation and protest: there is a connotation "We can do it ourselves because you can't" in the name of the movement as an appeal to local government. However, it is always officially proclaimed that "ourselves" means "all the citizens together without any divisions and boundaries", which was also true but hid another part of reality. Of course, many people understood the first connotation too

The first large event organized by MSMI (ant the largest one by June 20, 2016) was the city picnic "Mozhem sami" held on the 29th of August 2015. According to the data of the police, 3000 persons

attended the picnic. There were about two dozen activities: workshops, lectures, concert, English classes, dances, etc. The picnic received extremely positive feedback, and many guests acknowledged that it was a unique event for Tula. However, Tula was quite late in introducing grassroots picnics. Such events already took place several times in Omsk and one time in Penza. After the picnic the number of the community followers grew up to 900.

Now there are about 2200 members in the online community, which is a success, because Tula most famous non-profits online communities consist of maximum 1,5k members except for "Mamkompaniya" (a hybrid of words "mother" and "company"), which has about 4000 members. Presumably, the reason for such a rapid growth is that the goal of "Mozhem sami" was broader than that of most communities, which are more narrow-focused.

After 3 months' the movement got its own room in a creative space called "Likerka Loft" – the only creative space in Tula so far, which is situated about 2km away from city centre at the city's central street Lenin Prospect. Despite the uniqueness and very good location, the vacancy rate of this space is about 40% according to its director (actually, it seems like 60%, because it is very empty there) and there is a continuous flow of tenants in the space. Likerka Loft has no conception and no event program, neither has it a PR team. The rental policy is also inflexible there with too high prices. The Director's inviting us was a step to attract visitors to that space.

At some moment an official who was involved in the redevelopment on some brownfiled projects in Tula's historic centre contacted MSMI. He collaborated with the developer and tried to involve new experts in the development of the project's concept. He appreciated the ideology of MSMI and invited them to participate in the project. Finally, "Mozhem sami" team conducted preparatory research for this project and made the concept of its redevelopment. The project called "Small Tula" was not completed, as the investor did not get the land on satisfactory conditions, but it got the start of MSMI participation in political and parapolitical processes.

This person is an official who is subordinated directly to the Governor of Tula Region and heads Tula Headquarter for Strategic Development. This Headquarter is a consultative institution and deals with various issues related to Tula city problems. It serves as a communicative ground for different experts. The leaders of "Mozhem sami" were invited to participate in Headquarter meetings related to public spaces in the first half of 2016. Until this moment, the idea of participatory planning was unknown for most of the public and for some experts.

With his help, "Mozhem sami" organized public presentations and discussions on several relevant topics concerning various problems of the city and of the youth in particular, which were attended by 30 to about 150 people. He helped to involve various officials and businessmen in the discussion using mailing. He managed to present the events as those sanctioned by the government of Tula, which was an effective mechanism to attract those people to the meetings, although very few actively took part in the discussion.

3.3. Current political situation in Tula

These events and discussions started being held during the office of the previous governor Vladimir Gruzdev, who resigned in February 2016. After his resignation, the Minister of Defence of Tula Region Alexey Dumin was appointed Governor-in-chief. Remarkably, many activities of the officials at that moment got frozen. It was related to their waiting for the Governor's-in-chief first steps, which could inter alia result in the change of political course and substitution of some officials by new ones. In fact, no serious changes followed, although some new officials, presumably those close to Dumin, were appointed.

The elections of a new Governor will take place in September 2016. For political reasons, there is no doubt he will be the next Governor, and he needs high rating only to decrease protest and unrest risks. In order to do this, he proclaimed several ambitious steps in the development of Tula and the Region. He initiated the development of new strategic plan for Tula until 2021. In order to do this, several expert groups were organized. The author participated in the group, which dealt with public spaces, headed by the aforementioned official from Tula Headquarter for Strategic Development. Along with these groups, experts from Moscow were invited, but they, presumably, had some different responsibilities, and, therefore, did not take part in the expert meetings mentioned above, however illogical it may seem.

Together with this, one large expert meeting involving all the groups was held. It was aimed at collecting ideas for the Strategy. The meeting was held by some organization from Moscow, which

specialized in organizing foresight sessions and doing strategic planning. They were told that they had to prepare the Strategy in 2 months (these were the words of one of the organizers of the meeting), which seems impossible for such important and fundamental documents. Such short terms may indicate that the steps performed by the Governor-in-chief are mostly declarative.

The period from February 2016 to September 2016 can be considered a period of gaining people's trust and reputation. Such a time can be viewed as a time of opportunities for civil activists and all the citizens, because while trying to achieve his aim before the elections, it is beneficial for the Governor-in-chief to take into consideration popular opinion. In addition, he actively uses consultancy, although relies more on experts from Moscow and St. Petersburg. In their turn, these experts communicate with citizens, and there is a chance that they will transmit some of their messages to Dumin. In such circumstances, civil activists and experts are more likely to be contacted (and they actually are), as they are considered opinion leaders and probably more competent persons. If an activist is also an expert, he or she is able to give important feedback, which will get to the governor, which in fact determines the way the Region will develop. There is no guarantee that every message will be received, and even less chance that any ideas will be implemented. In addition, during such periods the possibility of reforms is higher than in the periods after elections. One of the main advantages of such periods is that one can bring to surface issues which were hidden before. Even if the changes stipulated in some ideas will not be implemented, the awareness of some issues among the officials and the citizens will increase.

Right now the activity of local expert groups has finished, and the draft of the Strategy has been presented to the public recently. Noteworthy, its essential part is 19 pages long, which speaks for itself. The part in which I participated is less than a column long and is far too general in comparison to what was discussed at the expert meetings. This can again point at the declarative character of the transformation or signify that the provisions provided by the experts will be presented in further documents.

4. CONCLUSION: REFLECTION AND PRACTICAL RECOMMENDATIONS

Because all these political processes are still in progress, it is too early to predict definite outcomes and to say that civil activism turned out to be an effective way of promoting participatory planning. Still, it is possible and useful to reflect on MSMI dynamics so far and to draw some preliminary conclusions. The case of MSMI repeats the path along which radical planning is unfolded as mentioned by Beard (2003), when primarily subtle disagreement finally turns into open opinion statement, although it is clear that MSMI has not yet passed all the stages of radical planning, as it has not yet led to social transformations and probably will achieve it in foreseeable future. The outcomes of MSMI's activity seem insignificant, but in fact they are impressive when one considers the context in which all MSM activity takes place. In less than a year, without any contacts in the government in the beginning, our movement started to participate in expert meetings (I however had background in urban planning) in consultative institutions subordinated to the governor, who makes all the significant decisions in the region. The movement succeeded in bringing to surface the idea of participatory planning, which is itself a great achievement., active members of the movement gained new competence and skills. The future of the movement is unclear, as now it is in the state of decline. Anyway, it is an important case for understanding how is perceived in restrictive hierarchical environments, how they are promoted and why being an activist is useful for a planner.

To sum up, in authoritarian states civil activism can get an effective means of promoting various concepts and practices like participatory planning in authoritarian regimes. In a broader sense, it can be a strong driver for social change in any society. In order to bring or stimulate this change one should keep in mind following:

- If an activist is also an expert in some issues related to planning, social development and other areas, it is always a strong advantage, especially when the activist serves some ideals like better society.

- In authoritarian countries one should first seek for governmental approval and conceal their disagreement in order not to be oppressed and better to be supported.

- Such social change may last many years and one should be extremely patient waiting for the outcome.

- Periods of change (like elections, even if they are flawed) are periods of opportunity for introducing new ideas and moving towards social change.

- Soft power is more appropriate for those who disagree with current situation to foster social transformations.

- In order to be better accepted, one should proclaim positive rather than negative demands ("we are for our city", not "we are against corruption"), even if the latter seem more honest and true.

- Any statements of activist group should be accompanied by appropriate and consistent actions.

- An activist planner should act very cautiously, as their actions may finally be considered dangerous by the government.

- Gaining government's credibility is one of the most important tasks on the way to social transformation.

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A new dawn for the South African planning system

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The paper explores the policy and legislative transition of the planning system in South Africa from what we had, to what we need to create viable communities. We have transitioned from the apartheid system which was predicated on a grand idea of separateness effectively segregating land use and settlement patterns on the basis of race and ethnicity thus resulting in misguided policies that worsened and distorted spatial configuration. This distorted spatial legacy is now giving way to a position wherein all communities have equal rights to access of amenities and protection thereof. It therefore stands to reason why South African planners, as agents of change, are at an opportune period to use the enhanced tools available to create the communities they want to live in, and hence fulfil the narrative of democracy this country prides itself in. It will also provide the mechanism on how best the planning policies and legislative framework can be amended to address the current socio-economic challenges and the imbalances of the past.

1. BACKGROUND

Gone are the days when the planning profession served the interests of a few, dispossessed the masses to advance the cause of the minority, and when planning was a tool for unjust governments to perpetuate their perverse political ideologies. The new political democratic dispensation in South Africa ushered a vista of opportunity for planning thinkers immersed, not just in its formal aspects, but imbued with adequate conviction to make qualitatively substantive difference within the prescripts of the law. Such conviction being driven by the desired progressive outcome, the willingness to challenge the status quo, and the lengths one is prepared to go to give life and meaning to policies. In the South African context where the planning system is, the Spatial Planning and Land Use Management Act, No 16 of 2013, provides a novel and uniformly and nationally applicable regulatory tool which is aligned to the democratic Constitution. The timing has never been as appropriate as the present.

2. PROBLEM STATEMENT

The pre-democratic apartheid planning policy and legislative framework created a system of racially-based land use and spatial segregation in which the places where a person lived was dependent on a narrow ethnic and race classification. In consequence, the poor were pushed to the most unproductive strips of marginal land in the periphery and rural areas with limited or non-existent social-economic facilities. Since 1994, the democratic government has introduced a number of policies and legislative frameworks enabling development programmes designed to forge and promote a united and non-racial South Africa. Guided by the parameters of the planning framework and giving effect to the development principles, the response to the many challenges our communities face can now be targeted. The post-1994 legislative reform including and most especially the Spatial Planning and Land Use Management Act (the SPLUMA) has introduced a the concept of normative planning in terms of which certain development principles offer us ammunition to advocate and pursue positions that will advance poor communities, lobby for improved resource allocation and the incremental inclusion of previously disadvantaged communities into orderly developed neighbourhoods. These development principles enshrined in SPLUMA are: (i) Spatial Justice; (ii) Spatial Sustainability; (iii) Spatial Efficiency; (iv) Spatial Resilience; and (v) Principle of Good governance.

3. THE HISTORY OF PLANNING IN SOUTH AFRICA: PRE-1994

Planning, though not susceptible to exact definition, may be broadly understood to relate to a myriad of activities all of which are undertaken by different professions. In essence, planning is a process of integrating thoughts and ideas from a multitude of other disciplines that are then applied in space to achieve defined socio-economic objectives, to manage the sensitivity of the environment, to inform public transport facilities and installation of infrastructure services, and design of human settlements. It involves making informed decisions about the future use and development of land and striving to create a better and sustainable living

The paper explores the policy and legislative transition of the planning system in South Africa from what we had, to what we need to create viable communities. We have transitioned from the apartheid system which was predicated on a grand idea of separateness effectively segregating land use and settlement patterns on the basis of race and ethnicity thus resulting in misguided policies that worsened and distorted spatial configuration. This distorted spatial legacy is now giving way to a position wherein all communities have equal rights to access of amenities and protection thereof. It therefore stands to reason why South African planners, as agents of change, are at an opportune period to use the enhanced tools available to create the communities they want to live in, and hence fulfil the narrative of democracy this country prides itself in. It will also provide the mechanism on how best the planning policies and legislative framework can be amended to address the current socio-economic challenges and the imbalances of the past.

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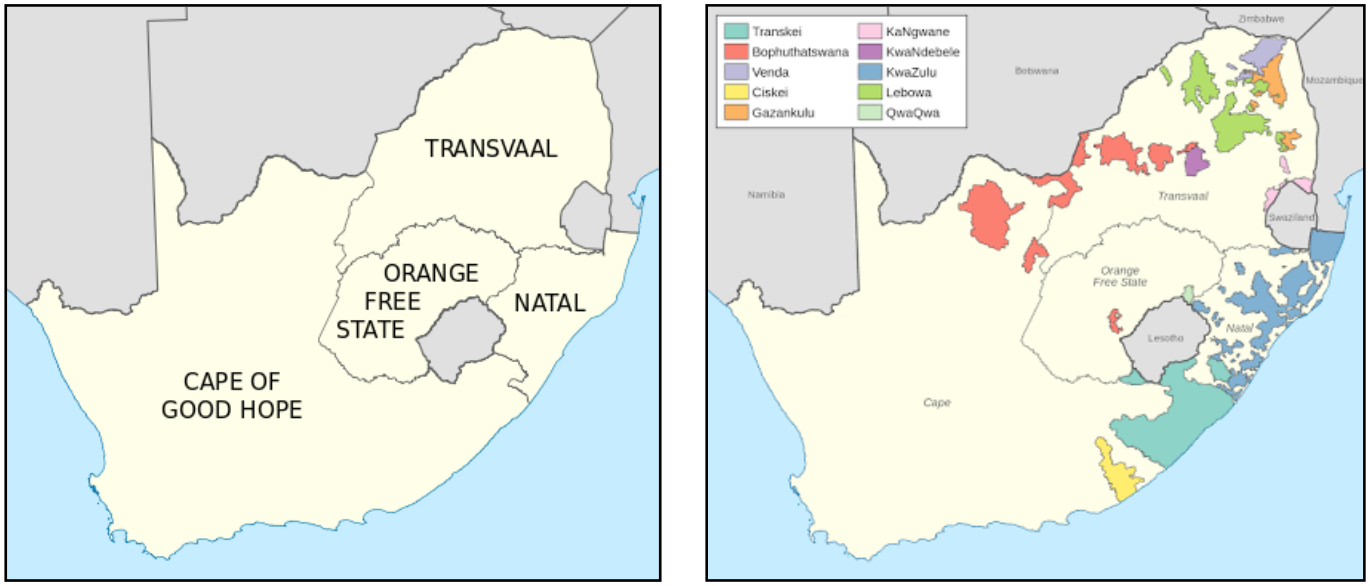
Gone are the days when the planning profession served the interests of a few, dispossessed the masses to advance the cause of the minority, and when planning was a tool for unjust governments to perpetuate their perverse political ideologies. The new political democratic dispensation in South Africa ushered a vista of opportunity for planning thinkers immersed, not just in its formal aspects, but imbued with adequate conviction to make qualitatively substantive difference within the prescripts of the law. Such conviction being driven by the desired progressive outcome, the willingness to challenge the status quo, and the lengths one is prepared to go to give life and meaning to policies. In the South African context where the planning system is, the Spatial Planning and Land Use Management Act, No 16 of 2013, provides a novel and uniformly and nationally applicable regulatory tool which is aligned to the democratic Constitution. The timing has never been as appropriate as the present.

2. PROBLEM STATEMENT

The pre-democratic apartheid planning policy and legislative framework created a system of racially-based land use and spatial segregation in which the places where a person lived was dependent on a narrow ethnic and race classification. In consequence, the poor were pushed to the most unproductive strips of marginal land in the periphery and rural areas with limited or non-existent social-economic facilities. Since 1994, the democratic government has introduced a number of policies and legislative frameworks enabling development programmes designed to forge and promote a united and non-racial South Africa. Guided by the parameters of the planning framework and giving effect to the development principles, the response to the many challenges our communities face can now be targeted. The post-1994 legislative reform including and most especially the Spatial Planning and Land Use Management Act (the SPLUMA) has introduced a the concept of normative planning in terms of which certain development principles offer us ammunition to advocate and pursue positions that will advance poor communities, lobby for improved resource allocation and the incremental

Figure 1. Four provinces created in 1910 & Ten Bantustans created in 1910. Source: sahistory, online



inclusion of previously disadvantaged communities into orderly developed neighbourhoods. These development principles enshrined in SPLUMA are: (i) Spatial Justice; (ii) Spatial Sustainability; (iii) Spatial Efficiency; (iv) Spatial Resilience; and (v) Principle of Good governance.

3. THE HISTORY OF PLANNING IN SOUTH AFRICA: PRE-1994

Planning, though not susceptible to exact definition, may be broadly understood to relate to a myriad of activities all of which are undertaken by different professions. In essence, planning is a process of integrating thoughts and ideas from a multitude of other disciplines that are then applied in space to achieve defined socio-economic objectives, to manage the sensitivity of the environment, to inform public transport facilities and installation of infrastructure services, and design of human settlements. It involves making informed decisions about the future use and development of land and striving to create a better and sustainable living environment for people. For example, the grid pattern planning approach has been exercised in most towns throughout South Africa and is still popular today for its simplicity and cost effectiveness. This approach emanates from the early Cape Dutch settlements that followed the European grid pattern with residential areas laid out in blocks around gardens and public land such as the town square. During the 1930s and 1940s, Town Planning Ordinances were introduced in different Provinces to manage the development in urban areas and new settlements. Municipalities were required to prepare Town Planning Schemes for formal urban areas in line with Town Planning Ordinances. Town planning schemes were used primarily to allocate zonings in different areas to make a clear division of land uses and residential types. Legislative backing is therefore critical to effect the change much needed.

3.1 The early planning legislation: pre-1994

1910 is the year in which South Africa was forged, as a Union. Not coincidently, that was also the year in which the Department of Native Affairs was created. Three years later, the Union's parliament passed the Natives Land Act (Act No 27 of 1913), which formally ushered in race-based land segregation as the fundamental national policy. During the 19th century, the apartheid government used its legal authority to set up distinct juristic boundaries, operating in parallel, such as the establishment of concentration camps and the establishment of South Africa's Bantustans/homelands. The decade of macro-segregation and separation division of Bantustans/homeland from white South Africa from the early 1970s resulted in the creation of a complicated legal framework in the country. Four provinces (Transvaal, Orange Free State, Natal and Cape of Good Hope) were created in 1910 and ten Bantustans/homelands (Bophuthatswana, Ciskei, Gazankulu, KaNgwane, KwaNdebele, KwaZulu, Lebowa, Qwaqwa, Transkei and Venda). (Oranje and Berrisford, 2015: Online).

3.2 The 1913 Natives Land Act (Act no. 27 of 1913)

The 1913 Natives Land Act was one of the first pieces of legislation that limited the property rights of Africans in South Africa. Africans were only allowed to buy land in the selected areas, which were known as bantustans/homelands (Bophuthatswana, Ciskei,

Figure 2. Nine South African provinces created after 1994
Source: southafrica.info

Gazankulu, KaNgwane, KwaNdebele, KwaZulu, Lebowa, Qwaqwa, Transkei and Venda). (Pepeteka, 2013: 1).

Through the 1913 Natives Land Act a vast proportion of the total land mass was reserved for the use of people classified as 'White', and those classified as 'Black' were located in the urban outskirts and rural areas, areas with limited public transport system, economic opportunities, job opportunities etc. Under the apartheid government, black residents were forced to live in "sprawling, squalid dormitory townships of undifferentiated 'matchbox' houses. These were relatively poorly serviced with infrastructure and urban amenities, and were virtually devoid of work opportunities or shopping and entertainment facilities. (Pepeteka, 2013: 1).

3.3 The Natives Urban Areas Act (Act no. 21 of 1923)

The Natives Urban Areas Act regulated the presence of Africans in the urban areas. Local authorities were given powers to demarcate and establish African locations on the outskirts of the urban industrial areas. Africans who were living in the so-called white areas were forcefully moved to the locations. Segregation, pass law control and housing were used as a strategy to define 'Black Africans' urban residential (Hendler and Wolfson, 2013: 3).

3.4 Provincial town planning ordinances (various: 1930 – 1940)

To regulate land use management in the urban areas within the former South Africa, and largely to the exclusion of the former non-White areas town-planning and township Ordinances were enacted for each of the four provincial administrations within South Africa. The main focus of these Ordinances was to control development in urban areas of each province. It did not provide guidelines for development in rural areas. It also had less focus in the locations since its main focus was urban-biased.

3.5 The Population Registration Act (Act no. 30 of 1950)

In 1948 the National Party (Former Apartheid Ruling Party) implemented its vision of a segregated racial ideal. After passing the Population Registration Act of 1950, it sought to segregate the officially identified races. The Act provided for compulsory racial classification on a national register. Documents were issued to people based on designated racial groups in terms of the Act. Groups were classified as Europeans, Coloured, and Black Africans.

3.6 The Group Areas Act (Act no. 41 of 1950)

The Group Areas Act orchestrated segregation in the control of transfer of land and immovable property as well as occupation rights. The main objectives of the Act were used to control the life and the movement of urban Black Africans, Indians and Coloured people. The primary objective of the Act was residential separation, to curb the movement of the non-whites from rural areas into big cities and so-called Whites only areas. The apartheid government set up semi-urban townships for Black, Indian and Coloured population groups. (Sa history, Online)

The apartheid government justified Group Areas removals in many different ways. It claimed that racial mixing bred conflict. It alleged that the Act was designed to eliminate friction between the races. Removals were seen as necessary for halting urban decay and were construed as generous. Segregation, rather than better policing, was promoted as the solution to crime.

4. RELEVANT PLANNING LEGISLATIVE AND POLICY FRAMEWORK: POST-1994

On 27 April 1994, South Africans participated in the first democratic government elections where about 19.7 million voted including Black, Indian and Coloured population groups who were previously not allowed to vote in terms of the regulations set out by the apartheid government Electoral Laws. 27 April 1994 marked the end of over three hundred years of colonialism, segregation and white minority rule. The late Dr. Nelson Mandela was elected as the first President of democratic South Africa. The former Bantustans/homelands were reintegrated and four provinces were divided into nine. The main objective of dividing provinces into nine was to decentralised government services and brings services closer to the people.

The victory over the Apartheid State in 1994, set policy makers in all spheres of government a massive task of overhauling the social, political, economic and cultural institutions of South Africa to bring them in line with the imperatives of a new democratic order. (Donalson, 2001: 1 cited in Asmal, 2001).

South African cities and towns entered the 1990s with an apartheid urban planning and development legacy. Town planners and politicians responsible for town planning and development were faced with a huge task of reconstructing a spatially segregated, highly fragmented and dispersed urban

society, and had to achieve urban-rural integration. Restructuring, transforming, reconstructing and integrating separate and divided cities posed pertinent spatial planning challenges. Since 1994, much has changed around urban development in terms of the legislation, institutional frameworks, policies and strategies. Numerous pieces of national legislation, policy and strategy have been developed since 1994 to transform the stubborn residue of apartheid. National legislative tools that have sought to redress past imbalances include, inter alia, the RDP (1994), the Housing White Paper (1994), the Development Facilitation Act (1995), the Urban Development Strategy (1995) and the White Paper on Urban Development (1997), the Green Paper on Development Planning (1990), the White Paper on Local Government (1998), the White Paper on Spatial Planning and Land Use Management (2001), the Demarcation Act (1998), and the Municipal Systems Act (2000), Housing Act (1997); Municipal Structures Acts (1998); Environmental Management Act (1998); Social Housing Act (2008); and the recent Spatial Planning and Land Use Management Act (2013). These were introduced by the democratic government with an objective to address segregation and promote spatial justice, spatial equity and integration of communities.

Government has tried to address the imbalances of past orchestrated apartheid planning. The wide range of development planning challenges which government, has been faced with are transportation planning; environmental planning; infrastructure planning; housing; land reform; socio-economic planning and land use planning. These challenges are more pronounced in local government.

4.1 The 1994 Reconstruction and Development Programme

In 1994, the democratic government led by the African National Congress introduced the Reconstruction and Development Programme (RDP) as the country's socio-economic policy framework. The main objective of the RDP was to alleviate poverty, and address the massive shortfalls in social and economic services.

4.2 Restitution of Land Rights Act (Act No. 22 of 1994)

In pursuance of its grand policy of separateness the Apartheid State forcibly removed and relocated several non-white South Africans. Land and land rights were lost in both the urban and rural spaces. As part of the post 1994 land reform programme the Restitution sub-programme seeks to redress lost possession and ownership rights, and where restoration was not feasible compensate people who have been dispossessed of their land through discriminatory laws since 1913. The Restitution of Land Rights Act was one of the first pieces of legislation passed immediately after the democratic dispensation came into being. The Act fulfils the requirement of section 25(7) of the Constitution as it entitles a person or community dispossessed of rights in land after 19 June 1913, as a result of racially discriminatory laws or practice, to claim restoration of those rights or equitable relief in the form of alternative land or compensation. (Pepeteka, 2013: 3).

4.3 Local Government Transition Act, 1993 (Act No. 209 of 1993)

It was introduced as a government interim attempt to reorganise local government affairs and introduced Integrated Development Plans as a planning tool for local government.

4.4 Constitution of the Republic of South Africa (1996)

The Constitution is the supreme law of the country. It provides the direction in terms of roles and responsibilities for national, provincial and local government in relation to development planning. Chapter 2 of the Constitution outlines the Bill of Rights for the people of South Africa, section 24 outlines the right to environment that is not harmful, section 25, outlines the right to property; and section 26, the right to adequate housing. Housing, property and environmental elements are the factors in spatial justice.

4.5 The Development and Facilitation Act (Act No. 67 of 1995)

The Development and Facilitation Act of 1995 (DFA) intended to guide all physical planning and development, premised on the ideal of a compact and integrated city. The main aim of the DFA was to fast track land release for development in particular Reconstruction Development Programme initiatives. It was seen as being a tool to assist local governments in providing a short-term (five year) solution to urban and rural development restructuring. The principles of the Development Facilitation Act included restructuring of the spatial environment aimed at correcting the racial settlement pattern, general city-building principles that encourage compact cities and prevent further urban sprawl, along with mixed land use and integrated development,

promoting the creation of sustainable cities and a transparent process of public participation, and associated capacity building.

4.6 Housing Act (Act No. 107 of 1997)

The key objective of the Housing Act (1997) is to provide for the facilitation of a sustainable housing development process and development in line with the National 2009 Housing Code. The Act makes provision for policies and processes involved in housing development i.e. urban and rural housing development.

4.7 The National Environmental Management Act (Act No. 107 of 1998)

The main objective of the National Environmental Management Act is to promote sustainable development, which is to ensure balance and integration between social, economic, and environmental factors into planning, implementation, and decision making to ensure that the environmental serves both present and future generations.

4.8 The Local Government: Municipal Demarcation Act (Act No. 27 of 1998)

The Act provides for criteria and procedures for the determination of municipal boundaries by an independent authority. The aim of municipal restructuring is to assist in redressing the imbalances of the past and the inequalities in public service. The Act also assists to address the rural-urban divide and integrate economic and social development.

4.9 The Local Government: Municipal Systems Act (Act N0. 32 of 2000)

This Act outlines the way Municipalities operates and brought about modern day Integrated Development Planning.

4.10 Social Housing Act (Act No. 16 of 2008)

The provide guidelines for the establishment and promotion of sustainable low-income rental housing. It defines the functions of national, provincial and local governments in respect of social housing. It is as an instrument used to pursue restructuring of South African cities, this is essentially about integration: economic, racial and social. Restructuring is largely about moving away from housing interventions that entrench or in any way maintain the spatial status quo, which reinforces certain social and economic disparities.

4.11 National Development Plan 2011 (Vision 2030)

The National Development Plan is a plan for the country to eliminate poverty and reduce inequality by 2030 through uniting South Africans, unleashing the energies of its citizens, growing an inclusive economy, building capabilities, enhancing the capability of the state and leaders working together to solve complex problems. The plan has the following high-level objectives to be achieved by 2030 (i) reduce the number of people who live in households with a monthly income below R419 per person (in 2009 prices) from 39% to zero and (ii) reduce inequality, as measured by the Gini coefficient, from 0.69 to 0.6.

The plan also have a high level objective of new spatial norms and standards – densifying cities, improving transport, locating jobs where people live, upgrading informal settlements and fixing housing market gaps. (National Development Plan, 2011)

4.12 Spatial Planning and Land Use Management Act (Act No. 16 of 2013)

The Spatial Planning and Land Use Management Act (SPLUMA) was passed by Parliament in August 2013 and it came into effect on 1 July 2015. It is a single planning legislation for the country which repealed the Development Facilitation Act (Act No. 67 0f 1997), amongst others. The Act aims to develop a new framework to govern planning permissions, approvals, set parameters for new developments and provides for different lawful land uses in the country. It is also to provide a framework for policies, principles, norms and standards for spatial development planning and land use management to address the spatial and regulatory imbalances, to promote greater consistency, and uniformity in the application procedures. The Act sets out five development principles which intends to address the spatial development planning imbalances of the past which are (i) Spatial Justice; (ii) Spatial Sustainability; (iii) Spatial Efficiency; (iv) Spatial Resilience; and (v) Principle of Good governance. The emphasis is more on spatial transformation and spatial equity. The Act gives powers to local authorities to perform and make informed decision on spatial planning and land use planning matters.

5. PLANNING LEGISLATIVE GAPS AND PROPOSED AMENDMENTS

Since 1994 government has introduced and enacted many different planning related policy and legislative frameworks. The most recent one is the SPLUMA. Despite the government's lofty aim to introduce new legislative framework for planning there is a gap in terms of different policy requirements in relation to spatial and land use planning. This gap requires urgent attention in terms of amendment of certain pieces of legislation and policies to address and achieve the goals of the National Development Plan (NDP), the SPLUMA and Provincial Growth and Development Strategies (PGDS). Below is the list of legislative and policy frameworks that requires urgent amendments. Below is the list of legislative and policy framework that requires urgent amendments:

- The Constitution of the Republic of South Africa Act (1996): To address spatial justice in line with Section 26 (1) and revisit the words 'rights"; "access"; and "adequate". Address principle of good governance.

- Housing Act (Act No. 107 of 1997 as amended in 2001): To address spatial justice and human settlements objectives (Part 1). Since 2009 housing departments and programmes were changed to human settlements but the act itself is still called "Housing Act". Address principle of good governance.

- National Environmental Management Act (Act no. 107 of 1998): To address spatial transformation and flexible development procedures and processes. Chapter 1 (Section 2). Address principle of good governance.

- Municipal Demarcation Act (Act no. 27 of 1998): To address, accordingly spatial elements in relation to municipal boundary delimitation every five years. Chapter 2 (section 21). Address principle of good governance.

- Municipal Systems Act (Act no. 32 of 2000): To address spatial transformation in the planning processes. Chapter 5 (Section 26). Address principle of good governance.

- Social Housing Act (Act no. 16 of 2008): To address spatial justice in line with restructuring zones objectives. Chapter 1 (Section 2). Address principle of good governance.

The most common objective of the current government planning policy and legislative framework is spatial justice, spatial transformation, spatial equity, urban rural integration, and densification. In a nutshell, sustainable development, takes into consideration the four development cornerstones i.e. social, economic, environmental, political aspects. There has to be further explicit legislative backing to achieve the ideals of a democratic South Africa, and as such the Constitution, the Housing Act, Municipal Systems Act, Municipal Demarcation Act, National Environmental Management Act, Social Housing Act, needs to be amended.

The legislative gaps become apparent when development is initiated in different levels of government, where two or more development policy or legislative framework with the same service delivery objectives contradicts one another. This occurs primarily by the difference in the period of promulgation. Government's main objectives are provision of services in such as human settlements, water, sanitation, electricity and creating conducive environment for economic development. To ensure delivery thereof, well aligned policies and legislative framework are essential. The recently enacted piece of legislation, the SPLUMA, provides clear direction to be taken by different spheres of government in dealing with issues of service delivery i.e. development principles and emphasis is to be put on the principle of good governance which will enable all key stakeholders to work together in a coordinated fashion.

6. CONCLUSION

Redressing the legacy of apartheid spatial planning and settlement patterns require no less than the same type of instruments used to impose them in the first instance. While a lot of progress has been achieved in the regulatory and policy space, the realisation of spatial transformation can only be realised through further amendments of certain planning laws to deal decisively with the inequalities and the imbalances of the past. Amendment of South African planning policy and legislative framework is urgently needed in order to address spatial challenges and imbalances of the past as a result of the apartheid planning processes. Spatial integration can only be addressed through the review of legislative and policy framework and the alignment of national, provincial and local spheres of government roles and responsibilities.

The focus should fall sharply on spatial justice (access to land by disadvantaged communities; flexible management of disadvantage areas,

Informal settlements, former homelands; access to secure tenure, incremental upgrading of informal areas) and spatial equity which are the focal points in the National Development Plan and the Spatial Planning and Land Use Management Act (Act No. 16 of 2013). As planners, we remain hopeful that it is a new dawn for the South African planning systems and the opportunities to be change agents have been activated.

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Sustainable spatial governance in rural areas under traditional authority

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Limited attention was given in the past to spatial planning and land use management in rural traditional areas, giving rise to unsustainable practices. New legislation seeks to address this by imposing land use schemes in the entire municipal area, including the traditional areas. However, this also creates challenges, and in some cases, conflict between tribal authorities and the municipalities in which they fall. In response to these challenges, this paper proposes principles and a framework for more sustainable land use management in such rural areas.

1. INTRODUCTION

The 'homelands', created under colonial and subsequently apartheid planning in South Africa, are home to about one fifth of the population in the country. Although such areas currently fall within municipal boundaries, demarcated through post-1994 local government reforms, land allocation and land use management here is generally administered by traditional authorities and not directly by the municipality. This has led to dual land management systems, inefficient service provision and friction between traditional and municipal authorities, which arises from contested authority, informed by different perspectives concerning land and spatial governance.

Planning affects space, with land lying at the heart of it. From a western, materialistic perspective, land is a commodity, an asset but from an African perspective land is multi-dimensional, layered in cultural and social rights. It is a space that encompasses the past, present and future (du Plessis, 2011). Thus ownership, tenure and land use are perceived differently by different cultures. These cultural lenses influence planning as their unconscious assumption of a specific cultural perspective affects planners' approach to land and planning.

In South Africa, planners commonly confront this challenge of multiple cultural perspectives. Modern land management is still shaped by western modes of thinking and based on a largely technical rationality (Grunau and Schönwandt, 2010, Watson, 2009) that is future oriented (Connell, 2009) and embraces "the ideal of progress" (Rydin, 2011: 92). This western perspective differs from the traditional African view of time and space. Thus, any spatial governance system for rural areas requires a revised approach to planning, which at the very least acknowledges, if not embraces, traditional culture and worldviews.

Traditional leadership (TL) systems in Africa predate colonialism (Khunou 2009) and still play an important role in the political and cultural lives of communities, particularly in rural areas of the previous homelands. Despite the (mis)use of some tribal authorities by the colonial and apartheid state to subjugate the people, the institution is still held in high esteem (Beall, 2006) and is recognised in the Constitution of South Africa. However, the Constitution is not specific regarding the role of traditional leaders. While traditional leaders must be consulted on matters affecting their areas, and may attend municipal council meetings, they have no voting rights in the municipal council.

The Spatial Planning and Land Use Management Act 2013 (South Africa, 2013) (SPLUMA) has recently been enacted as a single piece of legislation to deal with the legacy of fragmented planning legislation and to promote spatially just, sustainable and resilient settlements However, although normative in its aims and principles, its provisions are largely based on a Western modernist, urban rationale that differs from the traditional African understanding of space, place and identity. The provisions of SPLUMA around spatial governance appears to conflict with the longstanding roles assumed by traditional leaders and it is this that has led to discontent, if not resistance among traditional authorities. If SPLUMA is to be implemented, it will require an approach that is collaborative, appreciative of traditional values and acknowledges indigenous knowledge, yet uses contemporary insights to direct planning towards greater sustainability and improved livelihoods for

the community.

This paper presents key principles and a framework that can form the basis for a functional spatial governance and land use management system in traditional rural areas. These proposals draw on concepts relating to social justice, sustainable development, indigenous knowledge systems and common pool resource management.

The next section is a short synthesis of the key principles and concepts mentioned above, drawn from existing scholarship. The section thereafter outlines five case studies undertaken by the authors that illustrate the challenges of spatial planning and management in areas under traditional authority. The framework for effective spatial governance is then presented. The paper concludes with some thoughts on the potential implications of improved spatial governance.

2. SPACE, TRADITIONAL CULTURE AND AUTHORITY, SUSTAINABLE DEVELOPMENT AND JUSTICE

Many challenges of spatial governance in tribal areas arise from traditional culture, the conceptualisation of land and customary land allocation practices. Improving the sustainability of development in this context can draw on common pool resource management and recognition of diversity and indigenous knowledge as discussed below.

2.1 Culture and traditional leadership

Culture impacts on and shapes space, giving it meaning and influencing identity. It defines our relationship with space. Culture is passed from generation to generation through symbolic learning and language. Planning must embrace this knowledge to identify with distinct cultures. Unfortunately, the domain of planning is one area of many where injustices against indigenous peoples occur because planning is an active cultural agent in space: cultural in the sense that it inhabits particular explanatory schemes and structures of meaning (Barry and Porter 2012; Watson 2009:173).

African culture is socio-centric rather than self-centric while personhood too, is defined relationally. Tribal authorities are a creation of local culture and thus embody the values of the community. A community exists if people mutually recognise the obligation to respond to one another's needs (du Plessis, 2011), while through active community participation, a person finds meaning in life. The heart of the customary discourse revolves around the 'imbizo', the gathering in which dialogue takes place.

Land in African cultures is a multidimensional space in which relationships are connected to the past present and future. Implicit in this is a religious view of land and its ancestral legacy (Thurman, 2008). Thus land constitutes a relationship between people, the clan and the community, including the future and the past (ancestors) and current relatives (Kingwell, 2008). This implies that land rights include various obligations and responsibilities to the family and community (Okoth-Ogendo, 2010).

The allocation of land is vested in the traditional authority. The chiefs (amakhosi) and headmen (izinduna) who manage the land in trust for the community, identify and allocate land – usually for members of the clan . Decisions are generally made in consultation and the outcomes of decisions reported back to the community through community meetings (izimbizo). However, the current system of TL was subverted by the colonial-apartheid governments for their own ends. Many authors aver that the institution is not democratic and no longer required (Ntsebeza, 2004; Beall et al, 2004, 2005). These views lie at the heart of the contestation of authority.

The allocation of land includes both tenure rights as well as land use rights that pertain to the use of land for a homestead, that may include land for crop and vegetable cultivation and grazing, where the latter may be communal land use rights (Sekonyela, 2014). Thus, traditional leadership is an intrinsic part of the indigenous knowledge relating to land management in rural areas of South Africa. It relates directly to the understanding and appreciation of communities of their local environments and is embodied in rites and ceremonies and other cultural practices (Lutz and Linder, 2004).

2.2 Common pool resource management and indigenous knowledge

The co-management of communal resources is the subject of a growing literature on common pool resources (CPR) (Ostrom et al, 2002). CPR concerns the use and management of shared ecosystems, generally by members of a defined and identified community. It is this definition of the community - the legitimate users and the 'rules' determining the users' access to resources - that differentiate common pool resources from common resources. The latter are most easily subject to Hardin's 'tragedy of the commons' (Ostrom, 2008). Much of the research on CPR has been on institutional arrangements particularly issues of co-

management along with community participation supported by good communication.

Effective institutions are deemed crucial as they embody and reinforce social values pertaining to the resource(s), including rewards and sanctions, as well the nature of information available to users (Agrawal, 2003). Other aspects such as homogeneity of the user's group as opposed to the degree of difference in wealth and social status are also significant. According to Husain (2008), where inequalities exist in the system, creating coalitions of users can generate greater equity. In an experiment based on game theory, Cárdenas and Ostrom (2004), discovered that face-to-face communication was the most important aspect for sustainable use of the resources.

Furthermore, the sustainable use if common pool resources is often linked to indigenous knowledge (Ostrom 2008) which is

> "a way of knowing acquired by local people over a period of time through accumulation of experiences as well as their intricate relationship with the environment. It informs the skills and practices of local people, collectively known as indigenous knowledge systems and is viewed as the sum total of knowledge and skills unique to a given culture" (Buthelezi & Hughes, 2014: 231).

Under colonial and subsequent apartheid rule indigenous knowledge was scorned in favour of modern scientific knowledge. A predominantly 'top-down' style that favoured technical approaches was employed that, more often than not, lead to failure (Ostrom, 2008; Buthelezi and Hughes, 2014). A growing awareness of the value of indigenous knowledge has been accompanied by recognition of cultural rights by the international community through the United Nations Declaration the Rights of Indigenous Peoples and the United Nations International Covenant on Economic, Social and Cultural Rights 1966. (World Bank, 2004; Gagnon and Berteaux, 2009; Ilied, 2011).

2.3 Diversity, justice and sustainable development

Multicultural space is impossible to imagine apart from inclusive democracy and principles of social and spatial justice. This presupposes an understanding of the exclusionary effects of both past and current planning (Watson, 2003, Barry and Porter, 2012). Consequently, planning too must accept diversity and different rationales from other ways of seeing the world (Sandercock, 2003). Significant shifts in the planning debate recognise planning not only as a product of expert technical reasoning, but as a process that embraces multiple actors through dialogue. Communicative action theory suggests that planning decisions should be reached through collaboration with stakeholders in a way that is fair, equitable and empowering (Innes and Booher 2010). Planners must accept other frames of reference if they are to accommodate different cultures with a greater sensitivity towards diversity; this includes appreciation for local ways of knowing and doing (Watson, 2003; Harrison, 2006).

Social justice is one of the cornerstones of sustainable development, along with the integrity of the environment and a viable economy that supports people and livelihoods (Syme and Nancarrow, 2001; Brandon and Lombardi 2011). Implicit in concepts of both social justice and sustainable development is the need for consultation – bottom up planning that not just recognises but incorporates local knowledge and communities' perspectives in the planning process (Haughton 1999; Healey, 2006).

Managing development in tribal areas demands respect for the local culture and indigenous knowledge. It also requires a participatory approach with appropriate institutions to ensure equitable access to resources while ensuring sustainability.

3. MUNICIPALITIES AND TRADITIONAL COUNCILS

All land in South Africa fall within a municipality. Thus, most municipalities include vast rural areas that may contain commercial agriculture or traditional areas (or both).. Municipalities must prepare five year plans, termed integrated development plans (IDPs) and spatial development frameworks (SDFs) that guide their planning and investment. Furthermore, SPLUMA now requires that municipalities prepare land use schemes for the entire municipal area, i.e. urban and rural areas.

Although TL is recognised in the South African Constitution, their role and rights are not clear. While legislation provides for up to twenty percent of the TL in a municipality to participate in municipal council meetings, they have no voting rights. Other legislation regarding TL authorises allows them to create Traditional Councils (TC) that include TL and other members of the community that are chaired by the local Inkosi (South Africa 2003). Traditional Councils and their wards do not necessarily coincide

with municipal boundaries or municipal wards where elected councillors represent the community.. Thus there may be several TCs within one municipal area, but not all their chiefs may be permitted to attend Municipal Council meetings.

4. CASE STUDIES

The case studies presented below were undertaken to understand what the issues are regarding spatial governance in rural areas. Qualitative research methods, based on open-ended questionnaires followed up with interviews were used, with respondents drawn from the local traditional leadership, municipality and provincial government through purposive sampling. The research was conducted between 2014 and 2015. Three case studies examined either municipalities or TCs, while two were conducted at a provincial scale.

4.1 Mahlayizeni Traditional Council area, KwaZulu Natal Province

The Mahlayizeni Traditional Council area is a rural area with few jobs and a small economic base. Most households rely on remittances or social grants and subsistence agriculture for their livelihoods (Nkandla Municipality, 2014). The access to the area is poor, which limits economic activity to a tea plantation, spaza shops , taverns and some sand mining. Nkandla town is the main service centre while one of the greatest Zulu kings, Cetshwayo, is buried in the Nkandla Natural Forest. Traditional homesteads that include the dwelling units, 'kraals' for livestock, fields and communal grazing are the dominant land uses.

Within this area are three systems of land-use management. The first is that undertaken by the municipality in urban areas and is based on western planning tools such as a zoning scheme and formal subdivisions. The second form pertains to land for commercial purposes that is managed through the Ingonyama Trust (in which all the tribal land in KwaZulu Natal is vested). The third system is that of the traditional authority. These systems do not necessarily communicate with each other. The municipality that is responsible for providing infrastructure may - or may not - be informed of new development approved by the Ingonyama Trust or the TC, which hinders planning and services provision. The TL allocates land for homesteads to members of the clan based on their indigenous knowledge and customs, but the municipality is not involved in this process.

According to the TL, the only time that they communicate with the municipality is during municipal council meetings or integrated development planning forums. According to the TL their input is not meaningful; it is only an exercise for compliance where the community is asked to ratify decisions already taken. Thus the TL have little or no influence on municipal planning. The municipality is also frustrated by the lack of communication that hampers planning and service delivery. According to municipal officials, the technical jargon used by the municipality confuses the TL and discourages them from fuller participation. All respondents maintained that better communication and an integrated land use management system that synchronises the planning systems is required. Consultation and collaborative planning is necessary.

4.2 Vulindlela, Msunduzi Municipality, Kwazulu Natal Province

While Nkandla is a deep rural area, Vulindlela is part of a municipality with a city (Pietermaritzburg) at its core. As Vulindlela abuts the city, it is attractive to both urbanising migrants and people moving from the city to the traditional area, where they no longer pay municipal rates or high charges for services. Modern services within the traditional area are limited: the roads are not paved and not all homes have electricity, while water has to be fetched from rivers. There is some subsistence agriculture with small vegetable gardens and herds of cattle, sheep or goats, as well as a thriving informal economy (e.g. knitting, sewing, wood-trading, spaza shops and liquor retailing). Many residents work in the adjacent urban areas, in commercial agriculture or mining.

Here too, the situation of three relatively independent land use management systems prevails, but because of the growth of the area, the consequences are more problematic. One homestead may accommodate several households and with the growing numbers of homesteads allocated through a 'permission to occupy' (PTO) there is increasing pressure on the environment. The customary concept of land held for past and future generations is rapidly being eroded by modernist concepts of land as a commodity and a cash economy.

Environmental stressors originate from several sources. Uncontrolled development in environmentally sensitive areas is taking place and high quality agricultural land is being used for homesteads in an ad hoc manner. The attempts of the TL to improve livelihoods through allocation of homesteads may now be having the opposite effect as ecosystem services are strained and the land cannot support all the activities on it.

Furthermore, the unconstrained, random allocation of land thwarts planning by the municipality and the provision of social services such as schools and hospitals. Poor communication between the TL, Ingonyama Trust and the municipality is a problem. There is limited participation in formal IDP and spatial planning processes, while the municipality is unable to regulate land uses in areas under traditional authority.

4.3 Nkomazi, Mpumalanga Province

This area lies just to the south of the Kruger National Park and borders on Swaziland and Mozambique to the east. Malelane is one of the largest towns in this largely rural area, where the institution of TL is held in high esteem. One critical role of the institution is that of conflict resolution with "lasting and amicable" outcomes (Mchunu 2015:48), while another is preserving traditional values and culture.

Despite widespread recognition of TL as an important local institution, there were reservations regarding their role in spatial governance. One concern relates to the random allocation of sites, making it difficult for the municipality to provide services. Another pertained to the lack of transparency or accountability, particularly around the use of the income generated through fees payable for the allocation of a site ('khonza' or 'lotsha' fees) (Nkosi, 2015), or the alienation of communal land to developers. The random allocation of sites also has detrimental consequences, such as allocation of sites on land reserved for pipelines or roads, necessitating the demolition and relocation of the homesteads. A positive role of the TL was the allocation of land for small enterprises that could not afford to locate in urban areas where land rents are much higher, yet this too could have negative consequences as there is effectively no regulation of activities after the allocation of the site.

There was agreement that collaborative decision-making around spatial planning and governance is essential, a process that should involve TL and the municipality. However, officials were of the opinion that the municipality should lead the process to ensure that services could be economically provided to all sites. Furthermore, though collaborative planning, more effective use of the land with smaller sites , could accommodate more people. Importantly, land allocation should go hand in hand with land use management. Given that the legislation (SPLUMA) defines this as a municipal responsibility, it is essential that the TL and municipality work closely together in identifying land for development, sites (plots) to be assigned to new households and the allocation of land uses/ rights. However, the TL believe that the allocation of land use rights is intrinsic to the allocation of land and thus their responsibility, but were willing to do this cooperatively with the municipality.

Although the respondents agreed that some form of spatial governance was needed, there was no consensus on the nature and extent thereof. A single set of regulations for the entire municipal area was seen as desirable as long as the uniqueness of rural areas was respected. Also, a balance between flexibility and rigour of the regulation was required.

4.4 The traditional Xhosa cultural zone of rural Eastern Cape

This case study considered the implications of a single (modernist) spatial governance system for a province where deeply rooted suspicions around any planning activity conducted by government exist. Spatial planning and governance in the Eastern Cape has largely followed a western model that is foreign to the customary values and culture of the Xhosa and largely ignored the growing recognition of cultural rights and the value of indigenous knowledge. As a consequence, the TL have rejected SPLUMA. This is partially due to the lack of participation in the process of formulating the act, and partially as the responsibility for land governance is vested in municipalities while TL are marginalised in the process. Effectively, it is viewed as "the separation of land and land use from Xhosa identity" (Williams, 2015: 4).

The poor communication and lack of trust is seriously hampering efforts to promote development and threatens the sustainability of sensitive areas such as the Wild Coast region. Consequently, past injustices, current marginalisation of TL and culturally insensitive planning are obstructing efforts to improve the lives of one of the most impoverished areas in South Africa.

4.5 Mpumalanga Province

This case study identifies critical issues from a survey undertaken by the Department of Rural Development and Land Reform in Mpumalanga. TL from 58 of the 60 Traditional Councils as well as representatives from the nine local municipalities hosting traditional councils in the province participated in the interviews, with a total of 67 respondents.

The responses by municipalities indicate a number of issues around spatial governance including land invasions led by TL, random allocation of sites that

hampers service delivery and limited enforcement of land use or development regulations in rural areas. The TL also voiced their concerns, such as a lack of meaningful consultation throughout the development process from planning to implementation, unlawful occupation of land and limited assistance in spatial governance issues by government and local authorities who lack adequate capacity to undertake their own functions. The TL believe that they have the indigenous knowledge and community support to manage their areas, provided that they have support from government.

Many of the problems mentioned by TL and municipalities could be resolved, or at least mitigated through improved communication and "authentic dialogue" (Innes and Booher, 2010: 97). The TL are willing to work with government (including municipalities) on spatial governance issues, provided that the latter have an open agenda and do not usurp their powers concerning land allocation. Moreover, including the TL within ward committees would strengthen the relationship and communication flows (Nkosi, 2016).

5. DISCUSSION

Several recurring themes emerge from the case studies: the continued respect of the institution of TL and the need to respect cultural diversity, the unsustainability of current development patterns, the lack of effective spatial governance by local government and the need for collaborative governance. These themes are clearly interrelated, influencing one another.

Traditional leadership, including the culture and values that it represents, has survived both colonialism and apartheid, and notwithstanding the current government's emphasis on elected municipal councils over TL, it remains relevant to many South Africans. For this reason alone, there is a need to respect the institution as a role-player in the spatial governance of rural areas. Additionally, the United Nations International Covenant on Economic, Social and Cultural Rights promotes respect for indigenous and cultural rights. Planners can therefore not dismiss traditional cultures, but must take them into account in planning. Besides the acknowledgement of diversity of culture, acceptance of diversity of values is essential in a country of multiple cultures, customs, faiths and perspectives. Where previously planning was authoritarian, using its power to command and control actions and the implementation of plans (Healey 2004:51), it is imperative that planners now include communities and their ways of viewing the world as part of the planning process.

For Innes and Booher (2010) such inclusion entails both respect for lay (or indigenous) knowledge, and collaborative planning that constitutes a partnership between communities, their leaders and the government. Hence, TL must be part of the IDP planning process from the outset, not a rubber stamp on a finalised plan and budget. Genuine participation, not tokenism (Arnstein, 1969) is required along with transparency from all parties. Participation in ward committees or regular meetings between councillors and TL may be a first step towards improved spatial governance.

Whereas customary ways of allocating sites and managing land may have been entirely appropriate under circumstances of low population and densities, the present pressure on the land is no longer sustainable. The nature of spatial governance in rural areas must adapt. Indigenous knowledge and modern ways of knowing need to be merged to manage the current reality of degraded land within the former Bantustans (Hoffman, 2014). Furthermore, the random siting of homesteads makes it difficult to meet the development goal of safe water provision to all households; thus, different processes are required.

Spatial planning can play a critical role in preparing a land development plan that identifies suitable areas for homesteads, social services and economic activities as well as enabling the provision of basic engineering services. However, this must be done in collaboration with the community to ensure that there is consensus on the proposals so that they are understood and adhered to. Where the Ingonyama Trust is a stakeholder in development it too must also be a partner in preparing and approving the plan.

Besides agreement on a development plan, a mutually agreed process to manage land applications for both residential and non-residential purposes must to be formulated that clearly articulates the roles of each party in the process. These could be incorporated into the municipal spatial planning and land use management bylaws to ensure commitment and continuity between municipal administrations. Additionally, agreement between the municipality and the TC on how to enforce the jointly agreed land development plan is essential to prevent building within flood-lines or land designated for services. The agreement should again explicitly state the rights and obligations of the various parties. Here much can be learned from

the research around CPR management institutions. Adaptive governance that incorporates old and new knowledge, along with "processes that generate learning, meaning, knowledge and experience" (Folke et al, 2005: 445) will create social capacity to deal with the challenge of change. Recognition of TL and accountability of all governance structures is essential to improve effectiveness, participation and legitimacy of such structures

6. CONCLUSIONS

Spatial governance within areas under TL reveals a clash of worldviews, cultures and power. Traditional cultural perspectives around land differ from modernist views of land as a tradable commodity. The relevance and legitimacy of the institution of traditional leadership within a western style democracy is being questioned, while the legislation – notwithstanding the recognition of TL in the Constitution – appears to favour municipal councillors over TL. The consequences of the uncertainty around TL, combined with the continued respect of communities for this institution are three uncoordinated systems of land governance and unsustainable development patterns.

The resolution of this conundrum lies collaborative, adaptive governance and the principles that underlie such adaptive co-management. The first principle is the acceptance of diverse views, perspectives, customs and traditions – the appreciation of difference and the learning it can bring. The second principle relates to the right of all members of a community to be heard and engaged in the governance process, i.e. participative planning and democratic governance processes.

Improved spatial governance requires collaboration, where the TL and municipality are equal partners with clearly defined responsibilities, obligations, accountability and authority. It also demands commitment to this process and a willingness to learn from each other. There are lessons that can be learned from CPR management and the adaptive co-management of ecosystems. Ideas and principles can be tested in TC areas. Flexibility, openness to difference and the capacity to deal with change is essential. Mutual respect lies at the heart of a sustainable governance system in traditional areas.

Together these partners can undertake spatial governance processes such as land development planning and regulating change, mutual learning, adapting the plans and processes and jointly realising greater sustainability of the area and improved livelihoods for the community. Simultaneously, the local heritage and culture – as reflected in the landscape – can be preserved.

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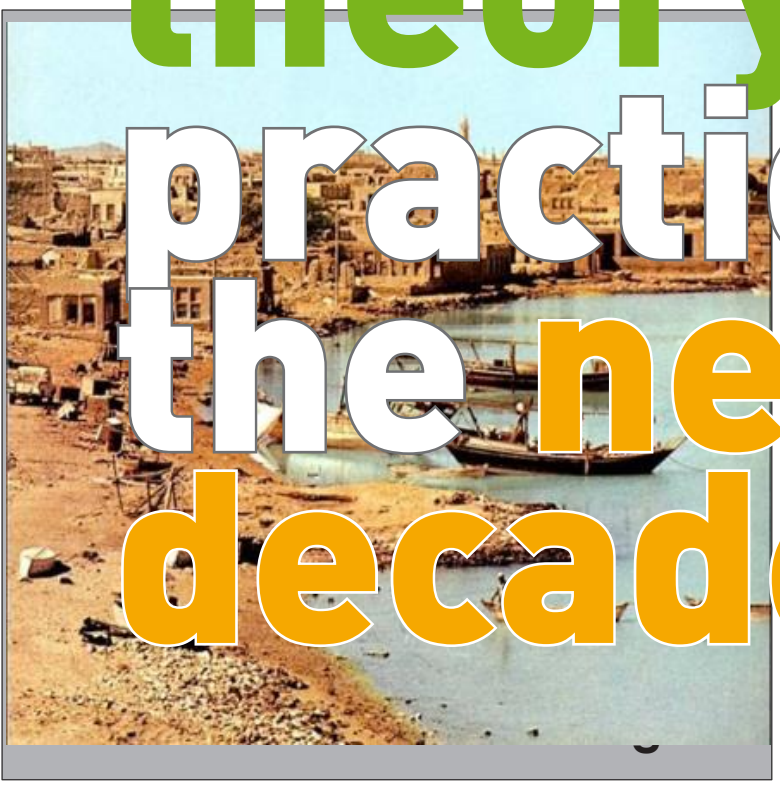
"CITIES WE HAVE VS. CITIES WE NEED"

Track III

Envisaging planning theory and practice for the next decades



Final Report

by Milena Ivkovic (Netherlands/Serbia), Nuin-Tara Key (USA) & Mark Oranje (South Africa)

1. MANAGING INNOVATION AND CHANGE

At the very beginning of the subtrack "Managing Innovation and Change", a paper titled "The capacity of institutional innovations for planning practice – reinventing application"[1] looked deep into theories on how planning institutions can and should change in order to be more innovative. Starting with a theoretical Western perspective on change, the paper jumps to a case-study territory of the city of Kigali, the capital of Rwanda. In the African context where local planning traditions are so different from the Western ones, planning institutions have the chance to make a frog leap and adopt directly the innovative practices, without having to go through the institutional and implementation pitfalls.

A similar point of view was expressed in the paper "Tackling urban challenges in sub-Saharan Africa through indicator-based sustainability assessment"[2] which used the city of Lilongwe in Malawi as a case study. The point addressed here was that in a weak institutional planning system (characteristic for many African countries) it is better to use framework-planning approach instead of typical Western masterplanning approach. In this process, the use of technology is essential in making choices and providing the right spatial solutions. Moving from rigid, traditional planning theories (which are suited for a strong institutional system typical for the developed countries, and almost non-existent in the larger African context) to soft methodologies is probably the best step forward.

The need to take a different theoretical viewpoint when it comes to non-Western context was indirectly expressed in the paper "Through a rhizomatic process of planning"[3]. Planning in the context of loose or weak institutional power has to take a new attitude towards the future in general, and put less pressure on rigidly structuring the space.

The visible trend in the several papers of the Track was the focus on the neighbourhood planning, and better understanding of the everyday users of the many urban systems. Placed in the context of the Italian city of Milan, the paper "Heterotopia and equilibrium of contest urban space-an investigation of an accommodation assimilation mechanism"[4] re-examines the theory of heterotopia to explain indirect rules that seem to govern the actual organization of public space in the city's Chinatown neighbourhood.

The plea for better understanding the users' and their way of understanding the urban space is also present in the paper "In search for new urban planning education and research formulas"[5]. The author stresses the importance of teaching the new generation of planners how to deal with actual urban challenges, through co-creation with the users and in a neighbourhood "living lab" setting. This approach is important for the (South) African context, because it gives a strong social dimension of the planning, instead of merely the functional one.

The appreciation of the culture and individual lifestyle as a driving force of urban transformation can also have its dark sides, as the paper "Mis-Romanticism of hidden spaces and gentrification"[6] points out. Although many urban planners recognize the social downside of the so-called gentrification process, it is also important for them to understand the economical arguments of the process. In the vulnerable context of many African cities where commercial urbanization threatens to sharpen the social division, it is almost an imperative to try and find the models that can integrate the social and the commercial in a sustainable way.

2. ENVIRONMENTAL PLANNING

The dichotomy between social and commercial sides of urban planning is most palpable in the domain of environmental planning. We have seen how the integrated approaches in environmental planning and landscape design can both benefit the environment and the communities, (paper "Using the natural ecosystem to achieve urban societal ambitions"[7]) but the prerogative is that a proper legal framework has been set up. This can be quite a challenge for the African countries, considering that this is also

1 by Carolin Pätsch
2 by Tjark Gall
3 by Torres Nilton
4 by Zhu Jingyi
5 by Hanna Obracht-Prondzynska
6 by Jacob Kalmakoff
7 by Lena Niel

a big and difficult to solve issue in the Western countries as well.

A lesson from the South African context in the paper "Planning for Sustainable Communities is Planning for Green Spaces"[8] pointed out that even some of the best and most widely accepted theoretical models (in this case of public spaces) sometimes just don't deliver the expected results in the particular local context, and that planners should keep looking for custom-made solutions. The need to find the right solutions for the right locations is also evident in the "Evaluating the implementation performance of historical and cultural town planning:case of Guangfu Town"[9] paper which strives to define a good, independent evaluation system of the implementation of the plans. Finally, in the example of "Sustainability and the Revolution in Urban Planning"[10] we see that the search for better understanding of the multi-layered complexity of urban planning can sometimes be found in the simple schemes, which can help learn from the past and face the future challenges in every planning context.

3. POST-COLONIAL PLANNING

A diverse set of papers focused on the challenging space of post-colonial planning. While these papers addressed a broad range of issues, including housing and human settlement, rural service delivery[11], and the dynamic characteristics of informality[12], a cross-cutting and consistent theme emerged: the need to support and develop localized knowledge and capacity. In a planning theory and practice context, many of the authors brought up the critical role that meaningful and culturally relevant engagement plays in building and sustaining the capacity to overcome the myriad challenges of post-colonial planning. While research in this area is still critically needed, there are opportunities and examples to look to. For example, in Ghana the outdated colonial master planning system, which is "rigid, non-participatory and unresponsive" to modern urban development challenges, is undergoing a reform process.[13] Part of this reform focuses on building participation and inclusiveness as a central component of spatial planning in an effort to overcome the cultural dissonance between colonial systems and local contexts. The term often referred to in these papers is the "African Renaissance" – a new, broad societal, cultural and economic movement based on embracing and re-discovering African value systems and African identity. In the South African context, the principle of an African Renaissance, further supports the need for building local capacity and meaningful engagement. For example, "'Normal' Informal Living Spaces in Low-Income Human Settlements in South Africa" argues that Western-style planning approaches to standardized housing has disrupted the traditional South-African way of living, and that embracing and understanding informality can be a better approach to the needs of people actually living in informal settlements. Embracing local informality requires engaging with local communities in all stages of the planning process and meaningfully bringing local aspirations and values into the mechanisms of spatial planning. While there was general consensus around this theme, there was also an outstanding question on how to do this. It is clear that additional research is needed to answer the question of how to transform our governance structures to ensure that engagement not only brings people to the table, but also ensures that planning can be a conduit to addressing power differentials, local and cultural norms, and community-driven aspirations, without which, we will not achieve the cities we need.

4. TOOLS FOR INTEGRATED PLANNING

Given the complexity of challenges that face cities and urban areas in the 21st Century, a considerable number of papers presented in Track 3 focused on the idea of "integrated" planning. While this concept was applied to the intersection of a diverse set of issues - from ecological sustainability and urban form[14], urban regeneration and spatial planning[15], and integrated spatial planning across scales[16] to name a few - a common theme emerged: integration between sectors and across scales is a necessity to achieving the cities that we need. This idea of "integrated planning" is rooted in the idea that changing urban form alone will not solve our current and future social, economic and environmental challenges. Given the need to develop complex responses to complex challenges, many authors in this sub-track explored numerous "tools" to guide more integrated planning approaches. In the South African context, much attention was spent on governance and policy tools, specifically SPLUMA. While there was consensus on the need for integration and a general recognition that SPLUMA provides a new regulatory context for this transition, there is still a need to develop functional tools to ensure that this "integration" is achieved in

8 by Goosen Zhan
9 by Zhang Xiao
10 by E. Stephen Goldie
11 by Umar Jimoh
12 by Claudia Loggia
13 by Eden Tekpor Gbeckor–Kove
14 by Tessa Joubert
15 by Solanki Gosh
16 by Jessica Page

the day-to-day of planning in South Africa. Similar to the other topics explored in Track 3, this sub-track highlighted critical additional research areas that require more attention if we are to see success in achieving the cities we need. In the context of integrated planning - the outstanding research question remains: how do we make integration between fields and sectors happen in the day-to-day context of rapid urbanization?

While track 3, "Envisaging Planning Theory and Practise for the Next Decades" provided a broad diversity of topics, theories, and cultural practices, there was unified consensus around three significant planning challenges for the coming decades. First, managing the pace of change in the urban context is tremendously challenging in a planning context, given the mismatch in the amount of time needed to design, develop and implement long-term planning solutions. Second, not only is the pace of change accelerating, the type of development and socio-economic changes are becoming increasingly dynamic and complex; this is especially true in the context of environmental planning. Third, the historic approach of planning as a top-down and "technocratic" process is reaching its limits and needs to transition to a more participatory and flexible process.

While these three themes represent significant and difficult challenges for the decades ahead, there was general consensus on solutions - providing a hopeful path forward. First, planning theory is evolving to provide a more elastic framework that accommodates rapid change while providing actionable and measurable guides that achieve local aspirations. Second, planning theory and practice is transitioning to a more cross-sectoral approach that better integrates diverse fields and perspectives. Third, planning theory is better recognizing the need to link planning practice to governance processes and systems. This is especially apparent in the growing focus on meaningful public engagement and policy making.

While there was general agreement on the solutions outlined above and the direction planning must take in the coming decades, the outstanding question remains: How do we consistently implement these solutions? IT is time to turn our attention to functional implementation and rapid knowledge exchange between practitioners and communities, if we are to achieve the cities we need.

Tackling urban challenges in Sub-Saharan Africa through indicator-based sustainability assessment

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This paper examines the scientific background and practical possibilities of indicator-based sustainability assessment in urban sub-Saharan Africa. The proposed method acts as a platform for site and project selections as well as an evaluation tool for existing approaches of different stakeholders. For the purpose of this paper the method examined will be applied in the context of Malawi.

1. INTRODUCTION

Fifty percent of the global population currently resides in cities. By 2050 it is expected that more than two-thirds will live in urban settlements. This growth will mostly occur in African countries. Today approximately one billion people live in Africa and it is anticipated to grow to more than four billion people by the end of the century, to make up more than one-third of the world's population. The United Nations expect twenty-eight (28) African countries to double their population by 2100 and ten (10) countries including Malawi, are expected to quintuple (United Nations 2015).

The rapid growth of the global urban population has steadily increased the importance of sustainability in urban planning. Many assessment methods and indices created for this purpose, use indicator systems to evaluate the sustainability of urban development and thus generate spatial and temporal comparisons. To date, most models have been created to describe existing city patterns and fabrics. An indicator-based approach on sustainable growth could further be used to evaluate urban development concepts prior to its implementation and make data-based changes accordingly. The main focus of this paper will be centered on these opportunities and their feasibility.

This paper includes a thorough analysis of existing approaches as well as the suggestion of a preliminary assessment framework. The paper starts with an overview of the theory and methods currently in use, providing a background to understand the proposed framework as well as the applied ways of selecting and aggregating indicators.

The paper aims to contribute to the discussion 'Envisaging Planning Theory and Practice for the next decades' by assessing social-spatial relations in existing settlements and proposing possible improvements through planned developments. Further, the indicator-based assessment the underlying basis for 'Urban Framework', a main project of our NGO, which aims to automatize several aspects of urban planning due to its rising complexity. This approach allows for new: data based and informed decisions, planning approaches, adaptable case-studies, generations of possible future developments while ensuring a sustainable, human-scale progress of urban agglomerations in sub-Saharan Africa.

2. BACKGROUND

2.1 Theory of sustainability

The paper is based on the theory of sustainability from the World Commission on Environmental Development, founded by the United Nations for the purpose of a better understanding of long-term sustainable development. The commission stated in its report "Our Common Future" the following explanation, which is even if not precise, unchanged in use until today and underlies all recent approaches for the sustainability assessment:

'Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987).

While the sustainability aspect was initially applied only to the environmental dimension, it was extended over the years by Elkington to the Triple-Bottom-Line, including the economic and social dimension (Elkington 1998). Later the Quadruple-bottom-line was introduced by Teriman adding governance through its major contribution on every scale of sustainable development (Teriman et al. 2009).

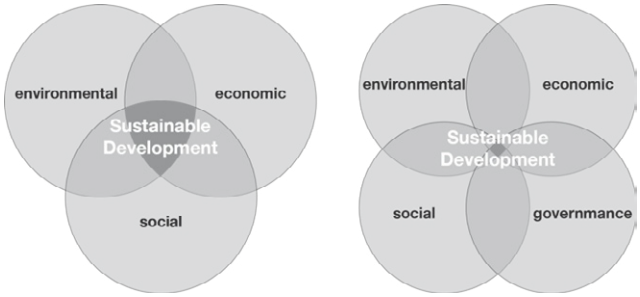


Figure 1: Left – Triple-Bottom-Line based on Elkington (1998); right – Quadruple-Bottom-Line based on Teriman (2009)

The latter is nowadays mostly used and underlies this paper as well, even if the dimensions are not divided or as strict anymore to avoid the occurrence of problems with multi-dimension indicators, which will be discussed later in this paper.

2.2 Assessing urban life-quality

The leading prospect of the developed assessment system focuses on tackling urban challenges. These challenges ultimately start with the human populations living in urban agglomerations. The biggest impact urban planning can have on these populations is on a spatial scale. Regardless if it's through infrastructural projects or small-scale interventions they all affect the overall urban fabric in an acupunctural manner. Therefore, the primary goal is to assess Urban Life-Quality to measure the consequences that planning initiatives and/or projects can have on people's wellbeing. But assessing the wellbeing or social aspects in general, is always a challenge in itself. In the past, the Gross-Domestic-Product (GDP) was mostly used as an assessment indicator, but as pointed out by Richard Easterlin in the so-called 'Easterlin-Paradox', even if a growth of the personal income affects the life-quality of the individual, it has no effect on the general well-being of the country's inhabitants, which is even more relevant in sub-Saharan countries, where the gap between the poor and rich is much higher than in Western countries. The OECD (Organization for Economic Co-operation and Development) published the highly acknowledged paper 'How's life? Measuring well-being?' in 2011, covering most measurable aspects of the quality of life and is one of the primary sources for social indicators (OECD 2015). Additionally, Maslow's hierarchy of needs is still a relevant tool to prioritize the different aspects and therefore acts as a base to organize the aggregation of the individual indicators, and further shows both the importance and influence of the urban fabric on the individual's life. The following figure is adapted to the studied field of social-spatial relations of urban development (Maslow 1943).

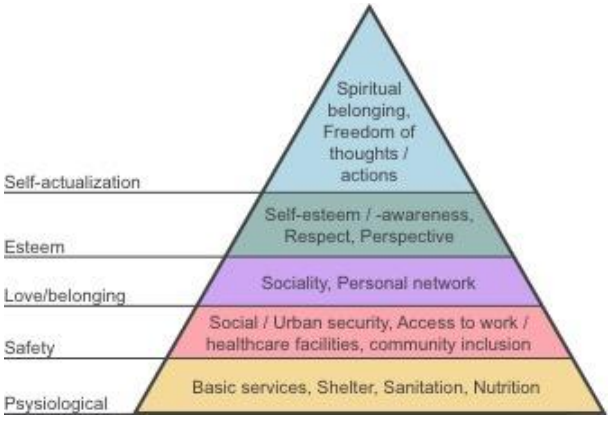
2.3 Assessment frameworks

The developed assessment framework is based on several existing approaches and studies completed over the past 17 years. The 17 Sustainably Development Goals published by the General Committee of the United Nations, provide the aspired goals. The following six goals are directly connected to the proposed framework while the remaining 11 can be archived indirectly.

- Goal 3. Ensure healthy lives and promote well-being for all at all ages
- Goal 6. Ensure availability and sustainable management of water and sanitation for all
- Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all
- Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
- Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable (UN 2015)

Further, the various findings of UN-Habitat combine sustainable development with the field of Urban Planning and Design and name the three main aspects of (1) Gender/Youth/Human Rights/Climate Change, (2) Housing & Slum Upgrading, and (3) Urban Basic Services. Additional to the main driver of Urban Planning and Design, Urban Finance and Urban Legislation are two secondary involved fields

Figure 2: Maslow's hierarchy of needs, adapted to urban context (Maslow 1943; Gall 2016)



and are important for sustainable development (UN Habitat 2015).

The BEQUEST Framework, developed in 2005 by Curwell provides a good overview of all themes and sub-themes of Urban Sustainability Assessment. It divides the sector in Development, Environmental & Societal Issues, the spatial level, and the time scale. The development activity is further divided into planning, property development, design, construction, and operation. The Environmental and Societal Issues use a slightly adapted version of the Quadruple-Bottom-Line sustainability dimensions (which will be discussed more in detail on the next page). The spatial level spreads from the global to material level, while the time scale uses three different time-frames, starting at short-term outcomes of less than five years up to the long-term development of more than 20 years (Curwell et al. 2006, pp. 15–32). The sustainability dimensions as well as the time scale, is used in the same way, while the development activities and the spatial levels are adapted to a more specific assessment method. In 2014, the International Standardization Organization (ISO), aimed the first time to develop a standardized indicator set which could be used across every scale and context. The 17 proposed schematic themes of the ISO 37120 (Economy, Education, Energy, Environment, Recreation, Shelter, Solid waste, Telecommunications and innovation, Finance, Fire and emergency response, Governance, Health, Transportation, Urban Planning, Wastewater, and Water and Sanitation) provide another set of useful themes, which are integrated into the proposed framework (ISO 2014).

Lastly, the background theory of the application and evaluation of development initiatives is based on the approach of searching instead of planning from William Easterly, explained in his widely known publication of the development fields 'The White Man's Burden'. Additional to its various coverage of different scale aid projects, it concludes in the assumption, that large- scale planning rarely can fulfil its expectations and small-scale (grassroots) projects, combined into the term 'Searching' has a much better input-result-ratio. Further, he points out, that international organizations prefer to take action in areas, which sound better on paper. An example therefor is the preference of treating people's diseases instead of attempts to avoid the outbreaks in the beginning (Easterly 2007). Despite the influence on my personal decision, to reset my focus on the work more on the field instead of only staying in the research area, it lists endless well supported examples as to why a critical assessment of existing or planned projects in the development and aid sector, is fundamental in achieving better long-term effects. Therefore, it's crucial to evaluate projects before, during and after their execution on their actual results in comparison to the financial input and other resources spent.

2.4 Dimensions and themes

As introduced in the Theory of Sustainability, the Quadruple-bottom-line divides sustainability into four dimensions or pillars. Even if they are still used in many contexts, it is not advisable anymore to differ between them due to the fact that many indicators affect several dimensions and therefore cause problems if only assigned to one. The United Nations introduced themes as a replacement for the pillars to cover cross-cutting issues and emphasize the multidimensional nature of sustainable development (United Nations 2007, p.10). In the proposed framework the dimensions remain but are detailed through the use of sub-themes and impacts as a way of better assessing particular fields and aspects of sustainable development.

2.5 Impacts

Indicator-based assessment always aims to study the impacts of a particular development field and compare it either spatially or temporally. Therefore, the developed framework must allow the prioritization of several aspects and needs to be adaptable to several effects. The impacts studied include amongst others the different dimensions of sustainability i.e. more specific issues like health care or infrastructural consequences on the social well-being of a planned development.

2.6 Scalability

Urban sustainability assessment of one urban agglomeration can be mainly executed on four different scales. The largest is city-wide, where districts (4 in Lilongwe) or areas (62 in Lilongwe) can be compared, otherwise a grid of 1 km x 1 km (depending on the examined topic) is applied to the whole city and therefore creates a grid as a comparison tool. The next scale is the district level, which again allows the comparison of areas; or the application of a grid of 1 km x 1 km or smaller. The second last scale is an area, which allows the comparison through either the included neighbourhoods or a grid of 100 m x 100 m. The neighbourhood scale is the most detailed, which can compare (if applicable) the existing blocks or even go down to the individual households level depending on data availability. The scale must always be chosen depending on the studied topic; for a general analysis of larger infrastructure

development, a city-wide scale should be selected, whereas a project site in an informal settlement can be determined through the comparison of individual blocks or households in the selected area.

2.7 Distinction of indicator-types

Based on the model of the Global City Indicator Facility indicators are divided into profile and performance indicators. The first mentioned are necessary for a general classification but are not considered in the grading/evaluation process, whereas performance indicators describe the performance of the examined area and thereby the impacts on the sustainability (GCIF 2011). Indicators can then be distinguished in core and secondary indicators. The core indicators give comprehensive information about the area and can be used regardless of the intended impact or chosen scale and dimension. Secondary indicators are additional indicator-sets, which allow the addition of more accurate information based on the studied field of sustainability (OECD 2015, p.21).

2.8 Aggregation

Aggregation is a necessary weighting procedure to combine various indicator values to a grouped result. It always needs to be adapted regarding the importance and reliability of the used data and the sought outcomes. The grouped indicator scores result in a composite index score. Three aggregation methods are normally used, regarding the grouped data and its specifications: summing up (linear aggregation), multiplying (geometric aggregation) or non-linear techniques (multi-criteria analysis) (Yigitcanlar & Dizdaroglu 2015, p.182). There are two different kinds of aggregation that depend on the analysed impact: the content-based and spatial aggregation. A spatial aggregation can be executed on different scales, while a content-based aggregation always concentrates on one or several subject themes (Grunwald & Kopfmueller 2006, p. 61).

2.9 Data types and availability

For a fully functional indicator-based assessment extensive datasets are essential, which in sub-Saharan Africa is even a bigger challenge than in Western regions. Therefore, it's important to choose the indicator set according to the data availability and adapt the aggregation to ensure missing information does not affect the results to a negative extent. Further, it can be differentiated between quantitative, semi-quantitative, and qualitative data. Quantitative data is mostly the central element of indicator systems and can always be shown in exact numbers. Examples are the population or the density. Questions for semi-quantitative data can always be answered with yes or no. Examples for this are the general availability or access to electricity or public transport. Qualitative data is the most challenging because it can neither be shown in numbers nor as yes or no information. The results are described in words and can therefore just be used for the general assessment if they are simplified and aggregated. Furthermore, data can be distinguished in subjective and objective, whereas objective indicators are using information, which is gathered by organizations or official institutions and rely exclusively on measurable data. Subjective information is collected from a group of people which are providing their personal perspective on something, exemplary their content with a particular context. Even if this part seems to be quite theoretical, it is crucial for understanding the full sustainability assessment including the weighting of different indicators.

3. DEVELOPED METHODS AND RESULTS

3.1 Possibilities of application

There are various ways the developed assessment framework can be used in the urban planning field. However, I am concentrating one the two major area which it can be applied to. Several real projects and initiatives and therefore are detailed in the following pages:

- The assessment of the existing urban setting and the possibility of locating projects in areas which can archive the best results
- Assessment of development initiatives and their ability to archive the sought goals, as well as results and sustainability of the work from several local and international NGOs and governmental initiatives

3.2 Proposed assessment framework

Based on the previously explained theory of sustainability and the main principles of indicator-based assessment of urban development, the following framework was developed. It is divided into nine categories, starting with the general theme/dimension of the assessed field. The second column shows the sub-themes, mostly based on the ISO 37120. The third column shows the approach or method, through which the impacts/goals of the following column are tried to be archived. The impact is the major category for the aggregation because every sustainability assessment should start with the aimed impact. The next two columns situate the indicators in a spatial and time level, while the last

three provide more information about the type of the indicator and used data. Each indicator can be assigned to one or several of the first six categories, while the last three require (with few exceptions) an absolute assignment.

3.3 Indicator sets

21 indicator frameworks and sets:

- Bossel (1999) : Indicators of sustainable development for different scales
- Hasan (1999) : List of key indicators
- Keirstead (2007) : UES indicators for London
- United Nations (2007) : CSD Indicators of Sustainable Development
- European Commission (2009) : EUROSTAT sustainable development indicators
- Salman & Qureshi (2009) : Selected indicators of urban regeneration
- UN-Habitat (2009) : Habitat Agenda Indicators
- Purevee (2010) : Sustainability assessment of Darkhan
- Yigitcanlar & Dur (2010) : Indicator System of the SILENT Model
- Alpopi et al. (2011) : Indicators for assessment of status of Romania
- Global City Indicator Facility (2011) : GCIF Profile Indicators
- Global City Indicator Facility (2011) : GCIF Performance Indicators
- Shen et al. (2011) : Compliance of practices with IUSIL
- Joburg (2011) : Proposed indicators for four outcomes
- Lynch et al. (2011) : Existing Indicator Database
- Lynch et al. (2011) : Sustainable Urban Development Indicator Matrix
- OECD (2015) : Indicators for measuring well-being
- CAPE PRC (2014) : Selected Urban Development Indicators, 1990–2013
- Saberifar & Falahat (2014) : Compact City Indicators
- UNEP (2014) : Core indicators
- Musakwa et al. (2015) : Indicators based on GIS / EO data

A total number of 1028 indicators were collected, some are similar and can be combined, while others cannot be applied to the context of sub-Saharan Africa. However, it still results in more than 500 indicators covering almost every measurable field of urban development that can be described by indicators. Each of these can be assigned to one or more fields of the developed framework. Following are four examples of various sets. The fourth indicator only shows one exception, that some basic profile indicators are assigned to each category because of the general need for grading and aggregation based on, in this case, the density.

Theme / Dimension	Sub-theme	Approach / Method	Impacts / Goals	Spatial Level	Time Scale	Indicator	Data-Source	Data-Type
Environmental	Local Economy	Urban Planning	Healthy lives and well-being	City	long-term > 20 years	Core Profile	Objective	Quantitative
	Education		availability and sustainable management of water and sanitation					
	Energy	Urban Design	access to affordable, reliable, sustainable and modern energy					
	Environment							
Economic	Recreation	Urban Finance	sustained, inclusive economic growth, productive employment and decent work	District		Core Performance		Semi-Quantitative
	Shelter							
	Solid waste	Urban Legislation	resilient infrastructure, inclusive, sustainable industrialization, and innovation					
	Telecommunications and innovation							
	Finance	Education / Training	inclusive, safe, resilient and sustainable cities and human settlements		medium-term 5-20 years			
Social	Fire and emergency response							
	Local Governance	Land Tenure	Gender / Youth / Human Rights	Area		Secondary Profile	Subjective	
	Health		Climate Change					
	Transportation	Property Development						
Institutional / Governmental	(Infrastructural) Urban planning		Housing & Slum Upgrading		short-term < 5 years			Qualitative
	Wastewater	Construction	Urban Basic Services	Neighbourhood		Secondary Performance		
	Water and sanitation	Operation	...					
	...							

Figure 3: Assessment framework based on several references and adapted to specific context (Gall 2016)

Theme / Dimension	Economic | Social
Sub-theme	Transportation | Infrastructural Urban Planning
Approach / Method	Urban Planning | Operation
Impacts / Goals	Sustained, inclusive economic growth, productive employment and decent work | Resilient infrastructure, inclusive, sustainable industrialization, and innovation | Urban Basic Services
Spatial Level	City
Time Scale	Long-term | Medium-term | Short-term
Indicator-Type	Primary-Performance | Secondary-Performance
Data-Source	Objective
Data-Type	Quantitative

Theme / Dimension	Social
Sub-theme	Recreation | Shelter | Health | …
Approach / Method	all approaches / methods
Impacts / Goals	Healthy lives and well-being | Gender / Youth / Human Rights
Spatial Level	City | District | Area | Neighbourhood
Time Scale	Short-term
Indicator-Type	Primary Performance | Secondary Performance
Data-Source	Subjective
Data-Type	Qualitative

Theme / Dimension	Environmental | Social
Sub-theme	Environment | Recreation | Health
Approach / Method	Urban Planning | Construction | Operation
Impacts / Goals	Healthy lives and well-being
Spatial Level	City | District | Area | Neighbourhood
Time Scale	Short-term
Indicator-Type	Primary-Performance | Secondary-Performance
Data-Source	Subjective
Data-Type	Quantitative

Theme / Dimension	all themes / dimensions (primary profile indicators are in general important for each category)
Sub-theme	all sub-themes
Approach / Method	all approaches / methods
Impacts / Goals	all impacts / goals
Spatial Level	all spatial level
Time Scale	all time scales
Indicator-Type	Primary Profile
Data-Source	Objective
Data-Type	Quantitative

Figure 4. Indicator 1: Cost of the longest transit trip (Lynch et al. 2011)
Figure 5. Indicator 2: Quality of life (Keirstead 2007)
Figure 6. Indicator 3: Number of noise complaints (Salam & Qureshi 2009)
Figure 7. Indicator 4: Number of inhabitants per km2 (Shen et al. 2011)

However, there is a need for secondary performance indicators of the financial and resource field, which can be used to compare the improvement of the urban fabric to the invested resources. The most important indicators would be:

- financial resources invested (project cost, running costs, ...)
- human resources (local / international)
- total time spend
- assurance of lasting and scaling effect on involved stakeholders
- installation of evaluation methods
- development of long-term controlling methods

4. SCENARIOS FOR APPLICATION

In the last part, I discuss two possible ways of applications of indicator-based sustainability assessment. The first is for locating the site with best results and consequences on the surrounding urban fabric, while the second functions as an evaluation and grading system of planned and completed projects. Both scenarios start with the selection of several fields in the framework which best cover the aspired outcomes. These selections result in an indicator set and an automated assessment process adapted to the available information. Due to the extent of this paper, one is described shortly, while the second is covered more in detail including sample indicators.

4.1 Scenario 1: Evaluation of project after completion / 1 year / 5 years / ...

A donor organization wants to evaluate its recently financed projects in the urban development field to improve their investment-outcome-ratio. Their objectives are the decrease of negative environmental effects and the increase of electricity and water supply. The methods of funded projects concentrated on education/training and construction and aims for the availability and sustainable management of water and sanitation, as well as the access to affordable, reliable, sustainable and modern energy. The spatial level is the whole city, while their projects are based on medium-term development. Due to the fact that they want to involve the subjective opinions of the city's inhabitants, all kinds of data are included. This particular scenario would result in the following framework:

4.2 Scenario 2: organization / company searching for best location / topic for project

An NGO wants to start a project in the largest informal settlement of Lilongwe, Malawi. The main ambition is to tackle the social dimension, in particular, the shelter issue. Their aim is to reach an improvement through Urban Design and Education/Training and aim for Housing and Slum upgrading. Due to the challenge of data availability, they concentrate only on objective data to avoid negative effects on the concluding spatial grading. These decisions result in the following adapted framework.

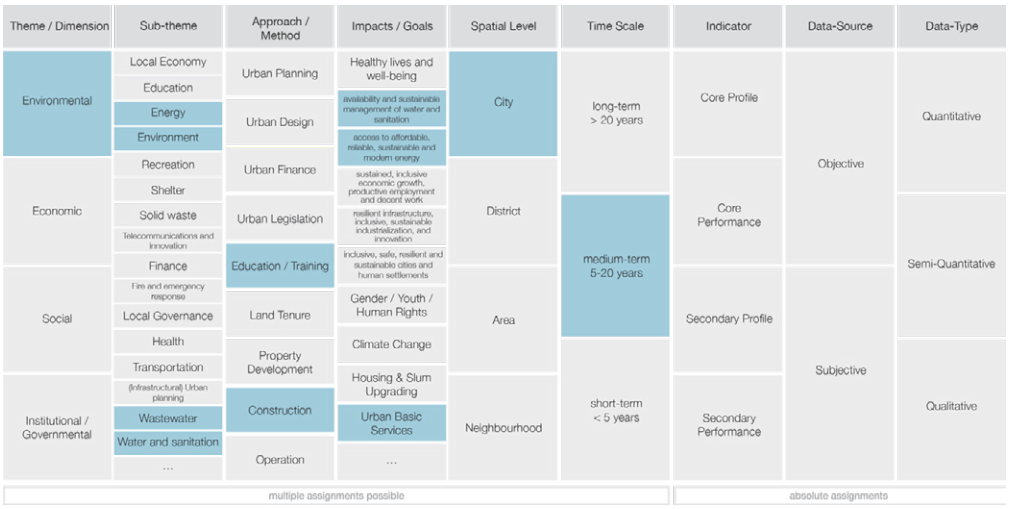


Figure 5: Assessment Framework adapted to Scenario 1 (Gall 2016)

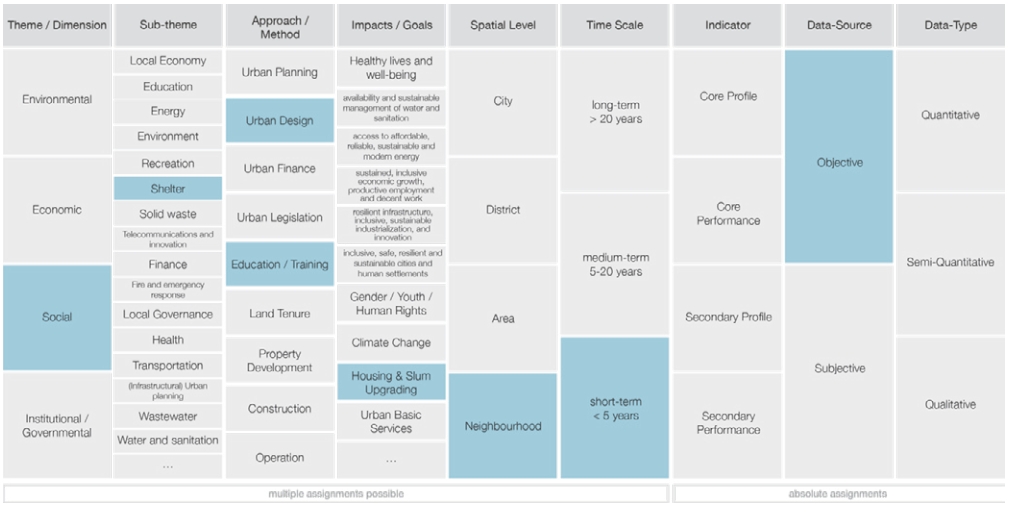
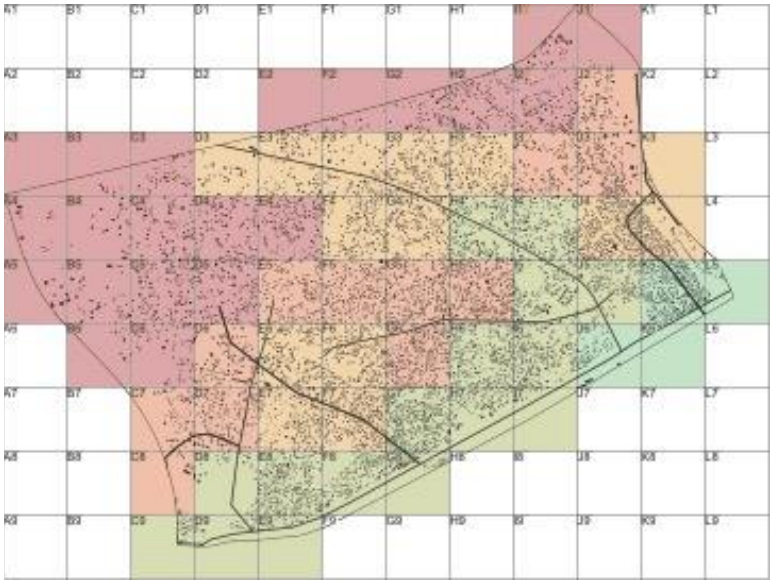


Figure 6: Assessment Framework adapted to Scenario 2 (Gall 2016)

List of sample indicators:

Core profile indicators	Population (by gender / age)
	Percentage of House Owners
	Density
	Average plot site
	Floor area per person
	Household size
	Automobile ownership
	Road length
	…
Core performance indicators	Distance to public transport / market / healthcare / recreational areas (in meter)
	Commute to school / work (in min.)
	Rent / Income ratio
	Permanent structures (in %)
	Quality of built structures (aggregated through floor type, wall and roofing materials)
	Access to water (defined through quality, daily period, minutes to access-point, stability)
	Access to electricity (in %)
	Access to private basic sanitation facilities (in %)
	Commonness and quality of solid waste management (aggregated through various factors)
	Housing affordability rate (aggregated through income, land-, construction, maintenance-cost, mortgage to credit ratio, …)
	…

Figure 7: Assessment Framework adapted to Scenario 2 (Gall 2016)



5. CONCLUSION

Indicator-based sustainability assessment as a way of tackling urban challenges in Malawi in particular, and sub-Saharan Africa in general, can support the decision-making processes of all involved stakeholders in many beneficial ways. Even if urban development decisions always need to be adapted to the country and site-specific conditions, the challenge of social housing and rapid urbanization is comparable in many locations around the world and specifically in sub-Saharan Africa. Therefore, the methods and results of this paper can function similar in other places and are applicable in various situations, even more through the ease of adapting and re-selecting performance indicators and more site-specific target values. However, the system does not function productively in practice yet through several factors. Highlighting the importance of re-evaluating the framework and system on a regular basis. First and foremost, it needs to be applied on a larger scale with as many data inputs and indicators as possible to identify possible challenges and develop an aggregation system which best reflects the actual urban fabric. Further, the lack of data is a major challenge, which needs to be addressed through more and various ways of input, including governmental institutions, international organizations, universities, and community involvement. Without enough data provided on a regular basis, it is impossible to use indicator-based assessment on a viable scale. Another issue is the extent and complexity of data and its assignment to geographical features which can be best archived through a full integration of GIS-systems. Even if most governments work already with GIS-data, it is still not common on a large scale, which is crucial for an easier application of the proposed framework. In the long term, we are aiming for a fully covered and regularly updated GIS databank which automatically includes all existing spatially assigned data from various sources. Without this basis, the shown application will probably always remain exemplary or will just be executed on small scale assignments which unfortunately reduces the viability of the whole approach. However, through more work on the topic, a better involvement of all stakeholders and the advancing utilization of technical opportunities, indicator-based sustainability assessment can contribute an important part to urban development and assist and automate many decisions through better visualization, comparison and generally better-informed decisions.

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Understanding variables for contextual re-generation of urban areas

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The current shift in the outlook of urban planning in India is towards SMART cities, and the focus is on designing economically competitive global cities ignoring local natural inclinations and synergy between culture, economy and spatial patterns. However, to arrive at suitable contextual planning guidelines, there is a need to quantitatively define different physical aspects of city which would likely effect its cognitive image. Thus, the aim of this study is to see how spatial pattern and functional distribution effects city's cognitive image. The objective of the paper is to propose a conceptual framework to assess the effect of urban spatial form and configuration on cognitive image of the city. All the factors effecting a city's cognitive image, obtained from literature study, has been broadly classified into three indices, accessibility, physical chaos and activity chaos to derive the latent variable, 'entropy' of the city. Then, a quantitative framework has been proposed to identify how the cognition of a place varies with respect to these indices.

1. INTRODUCTION

The current shift in the outlook of urban planning in India is towards SMART cities, and the focus is on designing economically competitive global cities ignoring local natural inclinations. While designing a city, we generally try to meet the goals, mainly regarding the hardware, i.e. housing, infrastructure needs and economic motivations. However, context development objectives are generally overlooked. As a result, we end up with similar looking cities with rows of buildings and structures just packed in the space according to need without any 'image' to make the city inviting or livable. In the face of growing Urbanisation, the primary aim is at maximising the accomodation potential of the city. The people residing there do not identify with the city and the 'sense of belonging' slowly dissuades leading to ego-centric community. As a result, the inhabitants do not 'give back' to the city.

It is often argued that, the people and the kind of activity happening in the city, gives the city its identity and culture. Thus, its image would develop organically with passage of time. But the major difference between the evolution of old cities and new cities is that, even the physical form of the old city had developed organically which does not happen in new cities. Any type of activity or human interaction needs a particular type of physical space, and when this physical space itself cannot develop organically, the development of the culture or the image of the city becomes less flexible. For example, for a vibrant street culture to sustain, the city needs to make provision for the volumetric cultural space (i.e. physical place like wide footpaths to include vendors, shops and sitting areas and competitive economic space) along the roads. Without such provisions, development of the vibrant street culture is likely not possible and in turn inherently impedes walkability. Also, The socio-economic fabric of the city does not only depends on the social and economic layers of the city, but also on the physical configuration and the context of the space.

Therefore, it is imperative for the new generation city planners to study the synergy between culture, economy and spatial patterns. This inter-dependency needs to be reflected in new city planning agendas. To arrive at a suitable neo city planning agendas and guidelines which includes contextual oriented development, there is a need to define and quantitatively measure the different physical aspects of the city which would likely effect the cognitive image of the city. The aim of this study is see how spatial pattern and functional distribution of the city effects its cognitive image.

The objective of the paper is:

- To identify and define the urban form factors that effects the cognitive image of the place.
- To propose a conceptual framework for quantitatively measuring these factors.

- To arrive at contextual planning framework for Urban Regeneration

The following sections of this paper are organized as follows. The next section of this paper presents a literature review on research directions regarding image of the city, measuring urban form and effect of urban form on image of the city. The next section of the paper deals with the concepts and definitions of the factors used in the conceptual framework. The subsequent sections deals with the conceptual framework and proposed methodology to measure the factors.

2. LITERATURE REVIEW

Understanding the effect of the image of the place on human behaviour and interaction becomes an important aspect of research in urban planning. Multiple disciplines have approached this issue from their respective perspective. However, no study exist in an integrated manner. Moreover, multiple disciplines uses different jargons which are either unfamiliar or too complex to be integrated in the policy administrative process. Various empirical studies have observed that the mobility pattern of a city depends not only on metric distance, but also on the city configuration and cognitive image (Noulas, et. al, 2012). Hillier (1993), in his concept of Space Syntax Analysis, have tried to quantify the network characteristics of urban street network and its effect on human movement. Many researchers have tried to incorporate the city configuration factors like land use mix, density, etc., into space syntax concept to arrive at a integrated framework to quantify the city structure and form (Ye, 2012). Cognitive science being a multi-disciplinary field, it has been dealt separately by various researchers with varied research themes and some disjointed studies have been carried out to establish the relationship between the cognitive image of the city and route and mode choice in a city (De Nadai, M., et. al., 2016, Downs, R.M., et. al., 1973, Hillier, B., et. al., 1993). Most of the studies used either indicators of urban configuration or network topology. In his research, Ye(2014) has tried to combine all the factors to provide a more holistic measure.

Measuring image of the city has always been a critical aspect in urban planning. There has been various theories to qualitatively describe the cognitive effects of a space design on its users. Lynch (1960), in his book ''Image of the City', forwarded the concept of Imageability. He argued ´that quality in a physical object which gives it a high probability of evoking a strong image in any given observer. It is that shape, colour, or arrangement which facilitates the making of vividly identified, powerfully structured, highly useful mental images of the environment.´

He put forth five elements of city design which affects the cognitive image of the city, namely, path (vibrancy, continuity, gradient, width), edges (boundaries, barriers, breaks), district (well defined character, homogeneous), nodes (junctions, strategic foci, interaction) and landmarks (uniqueness, contrast, symbolic). Various factors, such as levels of scale, strong centers, boundaries, alternating repetition, positive space, good shape, local symmetries, deep interlock and ambiguity, contrast, gradients, roughness, echoes, voids, simplicity and inner calm, and not separateness, (Alexander, C., et.al. 1977), pedestrianisation, diversity, etc. (Jacobs, J., 1961) have been identified by various authors, as factors of the city structure that effects the image of the city directly and thus, effects human behavior. On a more psychological and social need basis, factors like livability, character, connection, mobility, personal freedom, and diversity have been identified as the factors responsible for image building of a place (Smith, T. et. al., 1997). In the paper (Smith, T. et. al., 1997), the authors conclude that a walkable community, outdoor amenities, lots of seating, barrier free, and open space areas in residential areas are the most dominating physical design elements that generates desirable community quality. The concept of 'Phenomenology' is also used to qualitatively define a 'place'. Phenomenology is an approach that concentrates on the study of consciousness and the objects of direct experience, it prioritizes how we see over what we see. (Seamon, D. 2000, 2007).

A phenomenological theory of planning procedure would encourage planners to note what objects in their communities have meaning, and how different frames of reference give different meanings to each object. Phenomenological planning may involve seeing a house not as a "merely technological construction, but dwelling; not merely homogeneous and mathematized space, but place; not merely planetary raw material, but environment" (Seamon, D. 2000, 2007).

Another concept which deals which the emotional and sociological texture of a space, is the concept of Placemaking. Placemaking is an approach to design public spaces based on people's choice and their active participation. The "intrinsic-ness" of a place makes it unique. (Jana, et.al, 2015)

Most of the methods described above involve descriptive research, matrix development and

qualitative analyses. But, there is a need to quantify the factors for including these image building concepts into main line planning methods and guidelines. In the paper, Arabacioglu (2010), argues that,

Creating a mathematical model of architectural space with concrete results will offer many possibilities for design process in analyzing spatial organization, independently from in architect's experience and intuitions.

This quality of space has been defined by the authors which includes mainly with three factors, namely, transparency, stress and distance. The authors present a fuzzy inference system based spatial analysis model for spatial analysis for architectural design which can be later translated in city public space analysis.

2.1 Capturing people's perception

The major hindrance in such type of researches is the absence of an efficient system to capture peoples' 'likings and preferences'. The most common method of obtaining user preference is through questionnaire surveys. But, the basic disadvantage of such surveys are that they capture the users' preference as stated and not as revealed. Stated preference can be socially prejudiced and biased. Various attempts have been made to capture human preferences through drawings, video graphic, narrative survey, etc. The recent studies on cognitive image of a city uses crowd-sourced, location based social network data to capture human responses to a particular place. In the paper (Wakamiya, S., et. al., 2012), the attempt was to exploit crowd-sourced location-based life logs for generating a socio-cognitive map. For the purpose, the authors measure socio-cognitive distance among urban clusters based on human mobility data from Twitter logins to represent accessibility of urban areas based on crowd's movement. From the frequency of movement, the authors tried to find out the cognitive distance explained by the following equation.

CogDist(ci, cj) = w1*EucDist(ci,cj)+w2*ExpDist(ci, cj) (w1+w2=1.0, w1,w2 >=0)

ExpDist(ci,cj) = 1/(#MovSeg(ci,cj)+1)

where,CogDist, EucDistand ExpDist, calculate distances between urban clusters (ci, cj) in terms of cognitive, physical, and experiential, respectively. Specifically, the function CogDistis calculated by EucDistand ExpDist. The function EucDistcalculates normalized Euclid distance between urban clusters, and the function ExpDistcalculates normalized experiential distance between them based on the quantity of crowd's movements given by a function #MovSegwhich counts the number of moving segments between the clusters.The values computed by EucDistand ExpDistare weighted based on given values, w1 and w2, respectively.(Wakamiya, et. al., 2012)

While measuring behaviour, the focus has been mostly on travelers. The network and cognitive characteristics are mostly overlooked. Though these behaviour based studies tried to establish the possible relationship between form, behaviour and cognition, they are mostly done on very disaggregated level by considering only one aspect of the concerned issues. Most of the studies fail to considered the traditional factors while studying these new factors. A holistic study is needed to see the extent of effect of network and cognitive factors on travel behaviour and land use propensity. Moreover, quantification of cognitive factors yet remains a big challenge.

From the above discussion, three main factors affecting the image of a place could be grouped into three categories, physical form of the place (2-dimensional as well as 3-simensional), the physical and function hierarchy of the place with respect to the entire city or the region and human interaction of the city. All the factors, derived from the literature study can be grouped into the above three categories (see Figure 1). Thus, it could be safely assumed that, the three group of variables, urban form, physical and functional hierarchy and human interaction, can be seen as the variables affecting the image of the place. These three characteristics of a place taken together decribes the Entropy of the place.

2.2 Concepts and definitions

Some of the methods of measuring the above mentioned variables are described below:

2.2.1 Space syntax analysis:

The term space syntax encompasses a set of theories and techniques for the analysis of spatial configurations. It was conceived by Bill Hillier, Julienne Hanson and colleagues at The Bartlett, University College London in the late 1970s to early 1980s as a tool to help urban planners simulate the likely social effects of their designs. The three basic conception of space in the space syntax analysis are Convex space, Axial space and Isovist space. Convex

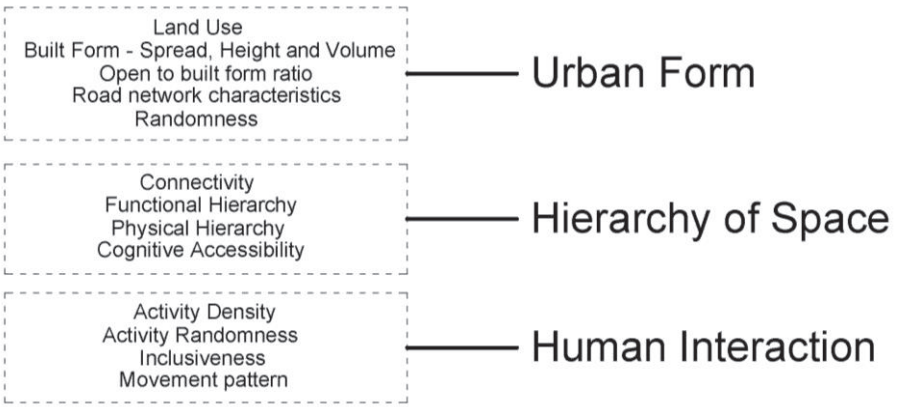


Figure 1. Grouping of all the variables effecting the 'image of the city'

space is a space where no line between any two of its points crosses the perimeter. Axial space or an axial line is a straight line ("sight line"), possible to follow on foot. Isovist space is the total area that can be viewed from a point.

This concept of space is developed into maps like Convex maps, Axial maps and Isovist maps. These concepts of space and maps are applied on the road network of a city for 'Analysis'. The concepts of social network analysis is applied to 'measure' the road network. Some of the measures can be connectivity, integration, control, choice, centrality measures, etc. Connectivity measures the number of immediate neighbours that are directly connected to a space. Integration is a static global measure. It describes the average depth of a space to all other spaces in the system. The spaces of a system can be ranked from the most integrated to the most segregated. This is also known as the global-integration analysis or integration radius-n analysis. However, an analysis can also be restricted at a lower depth of connectivity. For example, in an integration radius-3 analysis, only the units that are three depths away are considered in order to determine local integrations describing how each unit is accessible from all other units that fall within the restricted radius boundary (radius-3 in this case). Control value is a dynamic local measure. It measures the degree to which a space controls access to its immediate neighbours taking into account the number of alternative connections that each of these neighbours has. Global choice is a dynamic global measure of the "flow" through a space. A space has a strong choice value when many of the shortest paths, connecting all spaces to all spaces of a system, passes through it. Lastly, centrality measures like closeness and betweenness can also be used to measure a road network.

2.2.2 Volumetric density - space matrix method:

Building density and various building types has been represented simultaneously using the spacematrix method. The whole built environment can be divided into various categories having various combination of FSI (Floor Space Index), GSI (Ground Space Index) and building height. This helps to quantify such variables as intensity, compactness, non-built space, and building height, and thereby differentiate urban form efficiently (Berghauser, et. al., 2007, Rådberg, 1996). FSI gives an indication of an area's built intensity or plot ratio. GSI indicates the building coverage or ground-floor area. The spacematrix method also divides building types into low-rise, mid-rise and high-rise, based on the number of floors. It also separates buildings into point type, strip type, and block type based on construction forms.

2.2.3 Land-use mix

The MXI is a method used to quantify the degree of land-use mixture (Hoek, 2009). It measures

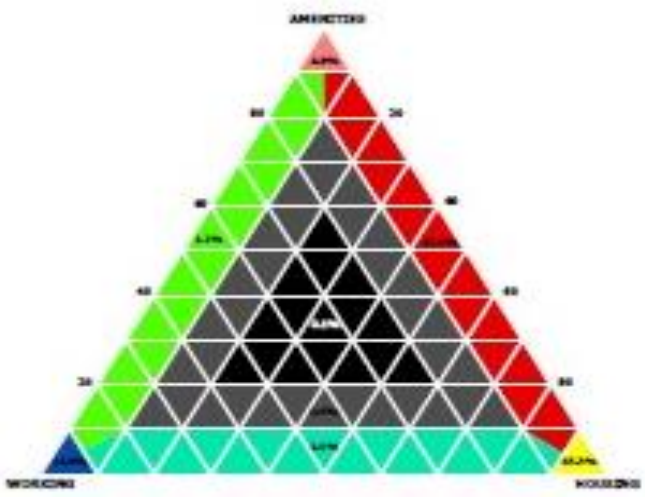
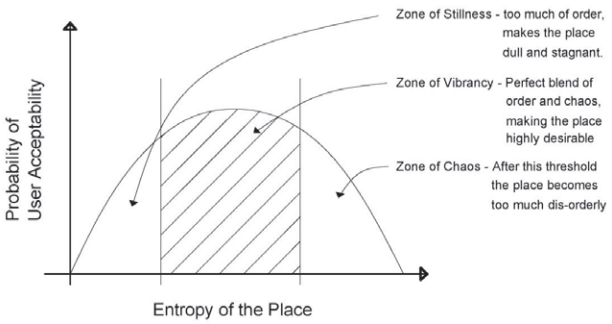


Figure 2: MXI guidelines for categorize urban form (Ye, 2012)

Figure 3: Variation of user acceptance with entropy.



the extent of functional multi-use. Figure 2 shows the interrelationships of the three major land-use categories. Each corner of the triangle represents the mono-use and as we move towards the center it represents multifunctional space. By setting up various categories depending upon the percentage mixture, we could classify the area accordingly.

2.2.4 Activity density:

The activity density is a measure of the density of any activities characteristic of that place. For measuring activity density, any indicators could be used, for example, footfall, electricity usage, the internet connections, or social network check-ins, etc.

2.2.5 Other measurements borrowed from different disciplines:

Sky-view factor - The sky view factor is the ratio between radiation received by a planar surface and that from the entire hemispheric radiating. This factor can be used in the analysis of urban public spaces as a measurement of the openness of the public spaces and the amount of radiation that place receives.

Brownian motion - Brownian motion is the random motion of particles suspended in a fluid (a liquid or a gas) resulting from their collision with the quick atoms or molecules in the gas or liquid. This concept of motion is equated to human mobility to find out the chaos in motion, treating the place a giant container. More the movement, more is the chaos and thus more are the conflicts, especially in the situation of a developing country with high heterogeneity of mode of movements.

Fractal analysis - Fractal geometry is defined as the same type of geometrical elements found at an infinite number of scales. The occurrence of the similar element asserts the existence of a hierarchical structure. Repetition of elements have always considered aesthetically pleasing, yet too much of repetition would result to monotony and lack of identity. Sometimes though, this particular repetitive element itself becomes the identity of the place.

3. THE CONCEPTUAL FRAMEWORK

A conceptual framework has been proposed to identify how the cognition of a place varies with respect to these indices. It is the function of this 'entropy' that provides the place its image. A place devoid of any chaos and which is not at all vibrant becomes dull and unsafe, and thus, does not attract people. But, obviously there would be a threshold of this entropy, after which the place becomes too much disorderly (chaotic) thus repel people (see Figure 3). After quantifying inhabitants' perception of the image of the place, captured through user perception surveys and other methods, it can be compared with the city entropy index.

The entropy index can be defined as the latent variable explaining the attractiveness and randomness of the city. of the place. This latent variable can be measured using the three observed variables, Urban form, Hierarchy of spaces and Human interaction. For the ease of mathematical representation of

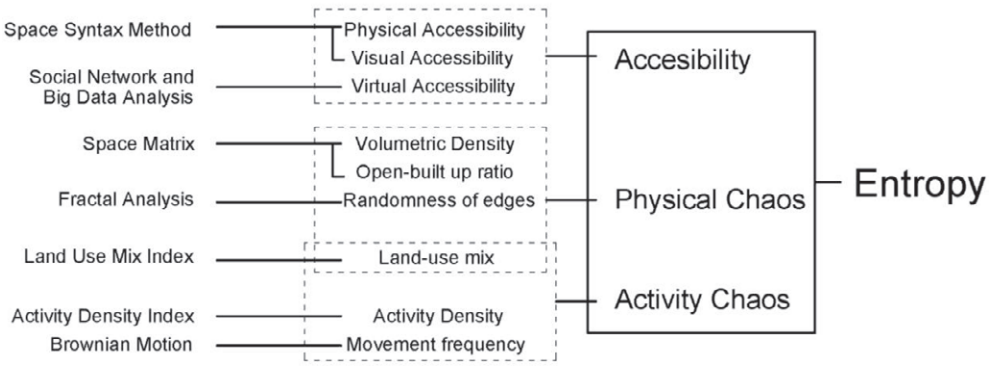


Figure 4: Conceptual framework

these factors, they are re-grouped according to their similarity of measurement technique. The entire framework has been explained in the following figure.

The factor accessibility is again measured with three factors, physical, visual and cognitive accessibility. The physical accessibility is defined as the ease of access to that place from the other parts of the city. This accessibility would depend on its connectivity to the rest of the city's network and also connectivity in terms of availability of proper modes of transport. To measure the two-dimensional configuration of the city, or the network characteristics, space syntax measures like betweenness, connectivity, reach, etc has been proposed. The visual accessibility of the place is measured through isovist polygons and the extent of the place being visible is measured. Here, cognitive accessibility is defined as the virtual closeness of the place in relative to the entire city. This closeness could be very different to the actual physical closeness owning to the place's importance and image that makes people assume it to be closer than it actually is. It is argued that a place with no randomness tends to become boring. But, also, a place with high randomness becomes chaotic and undesirable. Activity chaos is measured through activity density and chaos in movement is measured using concepts of Brownian motion. The physical chaos is measured using factors like land use mix, roughness of the edges (measured using fractal analysis), the three dimensional characteristics of the city and how lively and pleasant a place is. (building height variation, density, sky-view factor of the street, etc.)

4. APPLICABILITY AND DISCUSSION

For any given place, the entropy index can be calculated as per the above mentioned framework and plotted along with the captured user perception of the image of the place. The results would yield the threshold for vibrancy and chaos that represented the desirable level for a thriving public place. These results would serve as a guideline to the urban planners and designers to plan the city according to the inhabitants' aspirations. These results could be assumed to be uniform, with very little variations, across a homogenous region (region having similar cultural, political, socio-economical and physiological setup). The results would help planners to identify the area needing immediate attention and formulate appropriate policies for urban regeneration.

The most important point to note here, would be that the desirable thresholds of the entropy of a place would greatly vary with change in culture, socio-economic conditions and climatic conditions. Thus, coming up with any particular number would not be possible. Each and every place would yield different results and the agendas for regeneration of the place should be arrived at accordingly. Thus, with varying context, these results would differ, but the applicability of the framework remains universal.

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Bi-conceptual planning modelling in tackling rural threshold challenges in Nigeria

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Rural development involves a set of designed policies aimed at raising the pattern of living. Problems still persist despite research efforts due to single theoretical approaches. This study aims to tackle the rural threshold challenges in Nigeria using a bi-conceptual planning model. A cross sectional research-design was adopted. ´Central place theory´ and ´village regrouping´ form a bi-conceptual model. Both primary and secondary data were collected for the study. In testing the reality of the model, we chose case studies of selected villages in Ibadan, Nigeria with various development challenges. Focus group discussions were conducted among stakeholders such as elders, market women, the youth and farmers. The data were content analysed. The study identified six most prominent challenges of the people in the selected rural communities. These: internal conflicts; lack of citizen participation (which could be guaranteed by inclusiveness), threshold population; high level illiteracy. Lack of basic amenities and services were identified as being responsible for rural-urban migration creating a back-wash effect. Another major challenge was lack political will. The study concluded that a single model for solving this plethora of developmental challenges may not be ideal. Therefore, the aforementioned bi-conceptual planning model was suggested to bring the population to a reasonable level of threshold. This would guarantee the location of those facilities and amenities, which absence have acted as push factor from the rural area, thereby bringing the region to balance.

1. INTRODUCTION

The rural areas of Nigeria are inhabited by the bulk of the nation's population; they serve as the base for the production of food and fibre. They are also the major sources of capital formation for the country, and a principal market for domestic manufactures (Olatunbosun, 1975). In general terms, vast majority of inhabitants of rural communities engage in primary activities that form the foundation for any economic development. Yet, despite the importance attached to these rural areas, they are not attractive to live in. There is an absence of infrastructure such as portable water, electricity and good feeder roads, that diminishes the quality of life the locals. Rural inhabitants have low purchasing power and living standards. Attempts at solving the local problems have been the concern of the governments as well as corporate bodies over the years. The contention of policy makers is that infrastructure, if adequately provided, can enhance the quality of rural life. However, it is assumed that the inhabitants have benefitted very little from most rural development programmes. Despite all the intervention programmes, there are still developmental challenges pervading the rural fabrics all over Nigeria. This call for an investigation: why such failure continues to beat all the interventions? It is against this backdrop that this paper seeks to assess the challenges of facility planning in Ojedeji Rural Area of Akinyele Local government Area. It primarily aims to get first-hand information about the inhabitants´ challenges and how best to help ameliorate the challenges. The paper is divided into eight sections. The first section deals with introduction of the rural area with particular reference to Oyedeji being the case study. Immediately after this introduction is the statement of the research problem. The third section is devoted reviewing relevant current literature on the subject. In the fourth section, various theoretical interventions in solving infrastructural problems are reviewed. The fifth section is devoted to explaining and presenting the study area this followed by research methodology and discussion of findings. The last section is devoted to concluding the study and proposing some strategies to address threshold challenges in Nigeria's rural area.

2. PROBLEM STATEMENT

In most countries of the world, different geographical areas are not endowed the same way, in terms of human, natural and material resources. Hence some areas tend to grow and develop at a higher

rate, at the expense of others. Good examples are urban areas which tend to experience rapid growth while rural communities either stagnate or shrink in size. The emerging development patterns as identified by Adeniyi (1983) show that there are disparities in development between urban and rural areas and among different geographical areas in the country. This necessitates a deliberate intervention in resource allocation or reallocation, opportunities distribution, and overall development pattern.

The problem of threshold population has been a common phenomenon in rural communities. In most rural communities, literacy is still low. Infrastructures such as potable water, electricity, health care and good housing are still lacking and where available are in a dilapidated state.

In spite of the abundant resources in the rural areas in Nigeria, rural areas for many years have not received the deserved attention in terms of policy formulation and implementation. This is an indication that rural areas, which currently accommodate over 60 percent of the Nigerian population had long been neglected (Olujimi, 1988, 2003). Similarly, the long neglect of these areas in Nigeria has always been associated with a high poverty rate and underdevelopment. It has also resulted in the classification of the zones as areas with high propensity for outmigration. Olujimi (2011) established that the long neglect of rural areas has equally resulted in a non-availability of rural infrastructure in the areas. The lack of rural infrastructure has been the bane of the rural problem, which often time's governments on their own part have been hiding under the pretext that the scattered distribution pattern and the small population in the villages have not made the provision of rural infrastructure in villages a viable project.

Lack of spatial focus in rural development planning has handicapped the rural infrastructural programmes. Usually, most villages in the country are scattered which raises the problem of threshold population for sustaining infrastructure provision. For instance, in Ojedeji Village has no adequate population size to support facilities like hospital, secondary schools, etc. Villages of similar size where infrastructures like schools and hospitals were provided before have witnessed the closure of these facilities due to a lack of required threshold population.

Ojedeji village by nature lacks the fund, power and political will to decide on the type and quantity of its infrastructural needs. Cases which embark on community development usually result in the abandonment of the project as witnessed in the Ojedeji rural area where they started constructing a health centre which has been abandoned due to lack of funds.

The rural community of Ojedeji lacks other means of encouraging rural infrastructural provision. For example, the lack of good roads, potable water and electricity hinders the development of socio-economic activities which could improve their source of livelihood. There is also a lack of access to infrastructure and services are limited (largely because of distance, low density and limited capacity to pay). They have fewer opportunities for earning cash; more for self-provisioning. The reliance on favourable weather conditions is greater.

The population is made up of elderly people who are not productive, whereas the young people have migrated to urban areas in search of better opportunities. Also, livelihoods are dependent on access to rural capital which includes crop cultivation, livestock, forestry or fishing. All these raise the question of threshold which is required to handle the existing development challenges.

3. LITERATURE REVIEW

3.1 Nigerian rural infrastructural policies over the years

Pre-Independence Period

Government's involvement in infrastructural provision began as far back as 1917 when the colonial government promulgated the Township Ordinance. This ordinance classified settlements in the country into three classes: namely, the first, second, and third class townships. The first class townships harboured the whites and their workers. There was heavy concentration of infrastructure in these settlements (an example Lagos). They differ from the second and the third class townships, which received little or no facilities. The situation continued until 1952 when the local government councils were established in Western Nigeria, the local governments were seen as avenues through which infrastructural facilities could be extended to the rural areas. But then, the fund allocations to the local governments were hardly enough to maintain facilities in the council headquarters. In fact, little or no fund was available to initiate new schemes for rural development. Yet ironically, in spite of the limited benefits of the colonial policies, the investment pattern established during the colonial period was further consolidated by subsequent governments after independence. This is evident in

all the development plans initiated since 1960.

Post-Independence Plan Period (1960-Date)

We shall attempt to summarize the post-independence plan period under five major eras: The First National Development Plan Period (1962-68); The Second National Development Plan Period (1975-80); The Fourth National Development Plan Period (1980-85); and The Post Fourth Plan Period (1985-1990).

The First National Development Plan (1962-68): The First National Plan of Nigeria (1962-68) had a total budget allocation of N1, 353 million. The plan made no clear statement on rural infrastructural development. As agriculture was still an important exchange earner, the plan's objectives were to encourage the assemblage of agricultural products for export purpose.

The Second National Development Plan (1970-74): The Second plan was launched shortly after the end of the civil war. The plan attempted to rehabilitate economic activities in the war-affected areas. The plan spelt out five principal national objectives meant to achieve a united, just, strong and self-reliant nation. Some N2, 050.738 million was allocated as expenditure. But just as in the first plan, government did not make any clear statement on rural infrastructural development. However, it was stated in the plan that government was committed to spend N500, 000 for village regrouping. This was perhaps to reduce the cost of providing economic and social infrastructure such as health, electricity, water and educational facilities for the rural areas. The sum allocated to rural development looks too paltry, and generally like the previous ones. The plan failed to introduce any radical package towards rural infrastructural development.

The Third National Development Plan (1975-80): Serious concern for rural development at the national level was first highlight in the third national development plan. The objectives of the plan were similar to those of the second national development plan. The plan emphasized the need to reduce regional disparities in order to foster national unity through the adoption of integrated rural development. The total budget allocation in the third national development plan was N32 billion. The plan provided for: - the allocation of N90 million towards nationwide rural electrification scheme: - the establishment of nine River Basin Development Authorities (RBDAs) in addition to the two existing ones (Sokoto and Rima (RBDAs); - the construction of small dams and boreholes for rural water supply and the clearing of feeder roads for the evacuation of agricultural products and – the supply of electricity to rural areas from large irrigation dams.

The Fourth National Development Plan (1981-85): The Fourth National Development Plan exhibits several distinguishing features. First, it was formulated by a civilian government under a new constitution based on the presidential system of government. Second, it was the first plan in which the local government tier was allowed to participate fully in its own right (Fourth National Development Plan, 1981).

The plan emphasized, among other things, the need for balanced development of the different sectors of the economy and of the various geographic areas of the country. It emphasized the importance of rural infrastructural development as a vehicle for enhancing the quality of rural life. Consequently, about N924 million was allocated to the eleven River Basin Development Authorities whose functions include, among other things, the construction of boreholes, dams, feeder roads and jetties. About 12,064 kilometres of feeder roads, 2,650 boreholes, 2,280 wells, 20 farm service centres and 249 earth dams, were expected to be constructed by the River Basin Development Authorities. The Federal Government allocated N645 million for a country-wide electrification, and in addition all the states of the federation allocated N700.4 million for the electrification of about 1,600 towns and villages.

The Post Fourth Plan Period (1985 to Date): The post fourth plan period witnessed the establishment of the Directorate for Food, Roads and purpose of providing rural infrastructure in the country side. The laws establishing the Directorate was promulgated under Decree number four in 1987. The core of the Directorate's programme was the promotion of productive activities. Besides, the directorate recognized the provision of rural infrastructure such as feeder roads, water, electricity and housing as essential for the enhancement of the quality of life in the rural areas.

The programme of the directorates includes:

- The organization and mobilization of the local people to enhance or facilitate closer interaction between the government and the people. In addition, the local communities were asked to form unions or associations for the purpose of providing common facilities for themselves;

- The provision of rural infrastructures such as rural feeder roads, rural water and sanitation, rural housing and electrification;
- The promotion of productive activities such as food and agriculture, rural industrialization and technology;
- The promotion of other extracurricular activities such as socio-cultural and recreational programmes, intra- and intercommunity cohesion activities. The plan for the implementation of DFRRI programmes was organized into two phases.

According to Saleh (2015) other development strategies include a hierarchical market or service centre strategy which is based on the assumption that for any rural planning to be purposeful, some kind of historical system is necessary to ensure efficient supply of social services to the distressed rural population. The creation of hierarchical market centres and the development of rural services in any micro-region are also based on the assumption that every rural producer needs to be within a convenient travel time of some adequately competitive selling places for his product, some equally competitive sources of consumers and producers, goods and some adequately diversified service centres.

Furthermore, growth centre strategy advocates that making a regional plan should include an assessment of the availability within the region of suitable growth centres and the formulation of a list of activities and services to be concentrated in them. The rationale is that bigger towns are more attractive than smaller towns, and that it is necessary to deliberately channel new developments to a number of selected towns (Saleh, 2015).

The strategy of Community Development and Co-operative Schemes was also one of the strategies used in regional development according to Saleh (2015), the view of this strategy is that the full fruit of social progress is only meaningful if realized by a society in which the majority of men and women are not only perceived recipients but practical contributors. Today, people are encouraged by governments to organize themselves in groups and engage in self-help undertaking as a way of making a practical contribution to the welfare of the society in which they live. In rural areas, these self-help undertakings go by the name community development, or rural co-operatives.

4. THEORETICAL INTERVENTION IN SOLVING INFRASTRUCTURAL PROBLEMS

In tackling problems of rural areas both policy makers as well as academia have contributed in making sure that the development of the rural area is attained. There are several theories that have been used in providing solutions to the rural development challenges. However, more often than not, those theories are not sufficient to handle the problems, given the multifaceted and multidimensional nature of rural problems. Similarly, since the rural policy programme has been failing as identified in literature, it therefore will require that theories be considered to understand what the problem is and be able to carefully handle it. It might not be possible to explore all the rural development theories. Therefore the central place theory and the concept of village re-grouping are considered.

4.1 Central place theory

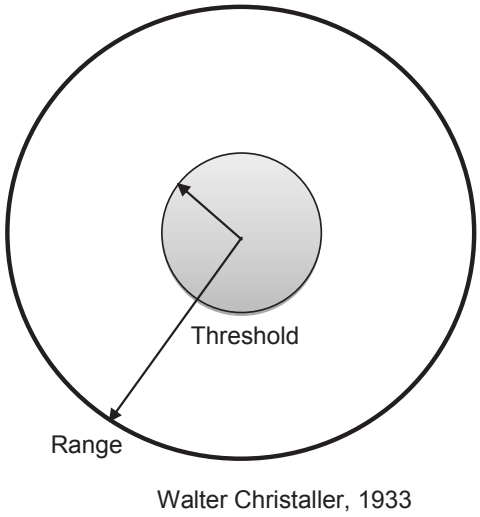
The Central Place Theory (CPT) is an attempt to explain the spatial arrangement, size, and number of settlements. The theory was originally published in 1933 by the German geographer, Walter Christaller, who studied the settlement patterns in southern Germany. In the flat landscape of southern Germany, Christaller noticed that towns of a certain size were roughly equidistant. By examining and defining the functions of the settlement structure and the size of the hinterland, he found it possible to model the pattern of settlement locations using geometric shapes.

Assumptions: Christaller made a number of assumptions such as:

All areas have

- an isotropic (all flat) surface
- an evenly distributed population
- evenly distributed resources
- similar purchasing power of all consumers and consumers will support the nearest market
- transportation costs equal in all directions and proportional to distance
- no excess profits (Perfect competition).

Figure 1. Details of the Theory



Walter Christaller, 1933

Explanation of some Terms: Central Place, Low Order, High Order, Sphere of Influence

A Central Place is a settlement which provides one or more services for the population living around it. Simple basic services (e.g. grocery stores) are said to be of low order while specialized services (e.g. universities) are said to be of high order. Having a high order service implies there are low order services around it, but not vice versa. Settlements which provide low order services are said to be low order settlements. Settlements that provide high order services are said to be high order settlements. The sphere of influence is the area under influence of the Central Place.

Details of the Theory

The theory consists of two basic concepts:

- threshold: the minimum population that is required to bring about the provision of certain goods or services

- range of good or services: the average maximum distance people will travel to purchase goods and services

From these two concepts, the lower and upper limits of goods or services can be found. With the upper and the lower limits, it is possible to see how the central places are arranged in an imaginary area.

4.2 The concept of ´Village Regrouping´

The main aim of regrouping villages is to create larger settlements where small industries, markets and community services can be provided at less cost per head. The more concentrated the population of an area is the better the chances of accommodating industries are. This strategy therefore, through the creation of relatively large settlements, provides the necessary threshold population which makes viable the location of certain socio-economic facilities, markets and services. It is a fact, which cannot be denied that it is more costly to provide social amenities to dispersed rural populations than to concentrated villages. Administration of taxes, law and order, supervision of welfare services and other publicly induced development programmes are cheaper to provide where people live closer together than in scattered populations (Onakomaiya, 1981 and Mabogunje 1974).

A village regrouping strategy seeks to use selected central villages as district centres serving a group of villages and attracting enhanced job opportunities for migrants who might otherwise move to large cities. The exponents of this strategy also believe that grouping of scattered villages into large rural centres will lead to a better and easier management of rural development programmes.

Village regrouping is an exercise that very much relates to population resettlements schemes. It involves the movement of people from the original domicile to another place, usually an existing village, or a vacant site. The need for regrouping and the subsequent movement of people may be seen as a result of several and varied forces.

People move from their original domicile to another site in order to adjust to natural disasters such as floods, earthquakes and epidemics. People are also sometimes moved and re-grouped as a result of major man-initiated technical enterprises such as dam construction, or gigantic land development projects and urban settlement development. Movement also results due to political problems

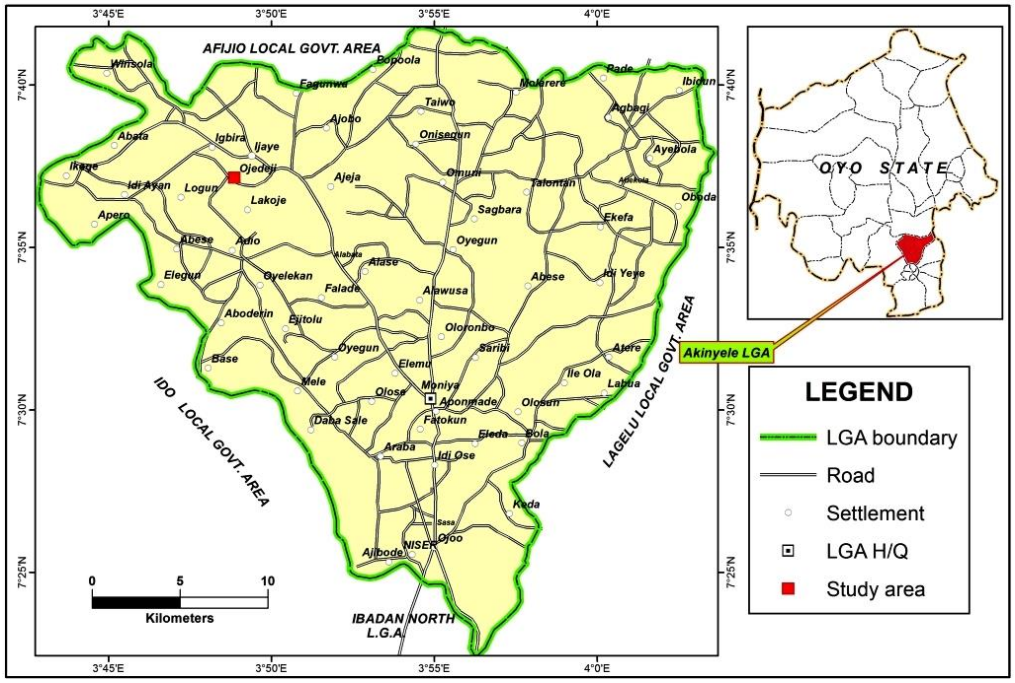


Figure 2. Study Area of Oyedeji in Akinyele Local Government Area of Oyo State

of mass deportation of a group of people from one territory to another. There could also be a movement of regrouping out of the sheer desire to create a necessary threshold for socio economic amenities. Fundamental to all these types of movements and their associated regrouping is that they are undertaken either compulsorily or voluntarily. Incidentally, however, a voluntary movement is a movement as a result of a foreseen objective which is the underlying principle of planning, which is lacking in most respects (Onakomaya, 1981).

5. STUDY AREA

The study area is Akinyele Local Government Area (LGA) of Oyo state. Akinyele Local Government is located on the longitude 30045 E-40 0 E and the latitude 30 15 N-70 30N and in the altitude of about 225 m above sea level (see Figure 2). Five local government areas bind the local government area. Infrastructural facilities in the study area include basic amenities that are in a deplorable condition in Odedeji settlement. The population in the area cannot support the existing threshold for facilities provision

6. METHODOLOGY

A cross sectional research design was adopted. The central place theory and village regrouping as a bi-conceptual model was adopted. Both primary and secondary data were collected for the study. In testing the reality of the model, the case study of Odedeji village, Akinyele Local government, Oyo state in Nigeria with various development challenges was chosen on purpose. Focus group discussions were conducted among some stakeholders such as elder persons (community leaders), market women, the youth and farmers. The results were analysed.

7. DISCUSSION OF FINDINGS

The FGD revealed that the community's time of existence can be traced as far back as the 1800s from the Ogunmola battle in Ijaiye, which caused the people to migrate to Ajeja, Akwuro then to Ojedeji, from which they finally moved to their present location. It has a population of 800 people and the building ranges between 80 houses. The established long history of the existence of the village coupled with its proximity to the Ibadan metropolis should have brought a significant increase in the size of the population that could guarantee the allocation of facilities for rural development. However, unfortunately the population is far from reaching the desired threshold. This further reveals that the study area has the characteristics of a rural community.

The study further revealed lack of community participation. According to FGD, the approach to rural development employed by government was rather top-down, as there is an absence of total community participation. This results in people´s lack of willingness to respond as they are regarded as being 'incapable of standing on their feet'. The study also revealed that there is a lack of grassroots planning in the study area, as little or no attempt is given to the rural communities to identify the problems and goals, analyse their own needs, and commit themselves to the achievement of targets. According to the FGD, local experts, Chiefs and community leaders were taken for granted in deciding what projects to embark upon, and where

and how to execute them. Instead, they embarked on community effort in providing their needs. They further listed the project embarked by the community to include:

- Construction of health centre which has been abandoned due to lack of funds
- A row of shops were built and open stall was provided as market for Fadama III (floodplain farming) agricultural project
- The community has been solely relying on the natural spring as water-source but shortly before study a borehole was sunk and a police post was built for the community by a philanthropist (Pastor Kasali, an indigene of the area).

Through the FGD it was observed that although the Baale (Community Head) informed us about a philanthropist, he also wishes to provide electricity for the area. The youth arm encouraged more community based organizations and NGOs to come to the aid of the community in terms of infrastructural provision. The study further revealed that government had not used available local resources in the study area optimally. Local talents and manpower as well as other resources were also ignored, thereby losing the opportunity of evolving appropriate technology. The study revealed that the people were predominantly into farming and petty trading. Among others youth activities, included playing football. All these resources can be harnessed and used optimally to the development of the community. They claimed that the long year of neglect have contributed to a lack of harnessing the resources.

The study identified the lack of cohesive identity among the community. It was observed that any innovation that did not either guarantee the cohesiveness of the group or respect their history and beliefs had little hope for survival.

8. CONCLUSION AND RECOMMENDATION

It was observed that the major problem faced by these people is the lack of threshold that could justify the allocation of infrastructural facilities in the area. This owed to the kind of theories applied in allocating the resources to the people thereby neglecting the rural poor from benefitting from the resources. Therefore, the study concluded that a single model for solving this plethora of developmental challenges may not be ideal. Therefore, a bi-conceptual planning model is suggested to bring the population to reasonable level of threshold that will guarantee the location of those facilities and amenities whose absence have acted as push factor from the rural area. This is expected to result in a more balanced region.

1. Application of a bi-conceptual model in tackling the rural threshold challenges in Nigeria. - In the application of the theory, one of the first actions is the identification of the existing problem. At this stage of development the planner identifies the challenges that are inherent in the community of interest (Mainly Infrastructural and facility challenges). This also includes the sampling of the villages that have similar challenges (see Figure 3).

2. Understanding the Setting. The planners have to get involved knowing the cultural configuration of the communities. At this

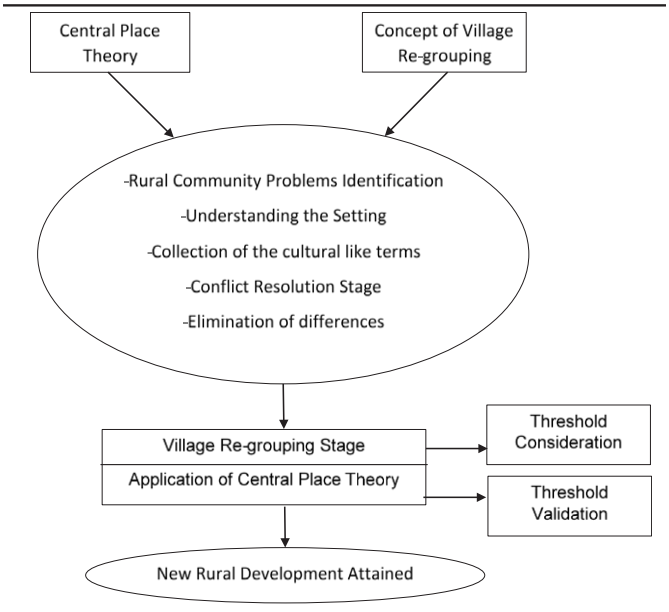


Figure 3. Bi-Conceptual Planning Model. Source: Jimoh, 2016

stage, the planner needs to get familiar with both the endogenous and exogenous variables of the communities of interest.

Collection of the Cultural Like-terms. At this stage of human development, the cultural differences have to be identified. This centres for the collection of cultural like-terms and is able to know the area of differences and the similarities.

Conflict Resolution Stage. At this stage, conflict resolution strategy is embarked upon. Thus, all the area of conflicts identified by the planner has to be resolved through an effective resolution system. This can also be enhanced through the elimination of the cultural differences.

Village Re-grouping Stage. The village regrouping stage is at the lower box. This comes up immediately after the conflict resolution and elimination of the differences. Then the population is considered through the regrouping of the village for an ideal threshold.

Central Place Theory. At this stage the population threshold is validated. This includes the agreement of the communities involved in the identification of the type, location and standard of the facilities and service provisions required, which links implementation strategies to other planning mechanisms and resourcing arrangements. Since, the community facilities and services generally operate within a hierarchy of provision, with different scales of infrastructure servicing varies sized catchments. For example, primary schools, child care centres and community halls generally service local catchments; secondary schools and community health centres generally service district catchments; and hospitals, universities and correctional centres service sub-regional or regional catchments.

New Rural Development Attained. In this case the rural infrastructure is provided to enhance the economic activities as well as livelihood in the area. Then People can stay behind in the village and be productively engaged. Thus, the rural threshold problem is tackled, which eventually eliminates a backwash effect continuously created by regional imbalance

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Spatial planning in Nairobi: beyond the post-colonial paradigm?

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The dismal performance of spatial planning in African cities is partly attributed to colonial and Western development and planning models. However, over the years, the number of development actors in the African city has expanded to include East development partners such as China and Japan. This article is an attempt to explore how the recent Nairobi Integrated Master Plan (NIUPLAN), developed by the Nairobi City County government in collaboration with Japan International Cooperation Agency (JICA), differs from colonial and immediate post-colonial planning primarily driven by the West. The research examines to what extend NIUPLAN's proposals on housing, transportation and service provision address informal settlements that embody socio-spatial inequalities and host over 50% of Nairobi's population.

1. INTRODUCTION

Past urban Planning has failed to deliver in African cities (Watson 2009a, Huchzermeyer 2011, HABITAT 2014). The discourse on this dismal performance of planning is largely located within the broader context of global political economy and international development - with planning 'failure' partly attributed to context inappropriateness of planning policy, colonialism and neo-colonialism through the continued dominance of the West on African development policy (Boniburini 2011, Andersen, Jenkins et al. 2015). Upon independence, African cities inherited planning policies initially introduced in Africa as colonial tools to further oppression and the interests of colonial powers (Myers 2003, Slaughter 2004, Njoh 2009). Post-independence, African states still continue to rely on the West for development assistance championed by agencies such as the World Bank, IMF and United Nations agencies. These agencies are however seen as an extension of Western hegemony into the African continent that continue to exploit the development frustration of nations, by forcing them to implement programs that not only reinforce but create the conditions they purport to remedy (Njoh 2009, Watson 2009b, Boniburini 2011, Eze, Elochukwu et al. 2015).

This dissatisfaction with West derived development models and shifting geo-politics is alienating African nations, driving them towards the East for development inspiration and capital (Eze, Elochukwu et al. 2015). The shift is evidenced by the increased collaboration and partnerships between African Countries and the East (especially Japan and China). For instance, since 1993, Japan has been actively involved in Africa's infrastructure and human resource development through the Tokyo International Conference on African Development (TICAD) and JICA. During the 4th TICAD conference in 2008, Japan pledged to double its Official Development Assistance and direct investments in Africa (TICAD 2013). Similarly, China's presence in Africa's development agenda has been growing over the years (Alden 2007). Between 2000 and 2007, China established bilateral relations with several African countries aimed at encouraging China's investments on the continent (Davies, Edinger et al. 2008). In 2007, China hosted the China- Africa summit, which saw the establishment of China-Africa Development Fund to finance development in Africa (Campbell 2008). Through these development collaborations and commitments, several mega infrastructure projects are currently under way in countries like Tanzania, Nigeria, Angola, Ethiopia, DRC and Kenya funded by China and Japan governments or agencies (Alden, Large et al. 2008, Power and Cristina 2012).

Advocates of these development partnerships argue that they stand to produce better and equitable outcomes than those directed by the West, as they are based on mutual respect and shared interests (Hinga and Yiguan 2013). Ramo claims that the Chinese development model 'is driven by a desire to have equitable, peaceful, high quality growth', at least in China (Ramo 2004). In a March 2016 policy workshop held in Nairobi, in anticipation to TICADIV, both Japanese and Kenyan delegates applauded Japan for coming to the aid of Africa through TICAD when the West had disserted the continent. The Japan Ambassador to Kenya stressed that, the Japanese

development model is built on teaching Africa how to fish unlike the West approach of poverty eradication akin to giving a man fish (Kenya 2016). But do these developments under South-East partnerships really differ from those previously informed by Western derived policies, and particularly in their ability to address socio-spatial and economic inequalities?

This paper hopes to explore the above question by analysing the Nairobi Integrated Urban Development Master Plan (NIUPLAN) developed by the Nairobi City County (NCC) government in collaboration with Japan International Cooperation Agency (JICA) in the year 2014. The purpose of the analysis is to explore the character of NIUPLAN as a representation of plans and projects directed by East agencies to determine the extent to which they reflect or represent a changed approach from those that preceded them and especially in how they address social, spatial and economic inequalities. The focus of this paper is particularly on how NIUPLAN proposals address informal settlements, which represent poverty and exclusion in Nairobi.

The paper is divided into three main sections. First, I discuss the legacy of colonial and West planning models in Nairobi; second, I highlight and discuss the general recommendations of NIUPLAN regarding housing, service provision and transportation in the context of informal settlements. Lastly, I conclude with thoughts on what the South-East partnership may mean to the dismantling or perpetuation of socio-spatial inequalities in Nairobi based on NIUPLAN's handling of informal settlements.

2. SOCIO-SPATIAL INEQUALITIES IN NAIROBI AS A LEGACY OF COLONIAL AND WEST DRIVEN POST-COLONIAL PLANNING POLICIES

2.1 Introduction to Nairobi City

Nairobi is the capital and largest city of Kenya, with a population of over 3 million people (KNBS 2010). The city is both a national and regional economic hub for Central and East Africa. Nairobi alone generates over 50% of the national GDP and accounts for more than 50% of Kenya's formal employment (JICA&NCC 2014). Despite its functional and regional significance, Nairobi is characterized by high socio-economic and spatial inequalities, embodied by informality and informal settlements (K'Akumu and Olima 2007, Huchzermeyer 2011). Over 50% of Nairobi residents live in about 5% of the total residential land crammed in over two hundred informal settlements (International 2009). The housing in informal settlements is of low quality, usually made with temporary materials. These settlements are also underserved by public infrastructure and services such as energy, transport, water and sanitation. According to a 2004 Nairobi slums study by (Gulyani, Bassett et al. 2012), only 19% of respondents had access to piped water either through individual connections or yard tap. Likewise, only 22% had access to electricity connection with just 29% reporting connection to formal or informal public sewer. The rest used pit latrines or flying toilets.

Similarly, the provision of public social services such as schools and healthy facilities is disproportionately low in slums as compared to the rest of the city. There is barely any public school or health facility in slums. In 2009, Amnesty International observed that about 130,000 residents of three villages in Kibera relied on one NGO-run healthy facility. Equally, about 25,000 residents of Soweto village in Kibera did not have any public school. Children in these areas rely on NGO-run schools or low quality but costly private schools provided by entrepreneurs in the slums. Otherwise they have to walk long distances to access public schools (Tooley, Dixon et al. 2008). These settlements also lack transport infrastructure and access roads, hence limiting resident access to public transport. Consequently, slum dwellers are forced to walk long distances to work, school or to access other services (International 2009).

2.2 The role of colonial and post-colonial planning in creating or reinforcing socio-spatial inequalities in Nairobi

Like in many other African cities, Nairobi's current inequalities and socio-spatial inequalities are partly attributed to colonial planning legacy and the continued dominance of Western policies among other factors such as rapid urbanization, capitalist development and urban poverty (K'Akumu and Olima 2007, Boniburini 2011). The stringent planning standards, anti-urbanization stance and racial discrimination elements enshrined in colonial and post-colonial planning policies are believed to have created a ground for the growth and expansion of slums in Nairobi. For instance, the 1926 and 1948 Nairobi colonial plans incorporated racial segregation zoning, creating exclusive enclaves for foreign settlers and separate zones for natives in low value zones (Charton-Bigot and Rodriguez-Torres 2010). Proper infrastructure investments were provided in the white occupied parts while little or no investments were made in the native occupied zones (Owuor and Mbatia 2008). After independence racial segregation transformed to 'socio-economic and legal-tenural residential segregation' as government bureaucrats and elites re-allocated

themselves the hitherto white occupied affluent zones while the poor masses remained in low value underserviced zones (K'Akumu and Olima 2007:87).

Nairobi colonial plans and policies were also anti-urbanization, particularly in relation to native population urbanization. Colonial policies restricted natives from moving into urban areas by instituting pass laws that prevented African moving in the city unless they had a job as well as limiting housing production for the African population in the city (Huchzermeyer 2011). The restriction of the African from the city coupled with the limited housing production and Africans low wages forced natives to establish informal settlements on the fringe of the city (Anderson 2001, Olima 2001). Informal settlements were considered illegal and ineligible for service provision. At independence, rapid urbanization occurred, following the elimination of the pass laws. This population explosion could not be accommodated in the limited existing formal housing and thus led to the growth of new slums and expansion of existing ones. According to Ngau, (1975), the housing units in slums rose from about 500 in 1952 to about 22,000 in 1972 and accelerated to about 111,000 in 1979 (Olima 2001). Independent Nairobi did not formalize slum areas. In fact, the response to informal settlements by the government was largely negative ranging from brutal evictions to outright denial of service extensions (ibid).

Past Nairobi plans were also replicas of European stringent planning standards based on modernist ideals. The main objective of the 1926 plan was to 'turn Nairobi into a thing of beauty' (Myers 2003:195), while the 1948 plan envisioned Nairobi as a 'European Type Town, that is European in Architecture, a little frigid, but efficient, tidy and progressive' (Slaughter, 2004: 39). The consequence of this modernist approach and the adoption of stringent building standards was that, most natives could not meet the prescribed standards nor afford the proposed 'modern' materials and thus ignored such rules and used local construction materials (Anderson 2001, Huchzermeyer 2011). Structures built using local materials were termed temporary or illegal and therefore ineligible for public service provision. Upon independence, the government adopted the same stringent planning tools as well as continued to rely on Western agencies such as the World Bank and UN HABITAT for planning and development ideas.

Since 1970s, the World Bank has directed as well as funded low-income housing projects and slum upgrading projects in Nairobi such as the Site and Service Schemes and Kenya Informal Settlement Projects (KISIP). The UN HABITAT is also instrumental in providing direction on slum upgrading in Nairobi with a recent attempt being the Kibera Soweto Slum Upgrading project. These models have failed to deliver. The Site and Service schemes of the 1980s by the World Bank hardly reached the targeted poor population. Rather, benefits accrued mostly to middle income population due to affordability issues among other factors (Boniburini 2011). The Kibera Soweto slum upgrading project supported by UN HABITAT is already displacing residents owing to unsustainable and unaffordable repayment requirements to current slum dwellers (Huchzermeyer 2008).

While the failure of post-colonial planning in African cities such as Nairobi is largely attributed to colonial legacy, several shifts have taken place recently, with a number of countries in African countries partnering with Japan and China in planning and development projects. An outcome from such partnerships is the NIUPLAN. The section below analyses NIUPLAN's proposals on housing, service provision and transportation with the hope to understand how the current South-East partnership in planning is addressing the issue of informality and informal settlements attributed to past planning. The choice to focus on housing, service provision and transportation proposals is informed by their current state, particularly in slums and the link to past planning as earlier discussed. The analysis focuses solely on the general proposals and rhetoric's of the plan as most of the plan is yet to be implemented.

3. THE NAIROBI INTEGRATED URBAN DEVELOPMENT MASTER PLAN (NIUPLAN)

3.1 Introduction

NIUPLAN is a long-term development strategy for Nairobi, spanning the years 2014 to 2030. The plan was prepared by the Nairobi City County (NCC) in collaboration with JICA, as part of the Japan government technical assistance to Kenya. The plan preparation was responding to the longstanding urban challenges such as traffic congestion, environmental degradation and the continuously expanding informal settlements (JICA&NCC 2014). Consequently, the Plan hopes to accelerate sound and sustainable development, by enhancing access to services such as water supply, transportation, solid waste management, and to transform Nairobi to "an iconic and globally competitive city" (JICA&NCC 2014): p.6-12 Part 2). The geographical coverage of the plan includes both the official boundary of NCC

that covers about 700km2, and the greater Nairobi Area, which covers an additional 20km2 from the Nairobi City Boundary (see Fig 1 below). The inner grey part of Fig 1 below shows Nairobi's official boundary and the population density, while the surrounding area represents the additional 20km. The planning process started in 2012, ending in 2014 and consisted of a highly participatory process drawing participants from the public, private sectors, academia as well as the community. The JICA team formed the lead planning experts.

The final plan offers a general framework and proposals to guide development in several sectors such as infrastructure, environment, land use and human settlements, urban transport, governance and institutions. Key components of the plan document include a detailed analysis of existing social-economic, institutional and infrastructure conditions; development proposals and priority programs for specific sectors to be implemented in the short term before 2018.

3.2 NIUPLAN proposals on housing, service provision and transportation

3.2.1 NIUPLAN housing proposals

In regards to housing, NIUPLAN acknowledges the inadequacy of proper housing for a variety of income groups and especially low-income groups. The plan also identifies affordable housing, high rents, poor housing conditions and congested residential areas as some of the major challenges facing the housing sector in Nairobi. Accordingly, the plan suggests that government steps in to provide housing through the servicing and appropriation of residential land. It also proposes the densification of residential zones, the strengthening of institutions in the housing sector as well as the establishment of public private partnerships to enhance housing provision. Unlike in other sectors that have detailed proposals and action plans, there is very little in the plan dedicated to housing and particularly in regards to informal settlements. In fact, the plan deliberately left out the areas covered by informal settlements in the plan analysis and concept development. The JICA team cited incompetence in slum planning in addition to stating their mandate included planning of the formal part of the city (Field Interview, 2014).

The plan's broad proposal that government steps in to provide housing for low-income population fails to acknowledge the failure of past government housing schemes for the poor. The government through the National Housing Corporation funds and constructs low-income housing for public servants. However, rarely these housing reach the target beneficiaries. Public housing meant for low-income households has always gone to middle income households (Huchzermeyer 2008). A major challenge to low income-housing provision in Nairobi is the lack of affordable housing models options for the middle and upper-income groups. This vacuum in housing provision creates competition for housing produced for low-income groups (Ibid).

Though the plan calls for the government to provide land for housing, there is need to curb land speculation and reform housing finance and especially to meet the housing needs of middle

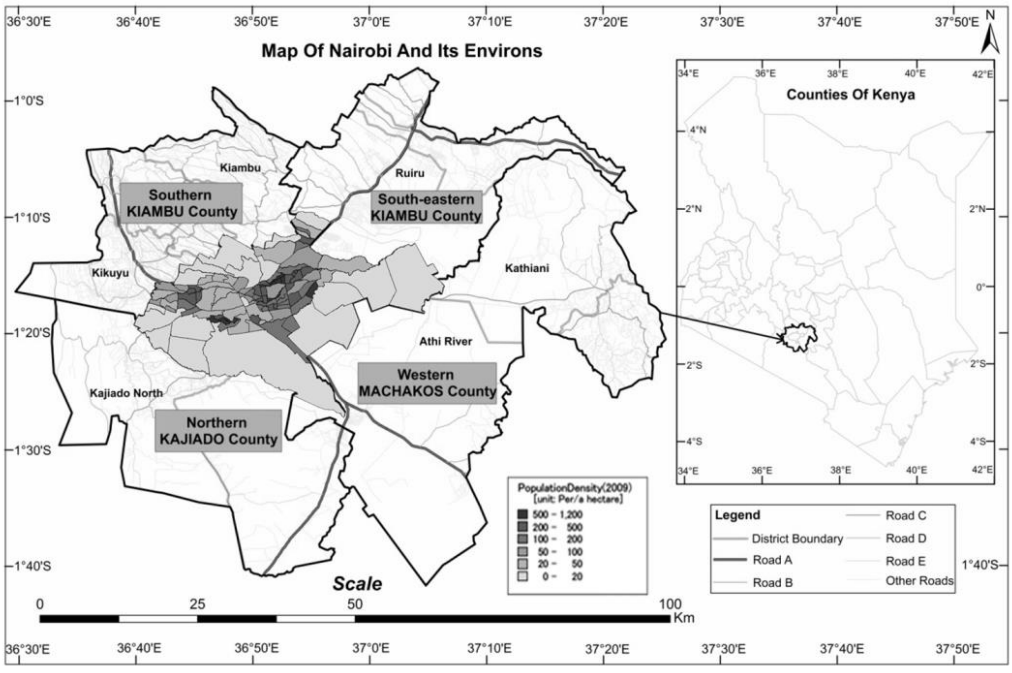

Fig 1: Geographical coverage of Niuplan and Nairobi population density. Source: adapted from niuplan, 2014

and upper income groups. The cost of housing production is quite high in the country owing to urban land speculation and high cost of capital. The current mortgage rate stands at over 15% in most commercial banks. A 2016 analysis done by the Centre for Affordable Housing Finance in Africa showed that a $10,000 house, at a repayment rate of $107/month within a twenty-five years period would be affordable to only 20% of Kenya's urban residents. The final cost would be over three times the initial cost totalling to $34,237 (Africa 2016). Additionally, the government needs to provide highly subsidized housing for those at the bottom of the income pyramid. Overall, NIUPLAN failed to offer housing solutions for the least well off and therefore unlikely to address the question of housing in informal settlements.

3.2.2 Service provision

NIUPLAN carried out a comprehensive analysis of select services such as water and sanitation, solid waste management, telecommunications, storm water drainage, health and school facilities. For the purpose of this discussion, I focus on schools, water and sanitation. These services are largely provided by private individuals in informal settlements who charge exorbitant prices for low quality services, sometimes even beyond those in the formal areas (Gulyani and Talukdar 2008). For instance, in 2009, water in the informal settlements cost over four times what it cost in the formal parts of the city at Kshs 45/M3 and Kshs 10/M3 respectively (Ogendo, Kamundi et al. 2009).

Water and sanitation

The plan aggregates the analysis for water and sanitation per the administrative Nairobi districts. Based on this analysis, there is a trend with districts where slums are located having low levels of service provision. For instance, Nairobi West consisting of Dagoretti and Lang'ata/Kibera districts has the highest number of pit latrines at 68%. Kibera and Kangemi slums are located in these districts. Similarly, Nairobi West and Nairobi East have the highest number of households relying on water vendors at 20% and 22% respectively. Mukuru slums and low-income residential estates are largely in Nairobi East. In addition to the disproportionate water distribution among the various districts, NIUPLAN identifies old water network and limited water sources as other issues limiting water and sanitation access in the city.

The plan offers general proposals like the replacement of water supply systems, the majority of which were constructed between 1950-1980 and haven't been replaced or expanded since then, thus limiting the capacity of water that can be supplied as well as contributing to system losses through leakages. Because the city does not have a direct involvement in the supply of water, and sanitation the plan recommends the establishment of a committee at the City County to liaise with Nairobi City Water and Sewerage Company (NCWSC), the body responsible for water and sewage management in Nairobi. In regards to informal settlements, the plan suggests that water and sewage management in informal settlements to be handled through on-going projects by World Bank and other institutions such as the Water and Sanitation Service Improvement Project (WaSSIP) and Kenya Informal Settlement Improvement Project (KISIP).

Schools

The Physical Planning Act, (1996), requires one primary school for every 5,000 people with the distance to the school not exceeding ½ km. A secondary school should also be provided for every 25,000 people and be located within not more than 1km radius. Based on this requirement, NIUPLAN establishes that Nairobi has a deficit of 443 primary schools and 77 secondary schools compared to the available 185 primary schools and 49 secondary schools.

As per the above criteria, NIUPLAN identifies the highest deficit of schools in districts to the East and South of the city such as Lang'ata and Kamukunji. Areas such as Westlands and Starehe have almost similar amount of schools as Embakasi in East of Nairobi which has over 2.5 times the number of school going children. Slum areas are also highly impacted. For example, areas like Kayole a low-income area and Mukuru Kwa Njenga a slum to the East of the city, have a deficit of over 15 primary schools and 5 secondary schools. Fig 2 below shows the distribution of primary schools within 5km buffer in relation to population density. The plan proposes the establishment of new schools in areas outside the 5km buffer.

Though NIUPLAN observes that services such as water and education facilities are underprovided in districts hosting slums, there are no specific recommendations for improving service delivery in slums. The plan recommends broad proposals using aggregate city demand projections. The close the plan comes to addressing deficiency

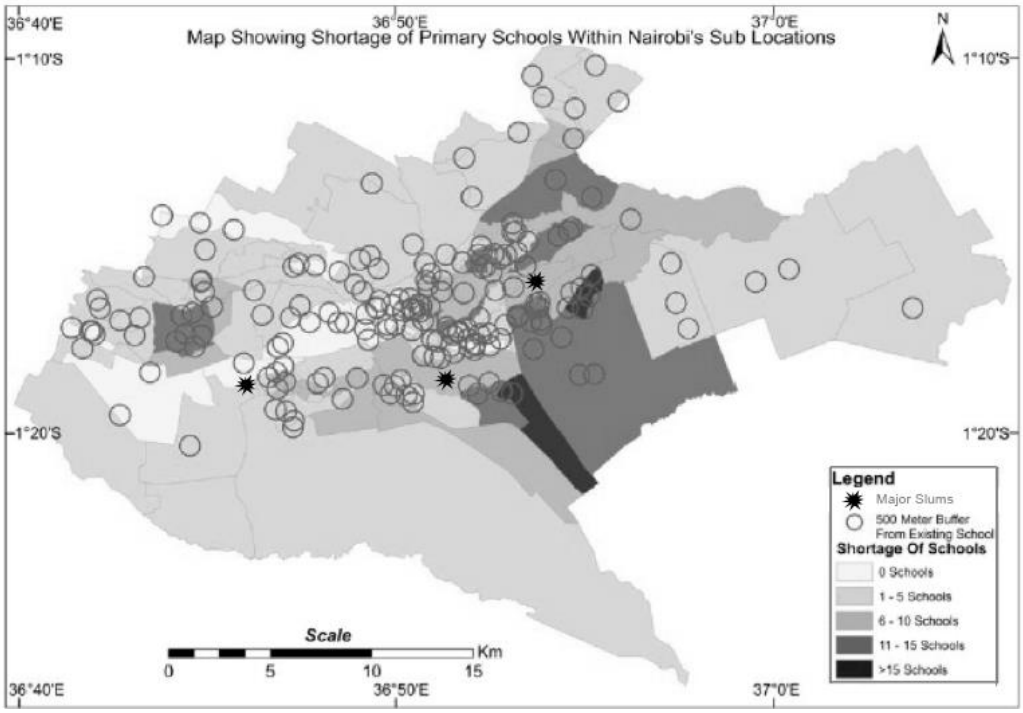

Fig 2: Primary school distribution in Nairobi in relation to Nairobi's major slums. Source: adapted from NIUPLAN, 2014

of services in slums is simply stating the need to extend services to informal settlements. While the official acknowledgment of the disparity and call to provide more services in these areas is a critical step towards making provision for such services, more needs to be done to close that gap. Given the magnitude of slums, they should be treated as special planning areas.

Again, the plan's proposals do not necessarily address the root causes of the service disparities, which include land tenure insecurity, poverty, and the lack of informal settlements recognition by public service providers. Service provision in Nairobi both during colonial and postcolonial era has been closely linked to formal housing policy and security of land tenure. Public services are mainly provided in areas that have land tenure and are formally planned. This criterium thus locks out slums and settlements that lack tenure security and are therefore termed informal or sometimes illegal settlements. Though some providers like water companies are taking steps to provide water in informal settlements, the inability to include slums in current plans undermines such efforts. Any well-meaning plan should thus provide guidelines for service provision in slums as well as advocate for their regularization.

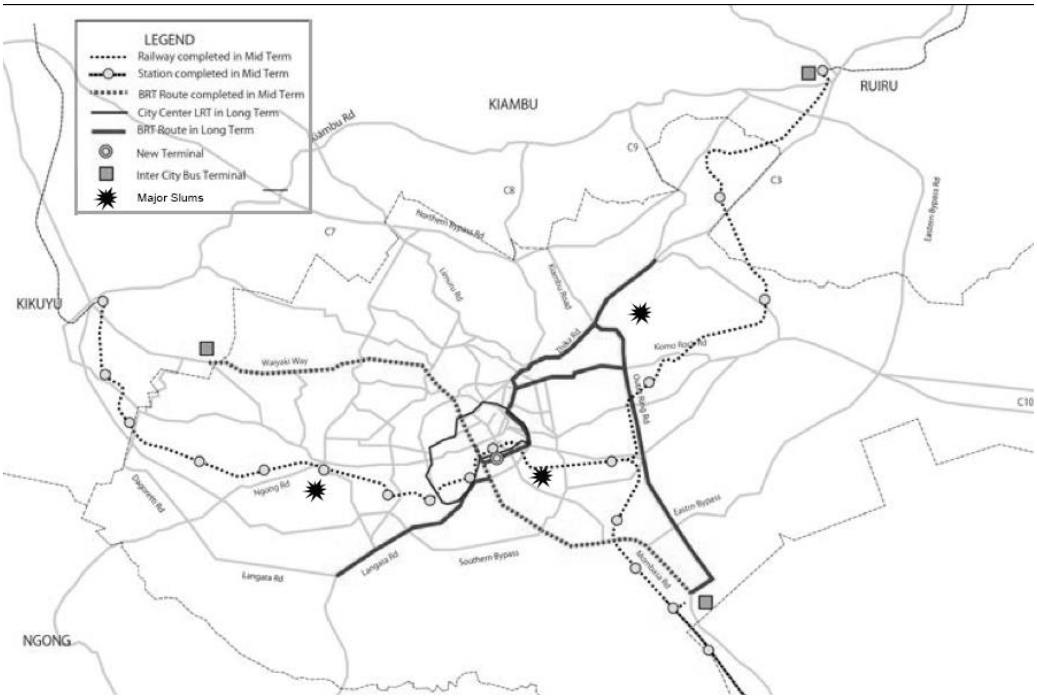

Fig 3: Proposed Public Transport (Railway, BRT and LRT) in Relation to Nairobi's Slums. Source: adapted from NIUPLAN, 2014

3.2.3 Urban transportation

NIUPLAN identifies the main challenges facing the transportation sector in the city as: congested CBD due to through traffic passing in the city and the location of all bus terminals in the CBD; insufficient public transit options; poor and limited Non-motorized Transport (NMT) networks. To address these challenges, NIUPLAN proposes several measures categorized in 4 broad areas: investment in public transport, Non-Motorized Transport (NMT), Railway and road network enhancement.

In regards to public transport, NIUPLAN suggests the adoption of Mass Rapid Transit (MRT) such as Light Railway Transit (LRT) and Bus Rapid Transit (BRT) along the 6 major lines leading to the city; staggering of work hours; the development of a bus terminal outside the city centre and; the movement of long distance vehicles outside the city to decongest the city centre among other measures. Further, the plan advocates for the expansion of some of the existing road network as well as the construction of new roads within the city to enhance the flow of traffic. The plan also proposes investment in NMT facility in the entire city with priority given to dense streets. In addition, it proposes the refurbishment of a railway system and commuter trains. Fig 3 below shows the distribution of proposed public transportation networks in relation to Nairobi's major informal settlements.

Theoretically, NIUPLAN's transport and NMT proposals provide strategies likely to impact the prospects of the less well off but not necessarily slum dwellers. Over 80% of Nairobi households have at least a member who regularly uses public transport (Salon and Gulyani 2010). Hence, the move to improve public transport through BRT and LRT may significantly benefit low-income populations, who are the majority users of public transport. These proposals however, rarely impact slum areas. The BRT, LRT proposals are made based on existing major transport routes, which do not pass near slums. Even those that do pass by, like the Light Rail, hardly are any stops provided in slum areas. Similarly, though investment in NMT networks is likely to improve the mobility of low-income residents by providing cycling and secure walking as an alternative to public transit, none is proposed within the slums. This is despite the fact that, over 65% of adults and about 96% of school going children in slums walk to work and school respectively (Salon and Gulyani 2010). Overall, the plan fails to specifically address issues of linkage and movement in slums, which lack proper accessibility within and to adjoining areas.

4.0 CONCLUDING THOUGHTS ON NIUPLAN AND PLANNING IN NAIROBI UNDER A SOUTH-EAST PARTNERSHIP

Current post-colonial planning in Nairobi is taking place under relatively different social, political and economic dynamics than it did during the colonial and immediate post-colonial era. Development or underdevelopment debates in African cities continue to be discussed in the context of colonialism and West-driven policies and practices. However, the entrance of East partners is shifting development relations and hence the development debate. In the face of emergent actors in South development, (Roy 2008:93), calls for the need to 'recalibrate' the 'Anglo-American accountability' to underdevelopment in the global South. She stresses the need to 'acknowledge the other geo-political vectors through which planning and development ideals are now transacted'. Taking that challenge, this paper uses the case of NIUPLAN to explore how the South-East partnerships are contributing to dismantling or reinforcing the social-spatial inequalities in the city of Nairobi.

The results do not provide much of hope. The plan failed to provide concrete measures to address the challenge of low-income housing, services and transportation in informal settlements as discussed above. In fact, the plan completely left out informal settlement from the analysis and concept development. The neglect of slums that house over 50% of Nairobi residents in the NIUPLAN process puts to question the ability of the South-East partnerships to address past development inequalities. Again, the claim that these partnerships are built on equal relations and seek to promote equitable development is questionable, particularly given JICA's ability to dictate what the plan should cover - for instance, the use of agreements (JICA versus Kenyan government) to exclude informal settlements. Such decision-making models resemble donor/recipient relations between the West and Africa. Watson (2009b) notes that one of the ways that colonial and imperial relations continue to express themselves is through patterns of inequality affecting what counts as expertise and knowledge. Hence, in my opinion the JICA-Nairobi city planning model does not differ so much from the Western and colonial development models. The 'foreign experts' in this case the JICA lead team choose which policy options to pursue just as in the case of colonial and West driven projects.

This calls for the need to ensure that the emergent development partnerships are truly committed to meeting the interests of the vulnerable through real democratic processes such as public participation and representation. Given the decision to leave out slums was taken in spite of the high level of stakeholder involvement, it is critical to ensure that the insertion of public voices as stakeholder views is not an act of power that occurs to legitimate the actions of decision makers. As it is now, it seems that the rights to determine who benefits, who is involved and what is included still continue to be the preserve of foreign imperial partners. Therefore, the key task for current critical theory is probably to elaborate how to actually make the voice of the local and marginalized in the African city count, given the deeply entrenched imperialist relationships in planning practices-between planners and communities, donors and recipients that imposes decisions on others as in the case of NIUPLAN. In fact, the case of NIUPLAN demonstrates that the problem may not be the geopolitical location or origination of ideas. Rather it may lie in the power relationships between decision makers as well as the system and context under which decisions are taken.

Overall the plans failure to address housing, transportation and service provision in informal settlements even under South-East partnership attest there is more to the current failure of planning in the South including Nairobi than colonial legacy and West planning approaches. This is not to deny colonial legacy and the continued influence of Western actors to Africa's development policy directed by institutions such as the IMF and World Bank. Rather, it's a call to begin to acknowledge and seriously grapple with contributions from the South city systems such as Nairobi that make them so vulnerable to manipulation. To see the failure and problems of planning in the South and Nairobi in particular not only as a result of colonial legacy and global North approaches but also as a result of the local cultural and organizational structures allows a new perspective - one that requires local planners and the state to understand their role in perpetuating social inequalities and segregation and hence position themselves to seek and to discover the opportunities for transformation of planning towards Justice.

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Using the natural system to achieve urban societal ambitions

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Across the world cities are expressing the need to develop in a resilient and climate robust manner. The need for healthy, adaptive and livable urban areas is increasing, as pressure in urban areas increases by demographic and climate change. To plan and design resilient urban areas new strategies are needed. This article elaborates on a new planning approach based on the metabolism of the urban ecosystem, a system-based approach. The approach focuses on the interaction between the socio-economic (urban) layer and the natural (ecological) layer and has been tested in various urban pilot studies. This article explores the effectiveness and applicability of different interventions in the urban ecosystem developed for three focal points: climate sensitive urban planning and design, nature based solutions in the city and planning of the subsurface. Examples of the measures are: vulnerability assessments of the natural and socio-economic layer of the urban ecosystem, design principles for multifunctional green in the city and linking the surface and subsurface in urban planning using planning support tools.

Concluding from the pilot studies, the natural layer of the urban ecosystem can provide services that help achieve the city's goals and societal ambitions. Nevertheless, several barriers must be overcome to enable integration of he socio-economic and natural layer to achieve societal ambitions in urban planning. It still proves to be difficult to raise awareness of the possibilities to create value, to define the indirect value of the natural layer and to bridge the gap in language and working manner between engineers and designers.

1. INTRODUCTION

World-wide the need for healthy, adaptive and livable urban areas is increasing, as urban areas are growing in size and population. The coming decades the pressure in urban areas increases by demographic and climate change (UN (2014) ST/ESA/SER.A/352). Resilient cities and climate robust cities are goals, which are often heard in urban planning, but not yet achieved. Hence, there is an urge to change the profession of urban planning. To deal with these ambitions, a vision is needed on how to design smart and healthy cities. This paper proposes a strategy called Smart Urban Planning. It is based on the concept of the metabolic city, which is often heard in the process of the New Urban Agenda (Sijmons et al. 2014). It is encountering the circularity of the urban ecosystem and focusses on the interaction between the socio-economic layer and the natural layer within the city. The socioeconomic layer reflects the need of the society. The natural layer of the urban ecosystem can provide services that help in reaching societal ambitions. Examples of these services are water storage, temperature buffering capacity for soil energy, filter pollution from the air and reducing local air and ground temperature (heat stress). In addition, not using the natural layer in a sustainable manner can result in shortage of freshwater, urban flooding, soil subsidence, decrease of water quality, (future) problems that cities are facing nowadays or need to tackle (Meyer 2013). Hence, analyzing, understanding and using both the natural and socio-economic layer is important for the design of a healthy and climate robust city.

This article elaborates further on this possible new planning approach using the outcomes of several research projects in practice. Different measures are described that enhance the integration of the natural layer into the practice of planning and design ascertaining that the natural layer is effectively used for the design of resilient cities.

2. THEORETICAL BACKGROUND: USING THE NATURAL LAYER OF THE URBAN ECOSYSTEM IN PLANNING AND DESIGN

Though urban practice is already encountering the socio-economic layer of the city, the benefits of

incorporating the natural layer of the city in planning and design is not common practice yet. The natural layer is defined as the world's stocks of natural assets which include geology, soil, water, and air in both surface and subsurface. Since we are building houses, roads and parks on the natural layer of the urban ecosystem without understanding or taking into account its functioning, additional costs are made or value is not used to overcome or prevent failures (Alberti 2008). If urban planning is taking both the socio-economic and natural layer and its relation into account, so called system engineering, one is encountering challenges and opportunities of the ecological layer enabling to reach city goals and societal ambitions. For example: planning buildings in certain locations and with specific measures could lead to a natural cooled area with a healthy micro climate next to the sea, which is not threatening the new build houses. It is from this natural layer that humans derive a wide range of services, often called ecosystem services, which make human life possible.

Ecosystem services of the natural layer can be divided in four categories: 1) provisioning services (e.g. availability fresh water, energetic content, food); 2) regulating services (e.g. attenuation capacity of the subsurface, soil bearing capacity, storage capacity); 3) cultural services (e.g. archaeology); and 4) supporting services (e.g. biodiversity and habitat) (Groot et al. 2015).

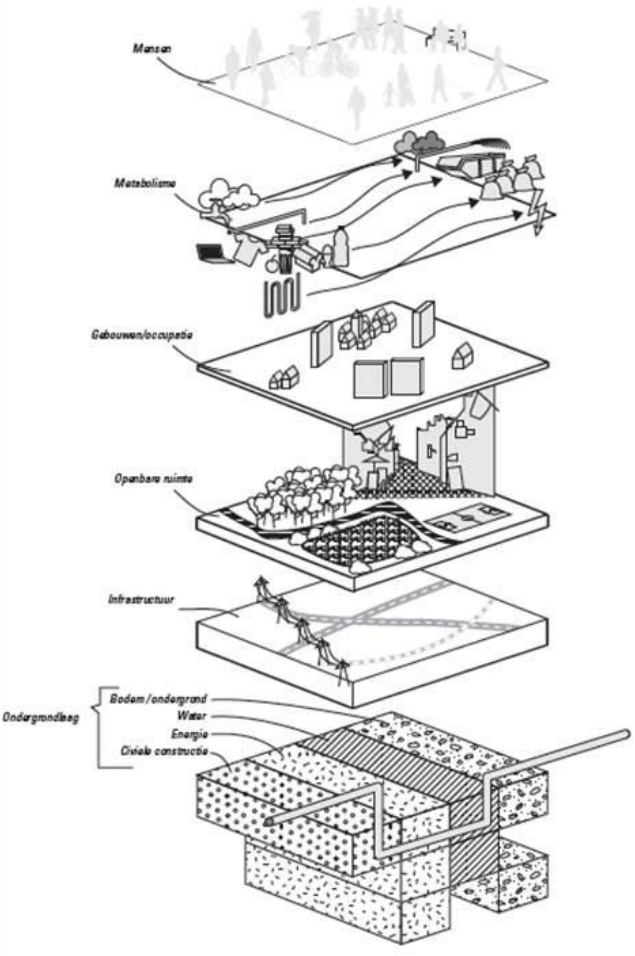
Depending on the characteristics of a location (e.g. soil type, elevation, groundwater level) and the objectives of the stakeholder(s), different ecosystem services can be demanded and obtained in urban planning and design. Besides the required services, also additional services can be obtained, creating surplus value when including the possibilities of the natural layer at an early stage in the planning process. Consequently, innovative planning and design measures are developed to both support an integrated approach and enhance sustainable use of the natural layer in the urban environment. These measures are developed by both academic institutions and urban practitioners and tested via pilots (in an urban context). Additionally, this method uses design as a tool to combine different disciplines. This article elaborates on the effectiveness and applicability of different measures developed for three focal points: climate sensitive urban planning and design (using green and blue infrastructures to reach city ambitions), nature based solutions (for sustainable and surplus value flood defenses) and planning with the subsurface (sustainably using and maintain its functions and surfaces).

3. CASE STUDIES: DEVELOPING MEASUREMENTS TO DESIGN WITH THE NATURAL SYSTEM

This chapter gives an overview of the different measures that have been developed using different (urban) case studies. First, an overall introduction will be given. What is the focal point about? What are main challenges to overcome? And what opportunities could be used in practice. Second, the applicability of the focal point will be explained using case studies.

These are cases in which the applied knowledge institute Deltares (the Netherlands) has been involved. All cases make use of participatory processes, though the process has a different focus in every case study. Additionally the cases are not only cases from the Netherlands, but are also pilots from abroad in a different urban context. Consequently, the applicability of the method is tested in a broad sense.

Figure 1. The urban ecosystem (TU Delft, Deltares)



3.1 Climate sensitive urban planning and design

The first focal point is focusing on climate sensitive urban planning and design. Nowadays, a shift from blue print planning towards more integrated planning can be seen in urban practice

(Batty 2013).The city can be seen as a complex and dynamic system, also called an urban ecosystem. It consist of several layers, in which people, animals, the production of energy and other dynamic infrastructures are connecting the static layers like infrastructure and subsurface. Figure 1 gives an overview of the different layers of the urban ecosystem. Still, it is necessary to find harmony between the natural and the socio-economic layer in both strategy-making on the regional level and urban design on the local scale. At present we hold little or no account in urban planning of this system thinking. This results in a depletion of the urban system. Therefore, awareness is raised that we have to take a circular instead of a linear way of planning. Climate sensitive urban planning is based on an approach in which the urban ecosystem is planned and designed as a whole is seen.

Yet it remains difficult to apply this integrated approach in practice by the current sectorial approach. The communication between different disciplines and sectors remains difficult. In addition, each discipline often has its own objective and interest. Additionally, it is difficult to change the planning method that has been there for decades to a more integrated and dynamic planning method. Hence, the city is often not yet seen as an integral system.

But achieving the objective of integrated urban planning and design is not the only result (the design) that is important. Also the process influences the level of an integrated design. The urban ecosystem is extremely dynamic on a various scales by different actors, functions and land use. By integrating various disciplines at an early stage, we can work together on an integrated urban plan. This focal point has been tested in several projects, but only one iconic project will be explained and compared to the other focal points.

One of the research projects in which this approach has been tested more in depth is Adaptive Circular Cities (Gehrels et al. 2015). This project was a joint project of Dutch research institutes, local stakeholders and urban practice. The objective of Adaptive Circular Cities was to develop innovative combinations of ecosystem services taking into account the maximization of the added value to the urban environment. Optimal combinations should simultaneously contribute to climate change mitigation, climate change adaptation and resource efficiency. Case studies that have been used are: a new urban development in a former industrial area of Amsterdam; the large scale redevelopment of the central part of the city of Utrecht and (re) developments in the city of Almere. Other cases are located in Rotterdam and Ho Chi Minh City. The research project has been working together with local stakeholders and they were able to take a closer look at the different local urban contexts. Consequently, the outcome of the research project is twofold. On the one hand it delivered tailor made advice for these different cases. On the other hand principles for other cities on both city level and street level to design have been developed, because of the representativeness of the chosen cases. Project results are also generically usable for other cases and transferable via principles. Hence, these principles can be seen as design patterns combined with ecosystem services that integrate both the natural and socio-economic layer of the city.

3.2 Nature based solutions in the city

The second focal point is focusing on delta-cities. They have been and are popular cities, because of their fertile land, good location according to transportation and availability of fresh (river) water, soil and sand. However, these are also very vulnerable cities considering the impact of climate change, with high risks for flooding and sea-level rising. To encounter this, hydraulic structures are built. These structures are often hard, not flexible

Figure 2. Design principles for climate sensitive urban planning (Adaptive Circular Cities 2015)

and one-purpose/ value structures. By using natural elements such as wind, currents, sediment transport, flora and fauna in designing a hydraulic engineering solution, additional benefits for livability, nature, recreation and the local economy are created (Balla et al. 2015).

The benefits of utilizing natural processes are that it is cost-effective as one is working with nature instead of against, it "uses" natural processes, such as sediment transport or vegetation growth which are for free, it also creates additional functions. Instead of only creating a flood defense system (climate proof), a flood defense system with functions like nature development, recreation, education, improved water-quality and air quality can be developed by effectively using the natural layer and its processes. In this way several objectives and ambitions can be met with one "action" (climate adaptive, health and livability). A current example of urban nature based solutions is the project of Building with Nature in the city. Both the city of Rotterdam (NL) and Dordrecht (NL) are used as case study in the project (van Geest et al. 2016). Both cities are located along the river in the Rhine-Muse Delta. Though the socio-economic and natural layer of both cities differs from each other, general principles for the design of urban tidal parks have been developed. These are parks along the urbanized riverfronts that strengthen the relation between the river (nature) end city (people) in a positive manner. Several urban nature based solutions that have been developed are:

- Creating soft fore banks (e.g. using willows or other vegetation) to mitigate wave impact, so that the dike behind the fore bank does not need to be raised or strengthened as much;
- Measures to improve the water quality and biodiversity: hanging and floating structures;
- Piers for fore bank formation and ecological biodiversity vegetation; and
- Tidal-park, as flood protection measure and ecological recreation/education park.

Figure 3 shows a visualization of an urban tidal park, which is made by an urban designer. The image can be seen as an outcome the process between an urban design office, the planning department of the municipality and the academic world. By trial and error the design principles for the use of the natural system for achieving urban ambitions like hydraulic infrastructures, climate mitigation, recreation, etc.

First, to incorporate the concept of nature based solutions in urban planning and design it is necessary to work together with urban practice. Knowledge that has been developed in by academic institutes should be translated into principles that are useable by urban practice.

Nevertheless, there is a gap between the languages of the two different worlds. A researcher will not have the same design skills as a designer, but at

Figure 3. Tidal park in Rotterdam to create value for both people and biodiversity (Urbanisten, 2015)

the same time the designer has a different way of working than a researcher. Bridging the gap between the two worlds should be one of the top priorities for the implementation of Urban Nature based solutions. Hence, academia and planners should work together in research projects to actively work on the issue of transferring knowledge between the two worlds. Second, time and money are challenging in the world of soft engineering. Urban planning and design is a world that has to move fast and make decisions on urban plans all the time. Changing the way of working is difficult and challenging. Hard engineering constructions that have been proven to work effectively and are less expensive will be preferred instead of soft engineering constructions. Also, soft engineering constructions have to develop over time and won't have the same esthetics as hard engineering from the beginning. Though soft engineering has to develop over time, the benefits and added value still has to be discovered by urban planners and designers. Though more research still needs to be executed on the functioning of urban nature based solutions, it has been proven that there is added value. The link between people and nature in the city can be improved by nature based solutions like tidal parks along the urban river, green roofs and local food production. For example food production in tidal parks could both improve biodiversity and social cohesion on a local scale.

3.3 Sustainable integral management of the subsurface

The third focal point is focusing on an integrated and sustainable approach of managing the subsurface. Next to demographic changes, climate change and the need for resource efficiency, continue to increase the pressure on the available space and the complexity to meet the needs in urban areas. One of the solutions is to make better use of subsurface space and its functions. Unfortunately, much of the subsurface value is already lost, because space is inefficiently used due lack of spatial planning, promising (combinations of) soil functions are not employed or damage has occurred due to unexpected effects or interferences. To avoid this, sustainable integral management of the subsurface is needed.

The main goals for sustainable and integral subsurface management are: 1) to use the subsurface in a sustainable way within urban spatial planning (using its benefits, avoiding problems) and 2) to manage and maintain the (urban) subsurface and its functions. For example: when the strategic goal of a city is climate change adaptation. This can be translated to a task: take measures to avoid pluvial flooding; this can be achieved by increasing the volume of a sewer system but also by using the water storage capacity of the subsurface. Both the sewer system and the water storage capacity of the subsurface contribute to the strategic goals and can be considered and managed as an asset.

The functions that the subsurface provides are considered as valuable assets. Methods for integral subsurface management consist of 3 different aspects:

1. Subsurface functions and boundary conditions. These depend on the ambitions and goals, which functions of the subsurface can be employed and/or need to be maintained within an area. Consequently, the opportunities and

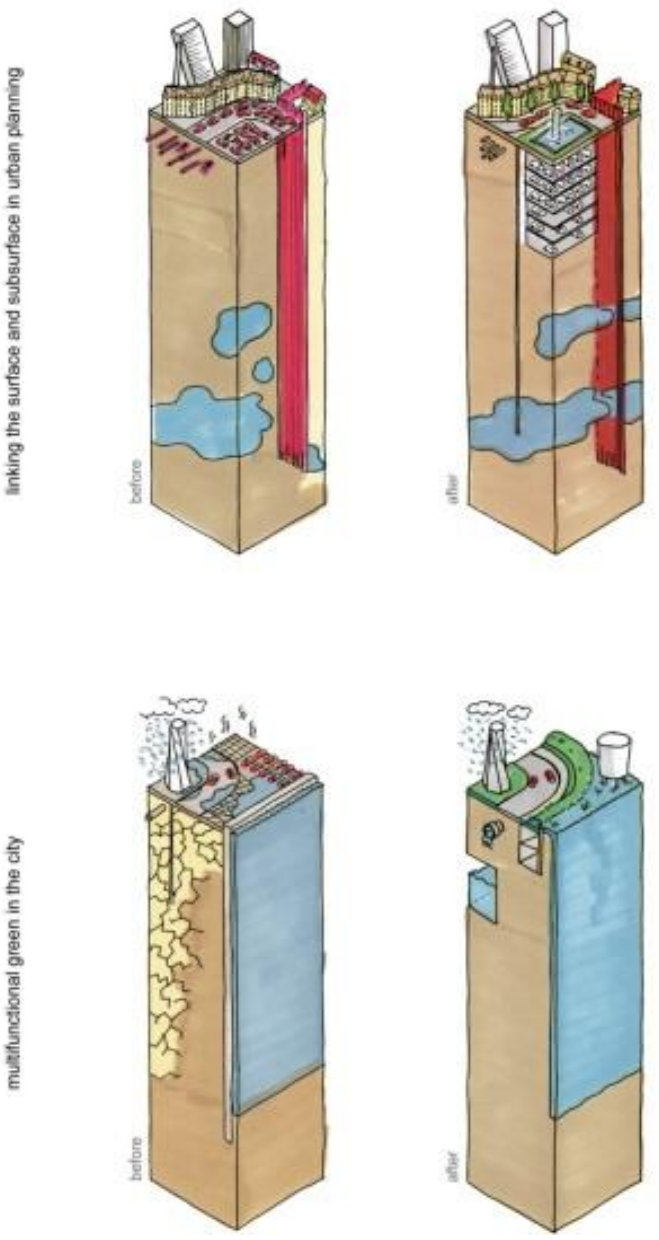


Figure 4. Designing the urban ecosystem by linking the socio-economic and natural layer (Blauw & Maring 2016).

challenges that the subsurface offers and poses need to be mapped, using area knowledge and available subsurface data and models. Different methods have been developed to systematically analyze the potential of the subsurface for the urban system. Examples of these methods are: SEES (System Exploration Environment & Subsurface) (Hooijmeijer, 2013) and Resources methodology for subsurface (Smit, 2007).

2. Risks: Both, risks appearing from subsurface for projects and land use functions and risks for the functioning of subsurface functions need to be assessed. Also the complex and inseparable subsurface system and urban system are examined to assess the effects of interferences.

3. Related costs and benefits are assessed to be used in the processes of making alliances and decision making. Additional factors due to the slow-responding system like irreversibility and scarcity need to be taken into account here as well.

To obtain a sustainable and optimal use of the subsurface two important transitions are needed:

1. An integrated approach is required. To reach this, the system needs to be taken into account instead separate objects (sectoral approach). The subsurface is a system, containing anthropogenic assets and natural assets with (in)direct value for the urban environment. These functions can co-exist, compete for underground space, or interfere with each other, leading to positive or negative effects.

2. For a sustainable approach, from lifecycle to land cycle. Often asset management considers the life cycle of the asset, an asset having a specific life time and is considered from construction to disposal. This is not the case for functions of the subsurface. These functions are just there and when maintained well, for "eternity". Therefore they should be considered using a land cycle in which they perform their role.

4. DISCUSSION

An important challenge is raising awareness of the possibilities in gaining value and decreasing costs when managing the natural layer sustainably. Within spatial development the natural layer is often not taken into account or seen as a black-box with its advantages and disadvantages, where we just have to deal with. When considering the natural layer at an early stage of planning and design, conscious decisions can be made how to optimally use and deal with this natural layer and its opportunities and challenges. Much value can be gained and costs can be avoided when it is recognized that the natural layer is a system that influences positively and negatively the socio-economic layer in reaching it societal ambition.

Another challenge is defining the (indirect) value of the natural layer. This is both needed for balancing performance, costs and risks as well in the communication to other parties concerning the importance of sustainable subsurface management. Factors playing a role are the degree of (ir) reversibility, possibility for multifunctional use and scarcity of the function.

Additionally, it is hard to quantify the effectiveness of the delivered services by the natural layer, and thus its "real" added value. It takes more time to implement measurements, because of the innovation phase it is right now. Current planning approaches are oldfashioned and stuck and therefore it is difficult to integrate a new approach. Also the effects of soft engineering and system thinking are unknown and investors are therefore difficult to convince of the benefits. Hence, a solution could be found in the process.

It is necessary to include different stakeholders from the beginning of the planning phase. In addition, during stakeholder involvement it is important to bridge the gap in language and the way of working between engineers and designers. This could be done according to the so called "living labs". As seen in the examples of Adaptive Circular Cities and Building with Nature in the City, combining all stakeholders, planners and academics during the process it could lead to a broadly accepted result in which both the plan is developed according to scientific parameters and executed in reality.

Another barrier to overcome is difference between the academic world, aiming for in depth research, and urban practice that aims to execute plans without spending too much money and time. How are we going to combine the fast and commercial world of practice together with the academic world that takes time, and thus money, to conduct in depth research?

5. CONCLUSION

By integrating the socio-economic and natural layer, many societal ambitions can effectively and sustainably be achieved in urban planning. The natural layer often offers unknown added value,

which can easily be addressed, especially when it is considered at an early stage in urban planning. All governance, engineering and design should be included from the beginning of the process. Hence, for this system based approach, it is stressed that working in interdisciplinary teams creates easily added value for urban strategies and plans. The negative effects of climate change on urban plans can be prevented by working with nature, acknowledging its opportunities and recognizing its threats. Additionally, urban plans could become less labor-intensive and could be maintained by local inhabitants themselves. This could improve social cohesion on a small scale. At the same time soft engineering solutions can improve the quality of the urban living environment, which again will impact the development of the neighborhood and/or city over time in a positive manner. By using natural elements such as wind, currents, sediment transport, flora and fauna in designing a hydraulic engineering solution, additional benefits for livability, nature, recreation and the local economy are created.

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In search of new urban planning education and research formulas for future cities

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This paper presents research and educational urban planning projects based on an interdisciplinary approach, including innovative elements used in conducting research on the built environment. Their common aim is to search for a new perspective into city development and the challenges resulting from changing conditions.

1. INTRODUCTION – THE CHANGING ROLE OF PLANNERS AND PLANNING EDUCATION

Dynamic processes taking place in urban spaces cause changes in the role of urban and regional planners. Education and applied research methods are a key to the future design of the cities we need. To influence planning practice there is a need for a new formula for research and for the education of future practitioners. While studying urban processes, an understanding, the ability to perceive and analyze the phenomena determining the changes, is required. In the era of rapid urban development, it is important to think outside the box and to encompass a wide range of competences allowing solutions to complex urban problems. Future planners are the ones to decide on the shape of future cities, but while performing this task they need to respond to the needs of their residents. Nowadays it is not only urban planners who decide on the development of cities but also a number of other actors, therefore it is necessary to support the improvement of interdisciplinary skills in education and research.

2. NEW URBAN PLANNING EDUCATION AND RESEARCH FORMULAS

This paper introduces new planning education and research formulas taking as case studies two recent urban planning projects both dealing with research and education. Gdansk is a hub for both projects which are based on cooperation with multiple stakeholders and include innovative elements in conducting research on built environments. Their common aim is to search for a new perspective on city development and the challenges resulting from changing conditions. The common denominator of both projects is that they use an interdisciplinary approach, involving not only the planners, but also specialists in other sectors. Furthermore, in order to fill the gap between theory and practice, stakeholders from the non-university sector such as local NGO's, business and public authorities representatives should be involved. They all provide an opportunity for the involved parties to exchange experiences, and propose a new approach to the training of future urban planners. Both projects being platforms for exchange, concentrate on local problems involving local research teams. They always have an international perspective and combine knowledge built out of different experiences, integrating the academic community and researchers at different levels of their career, including students, PhD candidates and senior researchers.

3. MENTOR & STUDENT RESEARCH LAB

The Mentor & Student Research Lab (abbreviation: MSRL) is an ISOCARP programme that combines research, field work and collaborative design. It has been organized twice and the MSRL second edition research was focused on the Baltic Sea Region, considered a multidimensional urban phenomenon, with Gdansk acting as a hub for the research teams. The programme became an ISCOARP platform for research promoting the collaboration of professionals from all over the world, graduate and PhD students, by bringing together the mentors with a local research team to share experiences and propose strategic recommendations to strengthen sustainable urban development. The idea of the MSRL, with the core theme Vibrant Urban Solutions

Figure 1. MSRL teams; Source: author Agata Hinca

for Baltic Cities, started three years ago during the first edition: Urban Transformation, held as a side event for the ISOCARP congress, which at that time was organized in Gdynia. It was the first time the results of these programme were presented. Since then many of the organizers' thoughts and reflections, remarks made by the participants and comments from the observers have resulted in continuous improvements. Today the programme may be considered an innovative formula for research collaboration as a result of the new work model that was created. After all, the three years have brought the involvement of more than 20 organizers supported by 3 supervisors, with more than 100 participants including PhD students and 10 mentors leading the teams.

3.1 Project goals

An academic education entails numerous needs corresponding to the presented programme. First of all, it gives the opportunity of working together with experienced researchers from all over the world while integrating local academia. What is worth mentioning is the possibility of bringing together both the practitioners and the theorists within a common research platform with students and early-career researchers, to establish a common ground where youth and ambition meet with experience, professionalism and methodology, to discuss urban issues.

Besides the research, methodological and educational goals which are the most important for the MSRL, this model of collaboration has three main aims, which were also defined by the European Framework of Qualifications, including in particular:

1) Technical, including development of the ability to use new technologies, which gives the possibility of working remotely between people from different universities. For many of the participants involved it is not only their first time working on scientific research, but also a new experience which requires self-discipline and dealing with the challenges resulting from distance working and collaborating.

2) Integrative, mainly related to the elements of integration within academia, as well as to intercultural exchange and development of a network of scientific cooperation between the universities involved.

3) Social, understood as the development of not only the knowledge and skills of all the actors working within the programme, but also the social skills resulting from teamwork, which is so important in the world of research.

3.2 Relevance of the topic

The transformation which Polish cities have undergone started after the democratic transition, of which the 25th anniversary took place in 2014. There was and still is an urgent need for an interdisciplinary discussion concerning perhaps the most significant issue that influences the quality of our life, namely space. The anniversary of self-governance provided a great opportunity to think of how the Tricity (Gdansk - Sopot - Gdynia) has changed in the last 25 years and to ask what it will look like in the next 25 years. It is important to realize that in the post-war period, Gdansk underwent a unique transformation: from massive destruction to recent fast urban development and most recently to spectacular public and private investments, thanks to which the city can aspire to the role of a metropolis (Obracht-Prondzynska, 2014). This occasion, as well as the ongoing public discussion, became an inspiration to establish a research platform and start the first edition based on the core theme of the MSRL programme – Urban Transformations, as well as for the undertaking of research projects by students and mentors.

During the first edition, the research groups were searching for answers to the question of the direction in which the Tricity and its surrounding areas should develop and whether it is an example of sustainable development. One group decided to research smart

infrastructure for waterfront cities and chose Gdynia, a Polish harbour city and a part of the Tricity, for the case study. The outcome of their work was a set of proposals divided into groups: transport, basic supply infrastructure, social infrastructure, public order and protection, and economic infrastructure. Another one analyzed European cities in terms of the basic aspects of mobility such as bicycles, mobility plans, car-sharing, parking policy, bus on demand etc. Their next step was to conduct research into mobility in Gdansk. There was one area of research which focused on a comparison of the Baltic cities before and after the changes of 1989. The analysis of the transformations that affected the cities after 1989 was to indicate possible directions for interventions that should be made by the authorities to ensure that the cities develop in the best possible way. The study consisted of gathering and analyzing data from domains such as space, city branding and identity, transport, economy, society, administrative systems, legislative systems, as well as identifying crucial problems and working on selected aspects in detail (Appenzeller 2016).

These are only examples of the research project that the MSRL teams have been working on so far. However, the last one mentioned above became an inspiration for the second edition where the task for the research teams was to share experiences and make strategic recommendations to strengthen sustainable urban development initiatives for the Baltic Sea Region at international, regional and local levels.

The groups focused on finding multifunctional spatial solutions to render Baltic cities and communities more sustainable through the concept of ecosystem services. One group was searching for creative solutions for waterfront cities in the context of climate change. The groups took up topics concerning the identity of the Baltic cities with great interest. Therefore, one research project prepared guidelines for Middle East cities damaged during the war based on the Baltic cities destroyed during World War II, in the context of the process of rebuilding, architecture and urban design. Moreover, the MSRL research was also related to social aspects such as the differences in culture of urban planning management where multicultural coastal cities were compared.

3.3 Process and tools

During the three months of research work the groups, supervised by ISOCARP mentors and led by early-career researchers, established a common ground where youth and ambition met with

Figure 2. Inspiration for the second edition; Source: MSRL materials

Figure 3. Project timeline; Source: MSRL materials

Figure 4. Work process; Source: author Agata Hinca

Figure 5. Project results - publications; Source: MSRL materials

Figure 6. Interiors of court yards in the historic district of Gdansk; Souce: author Joanna Szechlicka

experience, professionalism and methodology to discuss urban issues. Each so called "project actor" had a specified task to fulfil during the three months of the programme.

Mentors who answered an open call to join the programme, were asked to specify research topics from the proposed core themes. They were obligated to supervise a team of their own young, inexperienced researchers and to support PhD student teams with their skills and knowledge. On the other hand, students who decided to apply to join the initiative were supposed to be actively involved in international research work, which consisted of three workshop meetings and most of all online work and cooperation both with mentors and other participants. These, somewhat experimental methods required responsibility for all the work from each member of the group. It would not have been possible without the active involvement of the students. The most important modification during the second edition of the programme concerned PhD students who were the most important project actors, while becoming a "key" between students and their mentors. The aim was to provide an opportunity to master their methodological skills and teaching methods by conducting international scientific research. They were responsible for leading the group of students by supporting them with their knowledge and ideas as well as assisting and managing communication between the mentor and the research group (Obracht-Prondzynska & Rusin, 2016).

Also worth mentioning is the fact that this programme brought valuable benefits to everyone involved. For mentors, it was a chance to lead and shape urban or architectural focused research under their guidance and of their own design. Moreover, it gave the opportunity to guide a dedicated team of PhD candidates and students who valued their academic and professional input. The aim of the programme was also to invite mentors to participate in the preparation of a report that addresses the relevant issues for the host city (Gdansk). It gave students a chance to complete international work with the support of practicing urbanists and architects. Furthermore, all participants could expand their knowledge of the design process with a good chance of publishing internationally as well as obtaining research and professional skills.

3.4 Outcomes and recommendations

The programme has designed and implemented an innovative modality - attractive, flexible and dynamic to produce studies on the contemporary city in a

relatively short time with an interesting final product. It provided an opportunity to bring together both professionals and students of different disciplines related to the study of the organization of cities. Twice, for 3 months, five groups of students from Polish universities, supervised by the urbanists from different parts of the world, worked on research projects devoted to the challenges cities are facing, focusing their attention on the Tricity and referring to both the problems and the good practices in foreign countries. However, the most important fact is that a few groups went one step further, drawing conclusions and working out proposals ready to implement in the urban fabric. From almost all of the research, it is possible to learn a lesson and find recommendations for future urban planning. The most spectacular outcome are the three reviewed publications, although the most popular is the Public Space Planning and Design Manual, as a user-friendly handbook which consist of many recommendations providing a holistic approach to planning for public space, that is applicable to almost any city on any scale, from a small village to a megalopolis (Kreps & Rusin, 2014).

The example of the MSRL programme and its results emphasizes the enormous meaning of transformation in architectural and spatial design training, workshops as new method of research and learning as well as the positive effects of international collaboration between participants at different educational levels. Professionals and professors are eager to work with fresh student minds on the basis of partnership. Young students are pleased to work with experienced professionals. New opportunities are within reach.

4. PROJECT "(CO)URTYARD" AS PARTICIPATORY RESEARCH IN URBAN PLANNING

Project "(Co)urtyard" is a project aiming to prepare a civic concept of the development of the courtyard in the historic downtown area of Gdansk. The inhabitants of the quarter, before deciding whether to take responsibility for the area closest to them – to lease the yard from its owner, the city - were able, together with the participants, to elaborate solutions from point of view of the functionality, visual form and management possibilities. The project is a bottom-up initiative supported by the Gdansk Municipal Property Management Agency. A great advantage of this project is that participants were able to work out feasible solutions that can be implemented. During the conceptualization of the project the Design Thinking method was used as a useful tool for participatory design processes.

4.1 Project goals

The above mentioned project is not only an example of participatory research and educational initiative, but at the same time it answers real life problems and its outcomes are being implemented to transform the courtyards. Therefore, there are several goals of the project, answering different needs and dealing with their different aspects:

1) research goal, conduct participatory research by scientists involved in the project who form a multidisciplinary team,

2) educational goal, develop hard and soft skills and competences of the project participants: students, PhD candidates, representatives of NGO's, academia and business,

3) social goal, support the development of civil society, including stakeholders involved in the project, most significantly residents of the quarter

4) methodological goal, encourage use of wider range of participatory methods in planning and spatial management than previously used in spatial policy of the City.

4.2 Relevance of the topic

Changes, which occurred in Central and Eastern European cities after the socio-economic transformation of 1989, are significant as both the physical structure of the cities developed and the quality of life improved (Kamrowska-Za□uska, D. & Szechlicka, J. & Mrozek, P. 2015). In the last decade the involvement of communities in planning has increased considerably (Kamrowska-Za□uska & Lorens, 2013) but there is still a need to change indifference and apathetic attitudes inherited from the former system and for all the stakeholders to share responsibility for their neighbourhoods. The city of Gdansk is making a considerable effort to regenerate public spaces. Special attention is being given to the streets of the historic downtown area of Gdansk, although the backyards of the urban quarters are still wide open spaces, mostly devastated, filled with garbage, parked cars and "holes" left by unfinished archaeological excavations.

This project is already the second edition of the Design Thinking project of courtyard revitalization. For a pilot edition in 2014 – the most challenging area was chosen for which a model solution was proposed. The project itself was not implemented in the proposed form though it initiated social change in all the courtyards of the area of the Main

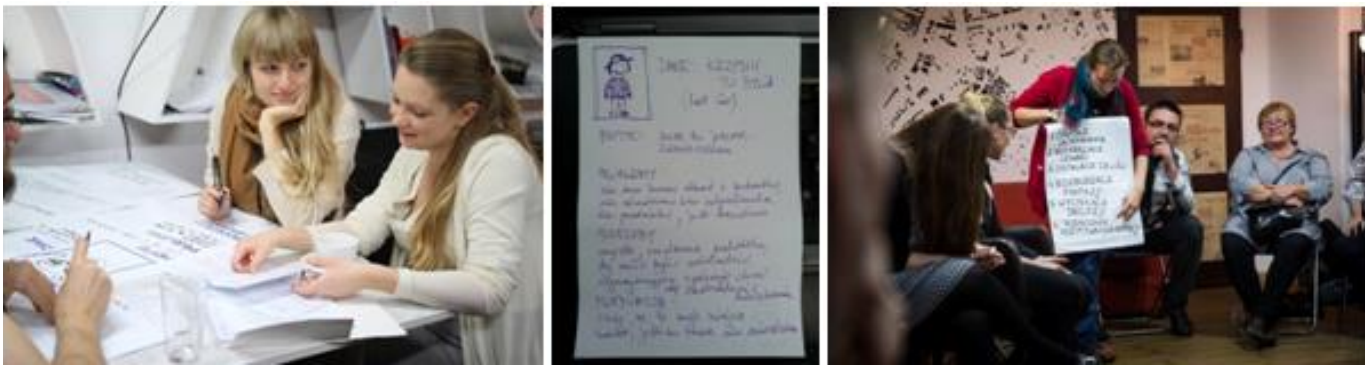

Figure 7. Persona building process; Source: author Joanna Szechlicka

Figure 8. Five steps of Design Thinking process; Source: Stanford d.school

Figure 9. Codesign process; Source: author Dorota Kamrowska-Zaluska

Figure 10. Project results; Source: Design team

Town. Recently, shortly after completion of the pilot project, City Hall introduced several new funding schemes to support revitalization of the courtyards in the historic downtown area of Gdansk. These new tools make it possible to prepare a comprehensive project of revitalization. The conditions required to access these funds is for a residential community to take responsibility for the area - to lease or buy it at a preferential rate. This is the only way for the Gdansk Municipal Property Management Agency (GZNK) to issue commissions for preparing a project and to finance construction and redevelopment of the courtyard. Furthermore, when communities come to consensus and sign a lease agreement, it opens further possibilities of financial support (up to a total of approx. 30 000 euro taking into account the different funding schemes).

During meetings with the GZNK, residents raised concerns about the fact that the lease must be taken on without the knowledge of how the yard will look after revitalization and how it will be managed in the future. It is a stalemate for both sides: GZNK funding can't be used without a prior declaration of will and the community fears a lack of control over the future shape of the courtyard, so they are not eager to sign it. Another problem reported by stakeholders, is how to manage such a courtyard which would be leased by 14 housing cooperatives. The abovementioned situation was a starting point for the "(Co)urtyard" project.

4.3 Process and tools

It is very important to stress the interdisciplinary character of the project, the involvement of different disciplines, as well as the transdisciplinary involvement of all four sectors: public, NGO's, academia and business, as well as participants at different stages of their careers.

While working on the project we went through the process of Design Thinking (DT), which is mapped in the 5 steps used by Stanford d.school including: Empathy – Define – Ideate – Prototype – Test (Brown T. & Katz B. 2009). DT with its strong emphasis on empathy and UX, allows one to understand users and other stakeholders – their needs, expectations, context and then to define the problem from the users' perspective. Further investigations allow one to find an answer to how the needs of stakeholders are to be met and the problems solved. The ideation phase stimulates both individual and team creativity in order to find a number of solutions to be prototyped and tested with users.

DT aims to develop the most suitable solutions through an iterative approach. Often there is a need to come back to one of the earlier steps which turns out to be incomplete or even not justified: going back to prototyping, ideation or even to defining problems may be required. It causes transition of process in the loop. There may be a need to pass through the stage of empathy if it turns out that a vital stakeholder was not asked for an opinion or important questions were not answered (in line with Ok2Fail principle). During all the steps of the process several different methods and tools were used, including creative ones such as a map of empathy, 'Lotus Blossom' and 'Attribute Matrix', Disney Brainstorming Method, the Business Model Canvas or mood boards. They were combined with traditional methods and tools used in planning fields.

4.4 Outcomes and recommendations

Design Thinking, as a strongly defined methodology, systematizes workflow. At the same time implementation of Design Thinking created restrictions in the design process, sometimes not giving enough of the flexibility needed in a specific project situation. A failure acceptance approach by the participants throughout the whole process and the iterative form of Design Thinking is appropriate in solving real life problems.

In the course of the project its most important goal was achieved – a civic concept of the development of the courtyard was prepared. Participants took part in a real-life process of participatory design which ended in implementation of the project. At the same time it was a challenging project as participants were not only learning new methods of participatory design but also using them in an actual project with actual users of the space. They learned not only to answer the needs of users but to co-design with them, to listen to all stakeholders but also to be aware of their own role as an expert.

The interdisciplinary nature and the different career stages of participants were both assets and challenges of the project. They allowed the creation of a comprehensive solution, taking into account different aspect of design, but they also prolonged the initial phase as a common platform of understanding had to be created. At the beginning there was a need to establish a common language for all the participants representing different disciplines such as architects, planners, civil engineers, economists and sociologists. The project was especially challenging as participants were only facilitators of the process and couldn't fully

influence outcomes such as: consensus building and readiness to sign the agreement, which were vital factors for the project's implementation.

The project aimed not only to change a single courtyard but more importantly, to help initiate social change in all the courtyards of the area of the Main Town. A participatory approach will strongly influence the type of space created in the future: if, as an outcome of development, a semi-public space (open to everybody) or a semi-private space (fenced and used only by its residents) will be created. A town quarter will look very different depending on whether priority is given to car-parking or to other uses.

5. DISCUSSION AND CONCLUSION

Both projects have provided not only educational benefits but also put participants in contact with a particular problem. Analyzing and interpreting the situation allowed them to gain knowledge and improve the skills needed to solve real life problems. Both projects put a strong emphasis on the work process: in case of Co-urtyard project on applying a user-oriented approach and Design Thinking methodology and in the case of the MSRL to teach participants how to design research and how to apply different scientific methods, which in both cases was as important as the final solutions and the projects themselves. They both taught participants how to work in the sphere where different disciplines cross and bring together participants with different backgrounds and professional experience. Moreover, both initiatives are not only about solving specific problems in space but could also be a voice in the discussion about common responsibility for shaping urban space. This approach yields a variety of innovative findings and recommendations, as well as planning and design solutions.

Summing up, it should be emphasized that both projects received numerous positive opinions from both the participants and the observers. The MSRL teams, working from different places, managed to create research projects on Baltic Cities bringing lots of recommendations for their future urban projects. In the Co-urtyard project the expected aims were achieved, consensus among stakeholders was built, a development project for a courtyard in the historic downtown of Gdansk was created and the project itself is going to be implemented. Both organized projects became a unique opportunity to express everyone's opinions, share ideas and create interdisciplinary teams. It showed a new quality of approach to the planning process and allowed the implementation of new educational formulas.

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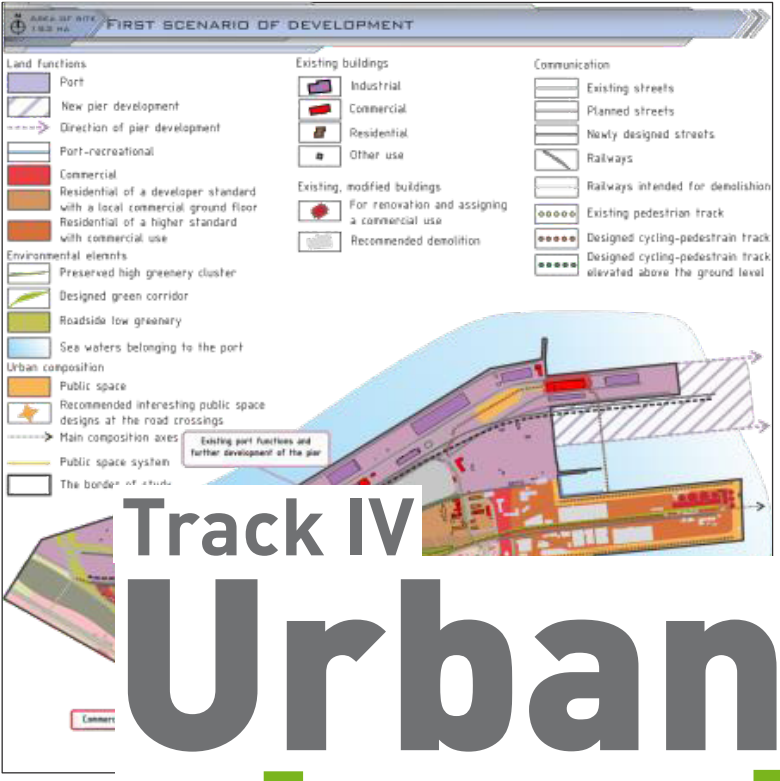
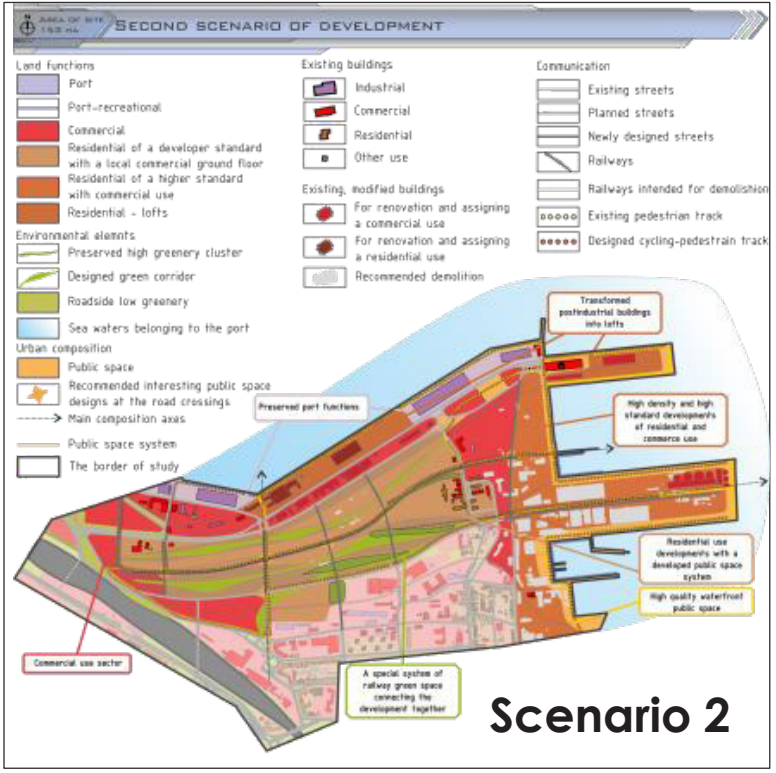
52ND ISOCARP CONGRESS

12 - 16 SEPTEMBER 2016
DURBAN, SOUTH AFRICA

"CITIES WE HAVE VS. CITIES WE NEED"





Scenario 2

Track IV

Urban planning and policy making in times of uncertainty, fragility and insecurity

Międzyrzecze

Słupsk

Final Report

by Jacob Babarinde (Papua New Guinea), Elizabeth Reynolds (England/Australia), Geci Karuri-Sebina (South Africa)

1. INTRODUCTORY PARAGRAPH

All cities experience uncertainty, insecurity and fragility. Uncertainty means 'not able to be relied on; not known or definite'. Fragility implies 'easily destroyed or threatened.' Insecurity means 'a situation that is liable to change for the worse; not permanent or settled.' Conceptually, therefore, the domain of Urban and Regional Planning is to be found at the core of the interface linking the three subsystems of uncertainty, fragility and insecurity. Accordingly, Track 4 was segmented into three sub-themes, namely: Sub-theme 1: Master-Strategic-Futuristic Planning and the Property Development Process; Sub-theme 2: Climate Change, Sustainability and Infrastructure Services; and Sub-theme 3: Spatial Analysis and Environmental Risk Modeling. Over three days we heard from urbanists from 13 countries, on subjects ranging from socio-economic vulnerability to scenario planning. The 3-day presentations were assigned to the three sub-themes, as follows:

Sub-theme 1: master-strategic-futuristic planning and the property development process

This sub-theme featured 10 paper presentations. First and foremost, every city has a life cycle that has serious implications for the Congress theme (Cities we Have vs. Cities we Need). The city's life cycle may be enhanced and synergized through a diligent application by all land developers and the planning authority of a novel and holistic 56-matrix land development model (Kohlhepp, 2012). Since planners hold the key to approving or rejecting development applications, the first keynote [1] focused on the necessity for the entire planning profession to review the development control apparatus for purposes of achieving city liveability and sustainability. This may then pave way for a new development-planning theory to fill the gap in the existing eight planning theories that are inadequate for explaining and analysing the challenges faced by cities pursuing sustainable development goals and protection from insecurity, fragility and uncertainty. In the real world, however, planning sometimes becomes litigation [2], but success can be achieved through a new balance, in which all stakeholders collaborate in the planning process from the very beginning, including planners, inhabitants and entrepreneurs. This requires a new interpretation of the roles of these stakeholders, especially governmental bodies and planning authorities [3]. An open-ended process, that does not work towards a fixed end goal but leaves sufficient flexibility for the unknown, can accommodate the future [4]. Meanwhile, we need to face the reality that the world polity is now rigorously shaping the debate on cities, which underscores the important contributions of stakeholders, such as intergovernmental organisations [5], small business enterprises (SME's) [6], each country's constitution and legal framework [7], in facilitating economic growth in cities. For these stakeholders to perform creditably, our existing building technology [8], strategic planning [9] and post conflict development [10] strategies must be overhauled modernized.

Sub-theme 2: climate change, sustainability and infrastructure services

Five papers were presented under this sub-theme, including the second keynote delivered by a UN representative [11]. Some highlights of the paper included the guiding principles for City Climate Action Planning that had been developed through a year-long collaborative process under the auspices of UN-Habitat and launched at the Paris Climate Summit in December, 2015. Other presentations examined issues relating to spatial resilience and adaptation to water sensitive planning [12] the framework for resolving water issues in spatial planning [13] and a taxonomy of barriers to implementation of smart energy projects in Europe [14].

Sub-theme 3: spatial analysis and environmental risk modeling

Five papers were presented under this sub-theme. The highlights included presentations on, the determination of social and spatial vulnerability of a place from potential natural hazards [15], and

[1] Jacob Babarinde [2] Laura Schatz [3] Miranda Schut [4] Caroline Bos and Justyna Karakiewicz [5] Michele Melchiorri [6] Eloise Rousseau [7] Herbert Musoga and Rose Musyoka [8] Peter Niue and Joshua Munge [9] Joanna Prigara [10] Muhammed Pakoz and Ahmet Gün [11] Faderr Johm [12] Heldegard Rohr [13] Zhejing Cao [14] Farnaz Mosannenzadeh, Daniele Vettorato, Simon Pezzutto, Maria Di Nucci [15] Jublee Mazumdar, Saikat K. Paul [16*] Jeremy Gibberd [17] Basudatta Sarkar, Haimanti Banerji and Joy Sen [18] Pablo Pessoa, Gabriel Rego, Raiza Fraga and Taina Ferreira

two papers by the same author: sustainable goods and services [16*] and sustainable waste streams [16*], both focusing on measures that the urban environment may put in place to measure ecological footprint and city sustainability. Two other papers presented under the same sub-theme focused on an assessment of socio-economic vulnerability using select indicators [17], and the contribution of risk relations to urban planning practices with regards to floods and other natural disasters [18].

2. KEY OBSERVATIONS

- Planners and planning authorities hold the key to approving or rejecting development applications. However, the definitions of 'development' and 'development control' in Planning Law are outdated and need revision and widening to reflect the fuzzy nature of the stages and tasks in the holistic land development process

- As of today, none of the eight planning theories we use is suitable for explaining the dynamics of the life-cycle of cities and the process for achieving city liveability and sustainability. It is high time that a think-tank was set up by the planning profession to explore the desirability of a new development-centred planning theory

- Scenario planning could be a useful tool for cities and is being used by Amsterdam municipality and the National Environmental Assessment Agency in the Netherlands

- At a micro level, businesses and communities are trying to plan for their future in a complex and uncertain world - planners can help at this local scale because they are public sector specialists

- Big data of the kind used in Rio can collate and analyse data such as soil structure, meteorology, socio-economic indicators and infrastructure - created layered maps that can enable powerful predictions

- Food safety and security are of increasing importance with the Milan Pact bringing together 58 cities to embed food into planning legislation

- Terrorist attacks on urban areas have tremendous consequences, yet the cost of improving building resilience can be prohibitive. It is likely that safety and security will become a more common consideration in designing urban places, with the Abu Dhabi Safety and Security Manual acting as an early example

- Conflict induced urban migration is also increasing and cities need to be flexible in adapting fluctuations in population.

- Guiding Principles for City Climate Action Planning have been released by UN-Habitat, these are: Ambitious; Inclusive; Fair; Comprehensive and Integrated; Relevant; Actionable; Evidence-based; and Transparent and Verifiable.

- Sometimes acceptance of a risk is the best way to prepare, like in the Netherlands where the Room for the River initiative allows space for flooding at more than 30 locations

- Social vulnerability indexes are another tool that can be used to identify and mitigate the impacts of natural disasters.

3. RELEVANCE OF TRACK 4 TO THE SOUTH AFRICAN CONTEXT

- The presentations that focused on models for more sustainable and liveable development through a more robust planning system gave a sense of the presumption of an enabling institutional framework to deal with the multi-dimensionality required

- It would be difficult to improve cities through existing planning systems without being able to integrate delivery, both vertically and horizontally. This is not just about what needs to be done, but by who and how it will be done. How does Planning grapple with the institutional actors and arrangements required to implement, even if we had the perfect plan?

- South Africa is increasingly dealing with planning issues through the courts. However, international research questioning the primacy of private versus public good in legal decisions should alert us to particular concerns about such an approach

- New "agent" configurations for doing planning – including trans-disciplinary teams and networks of professionals

- The international experience is showing interesting evolution in planning epistemology and methodologies which require consideration and debate in Africa where we are still possibly using quite an old planning "toolbox". Yet,

there should be some caution in adopting tools uncritically as there are deep contextual considerations attached to such tools

- The strong link between resource efficiency and planning strategies and approaches is important to note for the South African context

4. CONCLUSIONS / QUESTIONS FOR REFLECTION

- How can the traditional planning processes such as development controls, master-planning, etc., be made more relevant and responsive to modern city planning?
- What new ways of working and networking may planners need in order to deal with these levels of complexity?
- What new tools would be needed for achieving liveable, sustainable and smart cities?
- What paradigm shifts, including new planning theories, may be needed in the planning profession?

5. SUMMARY

In order for the recommendations made to be able to see the light of the day, planning has to resolve some critical institutional and ethical challenges, including the following:

- Devolution of resources: money, skills
- Low priority of urban planning, institutional rigidities, and inadequate support to local level
- Corruption, influence of power, entrenched interests and other forms of conflicts of interest
- We need strategies for planning in transitional and changing environments. Urban Planning in transitional and changing environments needs to be managed by developing strategies that mitigate emerging challenges and harnesses the opportunities presented, e.g. Gaza needs vision for the future in transitional periods
- Planning processes are often lengthy and complex
- The designer as planning professional needs to integrate quality of design with 'collaborative practice' skills including mediating design, communicating, disseminating, enlisting stakeholders, inviting diverse views, moderating, and adapting, e.g. for mixed-use developments
- Multiple- and trans-disciplinary nature of complex issues, collaborative / networked approaches between various professionals and actors (participation)
- Flexibility in masterplanning and policy analysis as common approaches to planning
- Pragmatic development control systems (responsive, adaptive)
- Filling the gap between spatial transformation and international agreements, particularly at the city level
- Settling litigations arising from clashes between the public interest and private rights

6. SOME IMAGES (TO ADD VALUE TO THE SUMMARY)

a) Urban and regional planning sits at the interface linking uncertainty, insecurity and fragility

b) Assessing and mapping vulnerability will enhance city managers' knowledge and awareness of the complexity

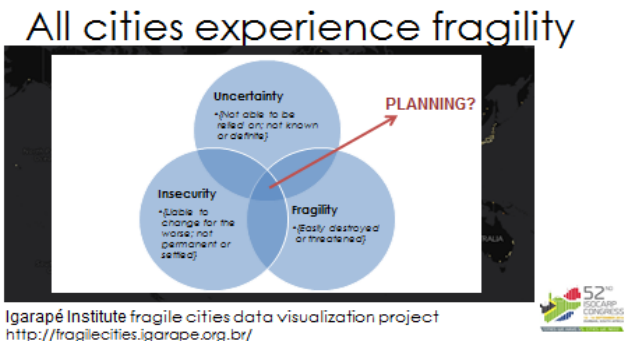
c) The tools and methods for dealing with the complexity are multifarious and multi-disciplinary in nature

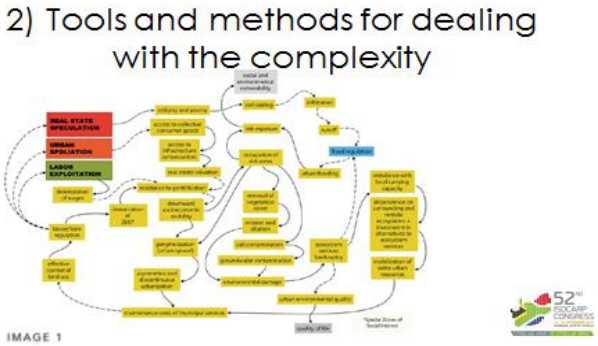
d) Analysing and breaking down the complexity into manageable sub-systems has become crucial because safety and security risks undermine development and growth and harms city liveability and sustainability

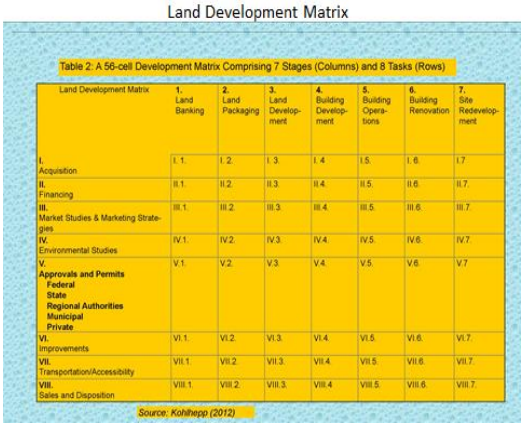
e) Viable solutions must consider multilateral and legal strategies (approaches) that are

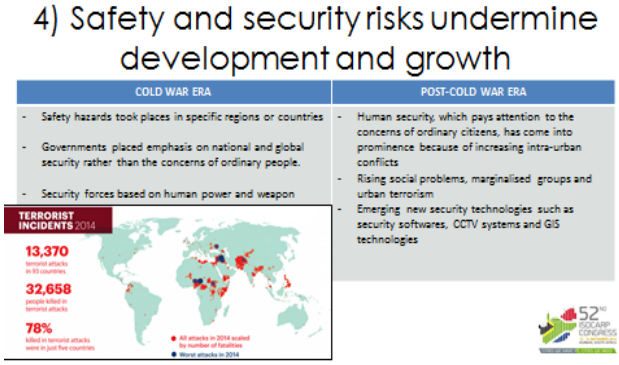
f) flexible and

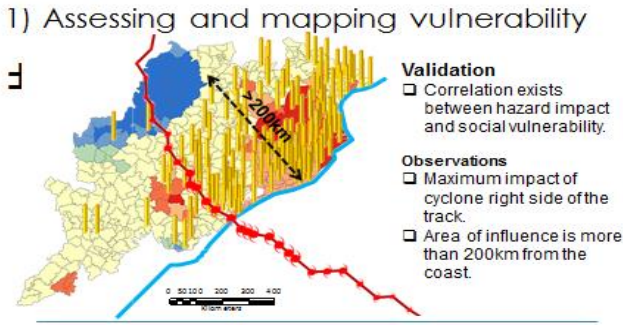
g) mirror the dynamics of the life cycles of the cities we need.











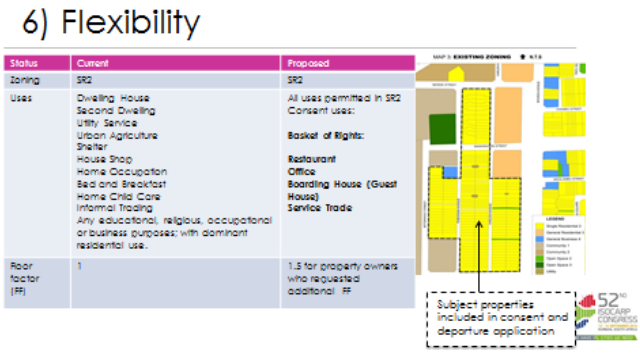


Figure 1. Some images

Application of a holistic land development model for city sustainability: a flux of messy situations extending the frontiers of planning theory

Jacob Adejare BABARINDE, Papua New Guinea University of Technology, Papua New Guinea

Existing planning theories are ineffective in explaining and analysing contemporary challenges facing cities in pursuit of sustainable development goals due to insecurity from terror attacks, crimes and general uncertainty. It is argued that diligent management by planners, who hold the key to approving or rejecting development applications during the land development process, which forms the backbone of much of development control functions and planning legislation around the world, has the capacity to transform existing chaotic cities into liveable and sustainable human settlements that we need. The planning profession has witnessed at least eight procedural theories but while these planning paradigms have enjoyed an historic epoch, they generally lack the tools that planners can effectively utilise in managing the development control system for city liveability and sustainability. Consequently, a new planning theory (paradigm) is needed to transform planning practice to a new level that effectively captures the land development process throughout the life cycle of the built environment. This paper adopts a recently developed real estate (land) development matrix (Kohlhepp, 2012) to model a hypothetical housing project in Lae City, Papua New Guinea, South Pacific. As a pedagogical tool, the 56-cell matrix can help planning students, practising planners and urban policy makers understand the process, risks, and value creation in land development, thereby easing the smooth transition of existing chaotic cities that we have to liveable and sustainable cities that we need with the proactive support and due diligence of land developers and other members of the land development team.

1. INTRODUCTION

This paper consists of an investigation of the challenges facing the application and enforcement of development control and how the land development process can be used to synergize development control for achieving liveable and sustainable cities. This calls for an overhaul of the existing development control apparatus to accommodate smart planning standards and building regulations that are socially, economically and environmentally sustainable. The author argues that planners, who hold the key to approving or rejecting development applications, are better positioned than other built-environment professionals in diligently managing the land development process that forms the backbone of much of development control functions and planning legislation around the world; hence, planners hold the key to transforming existing chaotic cities to liveable and sustainable human settlements that we all need. Development control (i.e. planning control or development management) is the element of the British system of town and country planning (from which most Commonwealth countries developed their own system) through which local government regulates land use and new building. The concept relies on a "plan-led system" whereby development plans areformed and the public is consulted. Subsequent development by the developer requires planning permission, which is granted or refused with reference to the development plan in the form of a material consideration, according to the British Town and Country Planning Act 1990. Occasionally a planning application is continued until certain things are made clear i.e. reserved matters or subject to an Article? which requires the developer to sign an agreement with the Local Government to the effect that they, the developers, will meet initial set-up costs for infrastructure provision which they can claw back as and when the development begins to function and generate local rates (taxes)?

A development proposal can also be called in by the appropriate Secretary of State for his decision especially if the proposed development may have ramifications for others. This can be done no matter what the Local Authority intends to do. It is quite a complex area of the development control system.

The case study used in this paper is a hypothetical housing project in Lae City, PNG, illustrating how the land development process plays out in the life cycle of a building project that can literally be replicated by cities that we need. Papua New Guinea operates a dual land tenure system comprising 'alienated land tenure', which is land owned and controlled by the State (3%) under specific legislation, and 'customary land tenure' accounting for 97% of all land in the country. Customary land is held by tribes, clans and land groups and its ownership is dictated by local customs and traditional values and beliefs (Power, 2001; Dixon, 2007). Customary land tenure system had existed well before the advent of the early colonizers in the early 1800s (http://revealinghistories.org.uk/colonialism-and-the-expansion-of-empires.html, accessed on 21 May, 2016). In 1884, Germany declared a Protectorate over north-east New Guinea, where Lae is situated. In 1914 Germany surrendered its colony of New Guinea to the Commonwealth Troops, a colony that was administered by a British Military Administrator until 1921 when Australia took over (Amankwah, Mugambwa and Muroa, 2009). It was the Australian administration that tried to protect customary land from alienation, but the problem till today is that there are no proper land use guidelines for customary land in PNG because it is governed by customary law (Dixon, 2007; Gilberthorpe, 2007). This is a hindrance to any meaningful operation and enforcement of PNG's Physical Planning Act 1989 used to enforce development control on both alienated land and customary land in the country.

The era of 'laissez faire' approaches prior to the emergence of 'formal physical planning' in most countries around the world, witnessed cities that had become 'containers of problems' such as overcrowding, 'anomie', pollution, congestion, disease and crime (Cozens, 2016). However, PNG's Physical Planning Act - No. 32 - 1989 has established a comprehensive mechanism for physical planning in Papua New Guinea at the national and provincial levels. It provides powers for planning and regulation of physical development. The main instruments are provincial development plans, local development plans and subject development plans. The Department of Lands and Physical Planning (DLPP) oversees all matters regarding land registration and physical planning. However, the DLPP has been described by the Minister of Lands as the most corrupt civil service department in PNG (http://lands.gov.pg/Services/Governance/Complaints_Desk.html (accessed on 8 May 2016). In the same vein, the tool used as Land Information System (LAGIS) in PNG has been found to be fraught with problems, although recommendations have been made for its improvement (e.g. Tumare, Babarinde and Tagicakibau, 2015). The Physical Planning Boards and the local authorities are in charge of development control. This includes obtaining licences and permits, completing required notifications and site inspections. As is the case in Australia (or the UK), the lawful occupier of any land or buildings will not only have title to their land (a freehold, leasehold, or licence from the actual land owner), but also requires planning title for any buildings on the land, or uses to which the land and buildings are put.

As defined by the British Town and Country Planning Act 1990 (legislation.gov.uk, accessed on 27 May, 2016), "development," means "the carrying out of building, engineering, mining or other operations in, on, over or under land, or the making of any material change in the use of any buildings or other land." For the purposes of this Act "building operations" include (i) demolition of buildings (ii) rebuilding (iii) structural alterations of or additions to buildings; and (iv) other operations normally undertaken by a person carrying on business as a builder.

It may be worth noting that the Crown does not require Planning Consent: Local Authorities that are planning authorities, by definition, also simply give themselves a planning consent "nod" for any work they do themselves e.g. roads, lighting, and so forth. Finally, Statutory Undertakers also do not require to make planning applications but rather merely make a reference to the relevant authority about what they intend to do. This latter group can include, for example, cable network providers. The reason for this latter is to ensure that such developers do not get caught up in the long delays which are part and parcel of planning determinations by Local Government. For example, a professional colleague and friend who is an architect-planner in Britain recently designed four townhouses in Edinburgh; the first planning application was withdrawn and the second went in two months ago. Everything had to be digitised by the City but as they have a staff deficiency, this took several weeks. The consultation period therefore has had to be delayed and instead of completing public consultation and approving or rejecting the planning application this month

it has now been delayed until February next year 2017. There are circumstances where this would be completely unacceptable but as the process is ineluctable (statutory), what can one do?

Certain types of development are specifically excluded from the definition of development, such as routine building maintenance and repair, small extensions including garages, porches, etc., but within certain specified space limits. Many categories of minor development are classified by legislation as "permitted development" (PD), which avoids any need to engage with the planning system and can be undertaken by land owners as a right. Almost all planning permissions are granted conditionally and enforcement action can also be taken to secure compliance with the conditions imposed. Unauthorised development can be the subject of a "stop notice" if there is an urgent need to prevent further harm. A grant of planning permission relates to the land or building(s) concerned. With a few rare exceptions it is not specific to the person, organisation or firm, who obtained the permission (Planning Guidance, KJM Design, accessed on 27 May, 2016). However, the enforcement of development control measures in many countries is facing some bottlenecks that are accentuated by the fact that developments do change with time and so do crime risks, which liveable and sustainable cities should reduce to the barest minimum (Cozens (2016). There may be additional approvals required, for example, "Listed Building Consent". This latter would require passing the application on to another bureau for their approval or rejection. In fact, there is no assurance that even "permitted development" can get round this obstacle. This justifies the adoption by the planning profession of the holistic land development model to synergize the old and weak development control apparatus that has the potential of being used as an effective tool for achieving liveable and sustainable cities.

This paper is divided into five sections. After the introduction in the first section, section 2 presents the research problem and contributions to knowledge. In section 3, the method is presented followed by the findings in section 4. The conclusion in the last section outlines the major implications of the findings.

2. NATURE OF THE PROBLEM AND CONTRIBUTIONS TO KNOWLEDGE

A general review of previous studies on the benefits of development control and the challenges militating against the successful enforcement of development control measures reveals some serious criticisms that need to be addressed if our existing cities are to become liveable and sustainable. Most of these criticisms surround the cultural relevance, environmental appropriateness and economic affordability of the planning standards and building regulations that constitute the backbone of many cities' development control system, with particular regard to the developing world.

Dissanayake (1987) acknowledges that development control has significant benefits. First, it forms an integral part of planning practice and is the basic means by which the state intervenes to regulate the use and development of land in order to implement local and national planning policies. Second, it is the part of the planning process in which members of the public come into contact with local planning authorities. However, there are complaints that sluggishness discourages development; that the complexity of development control is excessively costly; and that its nature stifles initiative (Amos, 1980; Dissanayake, 1987). Consequently, Dissanayake (1987) argues, development control is not appreciated by the general public mainly because of the restrictions it imposes on the aims and aspirations of land developers. Although state control of private development in most cities of the world is basically aimed at achieving the objectives of safety and better health in order to create an improved environment for the benefit of the community, it is argued that as the role of the state expanded and the extent of its intervention increased, the definition of the 'environment' subject to planning control has changed over time. From being wholly concerned with the physical form and content of development, 'environment' now embraces the social and economic consequences of development (Dissanayake, 1987). For example, development control has been used to implement planning strategies for different purposes, such as minimising the negative impact of economic growth, checking the menace of market forces, ensuring social equity and supporting economic growth (Litchfield & Darin-Drabkin, 1980). Consequently, Dissanayake (1987) contends, development control has become a tool that is sometimes used to achieve its original objectives of safety and better health sometimes to implement planning strategies and in some cases to do both. The problem is, since development control continues to regulate the use of land while planning strategies have widened in scope, development control on its own has proved incapable of meeting additional demands.

Since development control is used to implement planning policies, which are normally reflected in

planning legislation, physical development plans and other associated planning documents, its failure to achieve development planning objectives may be due to the pursuit of inappropriate policies, or the application of inflexible standards and regulations, or both (Koenigsberger, 1975; Rivkin, 1978; McAuslan, 1985). Consequently, many have argued that development control practices are inappropriate, ineffective and inequitable in their operation in most cities of the developing world. They also argue that developing countries stand to benefit little from the transplanting of regulations that have evolved in other countries with differing social, political and economic climates. Furthermore, it is argued that planning agencies in most developing countries lack the manpower and financial resources to implement and enforce efficient and effective development control measures, while the issue of corruption amongst some elected officials, bureaucrats, land officers and planners has actually accentuated the problem (e.g. http://lands.gov.pg/Services/Governance/Complaints_Desk.html, accessed on 8 May 2016). Interestingly, most of these challenges also exist in some western countries, such as the UK, if only at a relatively small scale.

Many previous studies (e.g. Koenigsberger, 1975; Rivkin, 1978; Amos, 1980; Litchfield and Darin-Drabkin, 1980; McAuslan, 1985; Dissanayake, 1987) focusing on development control have examined many challenges militating against effective and efficient implementation and enforcement of development control measures. Other previous studies have investigated issues surrounding either the three-stage development process (e.g. Appraisal Institute, 2008), comprising: permitting, construction, and absorption of the finished building, or the four-stage development process comprising: acquisition of project site, obtaining necessary approvals, constructing the building and leasing-up and operating or selling the building. However, there is a dearth of studies focusing particularly on how the 'development control system' could be synergized by the holistic, seven-stage 'land development process' both of which constitute mutually reinforcing and mutually supportive urban management tools for achieving city liveability and city sustainability in the 21st century and beyond. The present study is considered compelling and overdue in order to bridge this gap identified in the literature, thereby contributing significantly to the physical planning knowledge base both in terms of a possible extension of the frontiers of planning theory and improving city liveability and sustainability. Furthermore, existing planning theories (paradigms) such as synoptic planning, participatory planning, incrementalism, mixed scanning, transactive planning, advocacy planning, bargaining and communicative approaches, etc., are implicit or ineffective in explaining and analysing contemporary challenges faced by cities in pursuit of sustainable development goals due to uncertainty, crimes and insecurity from terror attacks (e.g. since September 9/11). Towards this end, this paper is designed to answer the following two research questions:

(i) What are the key features of the 'land development process' that may be embedded in the existing 'development control' system to facilitate the latter's social, economic and environmental relevance and promote city liveability and sustainability?

(ii) How can planners invent a new planning theory based on lessons learnt from a feasible, revamped development control apparatus?

As a rider to the second research question, one may ask: Why should planners invent a new planning theory? What is wrong with being flexible and meeting change as it happens? For example, some planners with many years of professional experience have argued that they always felt that planners were more like a fire engine group trying to get to a fire when it has already burned itself out but another fire is already underway elsewhere. Basically, by the time new planning legislation is approved by Government and in place the reasons for the change have moved on and have to be re-addressed, because the wheels of change grind exceedingly slow. Therefore, since theory and practice are mutually supportive and mutually reinforcing, a new planning theory can assist planners in overcoming the challenges associated with the current 'fire brigade' approach to development control to one that is more flexible and sustainable.

3. CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

The conceptual framework for this paper is provided by the theoretical lenses gleaned from the concepts of liveabilityand sustainability. Mercer (2016) defines liveability, the first part, as a concept that assesses which locations around the world provide the best or the worst living conditions. Assessing liveability has a broad range of benefits, ranging from benchmarking perceptions of development levels, to assigning a hardship allowance as part of expatriate relocation packages. However, critics of this concept have argued that no city in the world is really excellent and that liveability is only a relative

Country	City	Rank(Out of 140)	Overall Rating (100 = Ideal)
Australia	Melbourne	1	97.5
Austria	Vienna	2	97.4
Canada	Vancouver	3	97.3
Canada	Toronto	4	97.2
Australia	Adelaide	5	96.6
Canada	Calgary	5	96.6

Table 1: The five most liveable cities in the world, 2015. Source:The Economist Intelligence Unit Limited, 2015

term. According to the Economist Intelligence Unit Limited (2015), Melbourne in Australia remains the most liveable location of the 140 cities surveyed, followed by the Austrian capital, Vienna. Vancouver in Canada, which was the most liveable city surveyed until 2011, lies in third place (Table 1).

The Economist Intelligence Unit's liveability rating quantifies the challenges that might be presented to an individual's lifestyle in any given location, and allows for direct comparison between locations. Every city is assigned a rating of relative comfort for over 30 qualitative and quantitative factors across five broad categories: stability; healthcare; culture and environment; education; and infrastructure. Each factor in a city is rated as acceptable, tolerable, uncomfortable, undesirable or intolerable. For qualitative indicators, a rating is awarded based on the judgment of in-house analysts and in-city contributors. For quantitative indicators, a rating is calculated based on the relative performance of a number of external data points. The scores are then compiled and weighted to provide a score of 1–100, where 1 is considered intolerable and 100 is considered ideal. The liveability rating is provided both as an overall score and as a score for each category. To provide points of reference, the score is also given for each category relative to New York (United Nations Headquarters) and an overall position in the ranking of 140 cities is provided. Mercer (2016) evaluates local living conditions in more than 440 cities surveyed worldwide according to 39 factors, grouped in 10 categories as follows:

- Political and social environment (political stability, crime, law enforcement, etc.);
- Economic environment (currency exchange regulations, banking services);
- Socio-cultural environment (media availability and censorship, limitations on personal freedom);
- Medical and health considerations (medical supplies and services, infectious diseases, sewage, waste disposal, air pollution, etc.);
- Schools and education (standards and availability of international schools);
- Public services and transportation (electricity, water, public transportation, traffic congestion, etc.);
- Recreation (restaurants, theatres, cinemas, sports and leisure, etc.);
- Consumer goods (availability of food/ daily consumption items, cars, etc.);
- Housing (rental housing, household appliances, furniture, maintenance services); and
- Natural environment (climate, record of natural disasters).

The second part of the conceptual framework - Sustainability - embraces the four dimensions of sustainable development, namely: good governance, economic sustainability, social sustainability and environmental sustainability. In this 21st century, sustainability is regarded as a discourse and it includes sustainable building, design, operations, and the collection of policies and strategies that a city can apply to minimise its adverse economic, social and environmental impacts on future generations (http://www.environmentalleader.com/category/sustainability/#ixzz40CVURHa8 (accessed on 4 February 2016). Sustainability ensures that ecological concerns, such as the environmental impacts of pollutants, are balanced with socio-economic concerns such as minimising the consumption of limited natural resources to maintain their availability in the future (Rodriguez, Roman, Sturhahn, and Terry, 2002). Using the concept of sustainability (Figure 1), the performance of cities can be assessed based on an adapted "Triple-Bottom Line" model of sustainability (Elkington, 1997), to embrace the environmental, economic, social and good governance dimensions of sustainability (Weber, 2015).

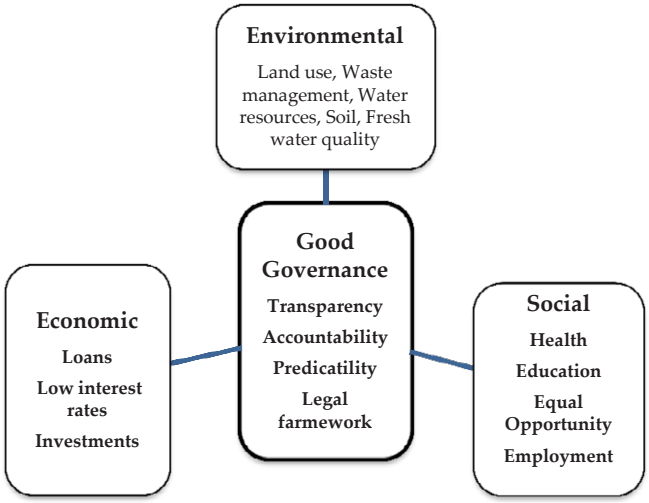


Figure 1: Part 2 of the Conceptual Framework: Sustainability. Source: Adapted from several sources (e.g. Rodriguez, et al., 2003; Karigawa, Babarinde&Holis, 2016)

According to Weber (2015), good governance entails processes, decisions and outcomes that sustain natural resources, alleviate poverty and improve quality of life. However, good governance is a complex variable that cannot be easily measured because it includes the state's institutions and structures, decision-making processes, the capacity to implement projects and the relationship between government officials and the public (World Bank, 1999). Yet, good governance within any legal entity will promote accountability and transparency (Weber, 2015) and it has both political and technical undertones. It relates to a nation's political system and how this functions in relation to public administration (Karigawa, Babarinde and Holis, 2016).

The environmental dimension of sustainability involves making decisions and taking actions that are in the best interest of protecting the natural world, with particular emphasis on preserving the capability of the natural environment to support human life without undue interference (FAO/ UNEP, 1999). Economic sustainability is a term used to identify various strategies that make it possible to use available resources to their best advantage, with a view to promoting the use of those resources in a way that is both efficient and responsible, and likely to provide long-term benefits to the society (Drexhage and Murphy, 2010). Finally, social sustainability occurs when the formal and informal processes, systems, structures, and relationships actively support the capacity of current and future generations to create healthy and liveable communities, while socially sustainable communities are equitable, diverse, connected and democratic and provide a good quality of life (http://www2.econ.iastate.edu/classes/tsc220/ hallam/HallamLectures/SocialSustainability.pdf, accessed on 24 May 2016). The lesson to be learned from this conceptual framework is that all existing cities should imbibe the concepts of liveability and sustainability in order for them to cope successfully with uncertainties in the future.

Graaskamp (1973) sets the stage for the discussion of complexities and nuances of the (land) real estate development process and argues that each real estate project, unlike many mass-production industries, is unique. Furthermore, the development process is so much a creature of the political process that society has a new opportunity with each major project to negotiate, debate, and reconsider the basic issues of an enterprise economy, i.e., who pays, who benefits, who risks, and who has standing to participate in the decision process (Graaskamp, 1973; Kohlhepp, 2012). Thus the development process remains a 'high-silhouette topic' for an articulate and politically sophisticated society. Graaskamp expands his definition of real estate development to include the entire economic and physical life of the development as it is planned, built, renovated and redeveloped. This view of the 'real estate (land) development process' appreciates the complexities of and multiple stakeholders in the process as well as the long term nature and on-going management of the real estate enterprise, although Graaskamp's work has been alternatively described as being both too theoretical and too pragmatic.

4. RESEARCH METHOD

This paper adopts the 'real estate (land) development model / matrix' (Kohlhepp, 2012) (Figures 2a,b) that simulates the actual land development process used in constructing a hypothetical block of twenty-five, 2-bedroom apartments in the City of Lae, PNG. According to Kohlhepp (2012) the matrix is organised around a 56-cell, stage-task matrix (summarised

Land Development Matrix **(8 Stages)**	**1.** Land	**2.** Land	**3.** Land	**4.** Building	**5.** Building	**6.** Building	**7.** Site
I. Acquisition	I. 1.	I. 2.	I. 3.	I. 4	I.5.	I. 6.	I.7
II. Financing	II.1.	II.2.	II.3.	II.4.	II.5.	II.6.	II.7.
III. Market Studies & Marketing Strategies	III.1.	III.2.	III.3.	III.4.	III.5.	III.6.	III.7.
IV. Environmental Studies	IV.1.	IV.2.	IV.3.	IV.4.	IV.5.	IV.6.	IV.7.
V. **Approvals and Permits** **a. Federal** **b. State** **c. Regional Authorities** **d. Municipal** e. **Private**	V.1.	V.2.	V.3.	V.4.	V.5.	V.6.	V.7
VI. Improvements	VI.1.	VI.2.	VI.3.	VI.4.	VI.5.	VI.6.	VI.7.
VII. Transportation/Accessibility	VII.1.	VII.2.	VII.3.	VII.4.	VII.5.	VII.6.	VII.7.
VIII. Sales and Disposition	VIII.1.	VIII.2.	VIII.3.	VIII.4	VIII.5.	VIII.6.	VIII.7.

Table 2: A 56-cell Development Matrix Comprising 7 Stages (Columns) and 8 Tasks (Rows). Source: Kohlhepp (2012)

in Table 2), which describes the entire land (real estate) development process in seven stages from the land banking stage to the redevelopment stage.

4.1 Model specification

The seven stages in the model are: (i) land banking (ii) land packaging (iii) land development (iv) building development (v) building operation (vi) building renovation and (vii) site redevelopment (Figures 2a,b). Each stage in the development process, according to Kohlhepp (2012), must also address eight categories of tasks (Table 2, left-hand column) indicated in eight rows (many of which are done simultaneously): (i) acquisition (ii) financing (iii) market research (iv) environmental studies (v) approvals and permits (vi) improvement construction (vii) transportation and accessibility concerns, and (viii) sales and disposition.

Kohlhepp (2012) argues that sustainable development and green building techniques are best understood and analysed in the context of the life-cycle of the building, rather than at the beginning of building construction (which is what traditional development control often does). The most important analysis of the sustainable nature of a development is made when the development is seeking various public approvals prior to the construction of horizontal (infrastructure) or vertical (building) improvements. However, Kohlhepp (2012) warns that users of this matrix (Table 2) must remember that, as with all real world applications of conceptual models, the lines separating the stages and the categories can be fuzzy. Nevertheless, he agrees that the model can be used as a descriptive, normative, or predictive model, and as a pedagogical tool, it can help planners and students understand the process, risks, and value creation in land (real estate) development.

The eight tasks may overlap and the distinctions may be fuzzy and blurred. However, it is important to note that each stage begins with the acquisition tasks and ends with the disposition tasks (Kohlhepp (2012). Furthermore, the other tasks are not done in any particular order and many are done simultaneously. A developer must work down a column or stage to create value in the process. On the other hand, a professional (e.g. a planner) must identify his/her skills in the task categories and then work across the row to determine how s/he fits or profits in the development process (Kohlhepp (2012).

5. FINDINGS AND DISCUSSION

In this section, the two research questions earlier posed in this paper are answered in turn, with particular reference to the hypothetical housing project (a block of twenty-five, 2-bedroom apartments in Lae City, PNG) used as case study.

(i) What are the key features of the 'land development process' that may be embedded in the existing 'development control' system to facilitate the latter's social, economic and environmental relevance and promote city liveability and sustainability?

As hinted under the model specification above, the most important analysis of the sustainable nature of a development can be made when the development is seeking various public approvals (Tables 2 and 3) from the planning authority prior to the construction and renovation of horizontal (infrastructure) or vertical (building) improvements. Furthermore, it should be noted that sustainable development and green building techniques are best understood and analysed in the context of the life-cycle of the building, rather than just at the beginning of building construction or renovation. Therefore, the answer to the first research question lies in how skillfully the planning authority and/or planner is able to accomplish the fifth task (approvals and permits) under each of the seven stages of the development process. For the hypothetical housing project (a block of 25 apartments), Table 3 indicates the minimum responsibilities that the planning authority and any planner acting as consultant to a developer must perform in conjunction with allied institutions/agencies/professionals and the project developer during the life cycle of a project. Consequently, if development control in cities is to become more effective and more relevant for purposes of achieving the liveable and sustainable cities that we all urgently need, then, the key plan approvals and permits in Table 3 must be carefully embedded in the existing development control apparatus, subject to individual country's or jurisdiction's planning policies and regulations.

(ii) How can planners invent a new planning theory based on lessons learnt from a feasible, revamped development control apparatus?

As a step towards answering the second research question, this paper argues that existing planning theories are implicit or ineffective in explaining and analysing contemporary challenges faced by cities in pursuit of sustainable development goals due to crimes, general uncertainty and insecurity from terror attacks (e.g. since September 9/11). A good planning theory is an attempt at explaining physical planning context that guides planning practice, points

The 7 Stages of the Devt. Matrix	Central Government	Prov. Govt. via DLPP	Municipality/Local Govt.	Private Developer
1. Land Banking	1.a Lands Minister approves the purpose (zoning) of land acquisition and land banking for project development. As a matter of policy, planning authorities must tie the land title to project plan(s) as a condition for granting planning permission as done in the UK, or ask for deed of transfer of land as a proof of land ownership by the developer.	1.b Request certificate of land title or deed of conveyance; obtain approval from the community.	1.c Site inspection; approves land subdivision, site location and environmental reports on land to avoid contaminated land; garners public participation; issues interim planning consent	1.d For building leases, obtains the landowner's approval; obtains interim planning consent; seeks expert legal advice.
2. Land Packaging	2.a Minister for Environment and Conservation approves EIA Report; Transportation Minister gives approval; Wildlife Dept. gives approval; Govt. agencies obtain govt. approval of projects on government land.	2.b Approves zoning on both alienated and customary lands; approves conveyance or other legal titles to land. Verifies legal title and survey plan; verifies registration in the Lands Register.	2.c Approves land packaging proposals; issues occupancy permit.	2.d Seeks approval, through a project manager (who should be a planner), from land planning and lending experts on zoning and project financing; obtains professional advice on project plans and feasibility report (where necessary).
3. Land Development	3.a	3.b Issues Certificate of ownership and Survey Plan; approves community and transportation plans; issues full or conditional planning consent; verifies EIA Report; project clearance for piped water and sewerage.	3.c Issues occupancy permit; foundation work approval; regular site inspection.	3.d Seeks audience with planning authority for plan review where conditions are imposed; obtains short-term bank loan(s); obtain agreements on restrictive covenants, easements and development charges.
4. Building Development	4.a	4.b Verifies land title and Survey Plan; Building permit issued by the National Capital District (NCD); permit issued by Fire Authority.	4.c Issues building permit based on resilient and crime/terror- proof standards; frame inspection; regular site inspection.	4.d Seeks audience with planning authority for plan review where conditions are imposed; obtain long-term bank loan(s); project manage-ment services through a planner as project manager.
5. Building Operations	5.a	5.b Issues certificate of ownership and Survey Plan	5.c Fire rating approval; occupancy permit; regular site inspection.	5.d Project manage-ment services through a planner as project manager.
6. Building Renovation	6.a	6.b Issues certificate of owner-ship, Survey Plan Issues planning consent.	6.c Frame inspection; occupancy permit; regular site inspection	6.d Project manage-ment services through a planner as project manager.
7. Site Redevt.	7.a	7.b Issues certificate of owner-ship, Survey Plan Issues planning consent.	7.c Frame inspection; occupancy permit; regular site inspection.	7.d Project management services through a planner as project manager.

Table 3: The 4 Levels of Development Approvals in Papua New Guinea. Source: Author, 2016

Notes: i) There are no Regional Planning Authorities in Papua New Guinea. There are 22 provinces in the country (ii) The private developer will benefit more if a physical planner is appointed as project manager right from the start to provide project management services till completion and hand-over of the project.

planners towards strategies of response, prompts practical insights, anticipates outcomes, reminds us of what we need and what is important when we get stuck and alerts us to problems or crises (Forester, 1987; Fainstein and DeFilippis, 2016).It is contended that most of the existing planning standards and building regulations that planners have used for decades as basis for enforcing development control in cities need to be overhauled and replaced with smart planning standards and building regulations that are compliant with Crime Prevention through Environmental Design (CPTED) objectives and principles (Cozens, 2016), which should then feed into a new development control apparatus for towns and cities. Unfortunately, this is still a mirage. To make this proposal achievable, all provinces and municipalities would need to organise series of workshops and seminars to brainstorm on smart planning standards and building regulations, which may produce a viable communiqué for approval by those provincial and municipal authorities charged with plan approval functions. Once a functional and legally feasible development control system is agreed by all stakeholders including environmental planning practitioners, policy planners and planners in the academia, this should be followed by the setting up of "schools of thought", "brainstorming groups" or "think-tanks" in all notable planning associations world-wide, spearheaded by the International Society of City and Regional Planners (ISOCARP). The goal of these think-tanks should be to invent a unified development-planning theory that is context-driven or situational and avoids dogmatism in practice, reflects contemporary culture, politics and social issues of our time. The specific goal here is to come up with a development-planning theory that is future-oriented and capable of spurring planners into conscious decision-making, while linking direction with action.

At this juncture, the question arises: Do we really think that ISOCARP can occupy such a centre stage position with the various challenges facing the association, including finance? Anyway, the overall theory is suspect because as hinted clearly elsewhere in this paper that the situation for different countries will be, simply put, different. There is no magic silver bullet which can be universally applied. Perhaps this is the Achilles Heel of most theorists, i.e. the assumption that we can find a way which can be applied worldwide or even a simple but refined planning system which can be tweaked a little here and there to meet different countries' needs. However, this is only a personal point of view and it may be just a little cynical. However, it is a fact, as most planners know very well, that Planning is not an exact science. Some planners might rather like the ad-hoc approach which has an overarching set of universal objectives that may be modified as required by changing circumstances and geographical locations as well as what is economically feasible for each country. Of course, we need to think continuously about the world as it develops especially with regards to city liveability and sustainability and a better and brighter future for everyone; but a quick glance at the horrors of Syria, the refugee problem, etc., makes for a gargantuan wake up call. Can planning really deliver what it would like to deliver? That is surely the question that needs to be answered. I presume that your use of the word "dynamic" below may mean something similar to that objective.

Nonetheless, it is a fact that the recommended collaborative approach to developing a dynamic, development-planning theory obviously differs from the age-long experience where most of the existing eight (8) procedural planning theories (earlier mentioned in this paper) were the outcomes of individual theorists' ingenuity or insights (e.g. Lindblom's science of muddling through, 1989; Etzioni's mixed-scanning, 1968; Friedman's transactive planning, 1973; Davidoff's advocacy and pluralism; 1965). It is high time that a development-planning theory became a strong point of reference for liveable and sustainable cities and for preventing urban sprawl. Such a new planning theory should be something that any planner can turn to when unsure of the proper path to follow when searching for solutions in planning practice. It should also be a plausible or scientifically acceptable general principle or body of principles offered to explain city phenomena. To kick-start this discourse and answer the second research question in this paper, we can conceptualise "the cities we need" as follows:

> Cities are liveable, sustainable, location-specific and big-picture organisms that are composites of organised, multiple land development projects and built-environment processes, which consist of fuzzy 'stages' and 'tasks' that must be analysed, harnessed, synergized and diligently managed in the context of the life-cycle of buildings, community facilities, public utilities and municipal services so as to promote safety, good health, beauty, economy and their mutual interactions.

6. CONCLUSION

This paper is an innovative attempt at bridging the gap between the cities we have and the cities we need not only in the 21st century but also beyond,

using the integrated tools of development control and holisticland development process to achieve the vision of liveable and sustainable cities. Towards this end, the paper adopts a conceptual framework that is woven around the theoretical lenses of liveability and sustainability as benchmarks for the cities we need. On the theory that sustainable development and green building techniques are best understood and analysed in the context of the life-cycle of the building, rather than just at the beginning of building construction and renovation, the paper adopts the holistic land development process to demonstrate the roles that planners and planning authorities can play through plan approvals and permits to make the vision a reality.

Two research questions were answered by the paper, based on a case study of a hypothetical housing project in Lae City, Papua New Guinea. The first question seeks to identify whatkey features of the 'land development process' may be embedded in the existing 'development control' system to facilitate the latter's social, economic and environmental relevance, city liveability and city sustainability. Findings from the case study reveal that the exercise of due diligence by planners and planning authorities, working in concert with other development agencies and professionals during the stages of granting planning approvals and permits to building operations, holds the key to the cities we need. Following up from the first research question, the second research question examines how planners can invent a new planning theory based on lessons learnt from the adoption of a revamped development control apparatus. Findings suggest that the best approach to doing this is for all planners, regardless of where they are, to collaborate and brainstorm on a dynamic, development-planning theory that can serve the planning profession as a strong point of reference in their pursuit of liveable and sustainable cities that we really need now and in the future.

This paper may have approached urban planning from a real estate perspective, but the author is well aware that there are a great many considerations which add up to a liveable city including green-blue space provision, comfort of place and space, clear lighting, excellent transportation networks, affordability especially with regard to housing, ability to make a viable life with freedom to worship as one chooses and so on. The same question almost always will evoke a different response from different people and responses will vary from country to country. Things which make for an unhappy city life include civil war, any war...can happen and at any time anywhere, unsafe streets, lack of human socialising, poverty, and so on. No organised system on this earth can deal with that assortment or cocktail of problems, which also include issues of neighbourhood development, adequate health and educational provisions, urban design to include parks for jogging, cycling, pushing the pram, walking the dog, etc. To sum it up, the standard of liveability and sustainability that matches our dream of the cities we need may really be a fantasy that is worth being pursued by planners because we are as big as our dream!

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Determining the social and spatial vulnerability of a place from potential natural hazards

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As a region continues to grow in terms of demographic, economic and cultural backdrop, its vulnerability to potential hazards also increases. The increasing intensity of natural hazards from past few decades has resulted in escalation of the losses of life and property, prompting a modification in the disaster reduction policy. Effective preparedness and mitigation of disasters need identification of potential hazard and an assessment of vulnerability elements in a particular place. The vulnerability of a place however, is not specifically dependent upon the proximity to the hazard source. Social factors play an important role that defines the resilience of a system. This paper presents a spatially explicit method to assess the social vulnerability of a place from potential cyclone threat, which is a major natural hazard in the coastal regions.

1. INTRODUCTION

Natural hazards are unavoidable. Simultaneously, due to increasing population and demand for a better life, development is inevitable. The greatest challenge in the recent urban and regional planning is to deal with the natural catastrophe, and at the same time to secure the human lives and infrastructure. To overcome this challenge there is always a necessity to know what makes a place more vulnerable than the other, assuming a similar intensity of hazard. Nonetheless, it seems like a very simple question, but the complexity lies in the societal phenomena of unequal distribution of resources, access to basic services etc.., that gives rise to vulnerability. Vulnerability is considered as a degree of exposure of a system from any potential threat (Cutter 1996). While dealing with such a complex process of vulnerability in planning one needs to assess the existing scenario of social status of a place (Adger 2006, White 1936, Birkmann 2006). The assessment of social vulnerability conceptualizes the place-specific social elements that could be a possible high impact factor for the vulnerability of that location. Therefore, for such an assessment, quantification of social vulnerability is 'a must' in order to identify the vulnerable places. In this context, Cutter et al. (2003) had established a methodology to determine the probable factors of social vulnerability in the USA. Later on, this methodology was modified and applied to various regions around the globe (Holand et al. 2011, Schmidtlein et al. 2008, Chakraborty et al. 2005). In India, few attempts have been made to study vulnerability in social context. Mazumdar and Paul (2016) had studied the vulnerability by considering an exhaustive social and infrastructural variables to identify the vulnerability of eastern coastal districts of India. However, several works have been done in revealing the physical vulnerability of place (Kumar and Kunte 2012, Das 2012, Sharma and Patwardhan 2008). Hence, there is a need for a comprehensive social vulnerability assessment in order to highlight the importance of vulnerability to hazard studies in social context. This gap is to be filled with the proposed Social Vulnerability Assessment Index (SVAI).

The present paper addresses the issue of social vulnerability to natural hazard by assessing the existing scenario of the blocks of Odisha state in India. It provides an insight to the level of resilience of the blocks from natural hazards, particularly tropical cyclones. The paper addresses the questions of vulnerability to natural hazards, highlighting the issues of what are the places that are vulnerable to potential cyclones and why they are vulnerable. In addressing these questions, an attempt has been made to construct the Social Vulnerability Assessment Index (SVAI), in order to identify the blocks which blocks, which are prone to potential cyclones and are the underlying factors responsible for the vulnerability of those blocks. The SVAI reveals certain characteristics of the population that exposes and makes them susceptible to hazard threat.

In context to the cyclone hazard of Odisha, the objective of SVAI is to identify and quantify the factors responsible for social vulnerability. The input variables selected for this index are based on the notion of 'most probable factors' that could increase or decrease the vulnerability at the time of cyclone. Some of the variables (like education, health infrastructure, employment etc.) in the index could also be used for measuring vulnerability to other hazards. This is a 'standalone index' and ensures no direct dependency on hazard factors. It rather indicates and captures the social vulnerability causes of each block of Odisha.

1.1. Importance of social vulnerability to city and regional planners

The focus of urban and regional planners is to prioritize the most realistic, constructive and reasonable set of preparedness goals of disaster. While planning the benefits of SAVI for planners and disaster managers, the emphasis should underline the following:

- Act as optimal criteria for social vulnerability information system that can be quantitatively measured.
- Act as a geo-informatics mapping tool to enhance spatial visualization of the social vulnerability factors.
- It should bridge the gap between identification of social vulnerability factors and prioritize the selection of preparedness actions.

2. STUDY AREA

The present vulnerability study has been applied to all the blocks of Odisha state lying on the east coast of India (Figure 1). 477 blocks exist within the 30 districts in Odisha. Every year on an average 4 cyclones hit the coast of Odisha disrupting the everyday lives of the people. Odisha is exposed to 480 km long coastline. The topographic characteristics, bathymetry, near-funnel shape of the coast make Odisha a naturally vulnerable place from cyclones (Dube et al. 2000).

3. METHODS

3.1. Vulnerability Index Framework

The indices of vulnerability consist of numerous social, economic and infrastructural variables that explain the distribution of spatial vulnerability across the study area. The creation of SVAI variables is based on an exhaustive literature review. Most of the data are collected from the Census of India 2011 in order to make sure that the variables are location and scale specific.

The Principal Component Analysis (PCA) with an input of 33 variables was selected (Table 1). Once the variables were identified, the pre-processing of the data was done in order to remove multicollinearity and log transform the variables, which reduce kurtosis and skewness in the data. The primary method applied here is "factor analysis" which was computed in SPSS. Specifically, PCA was applied for the reduction of a large number of variables, which was extracted from the Census. PCA has been considered as one of the best ways to reduce a large number of variables into factors due to its reliability (Cutter et al. 2003). The usability of PCA is dependent on Barlett's test of Sphericity, Kaiser-Meiyer-Olkin (KMO) test.The values higher than Eigen value 1 has been retained (Figure. 2).

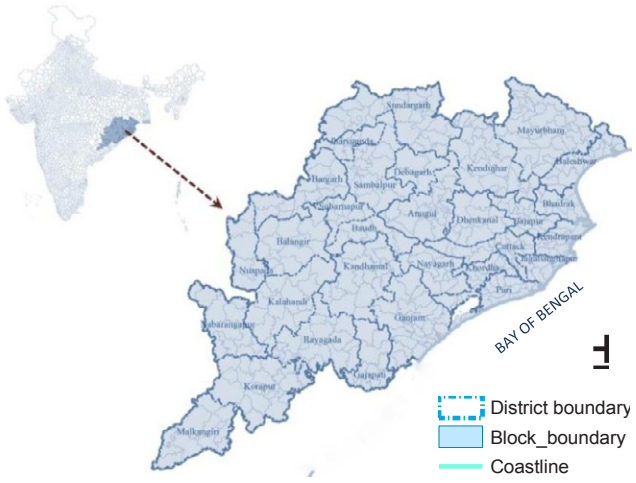
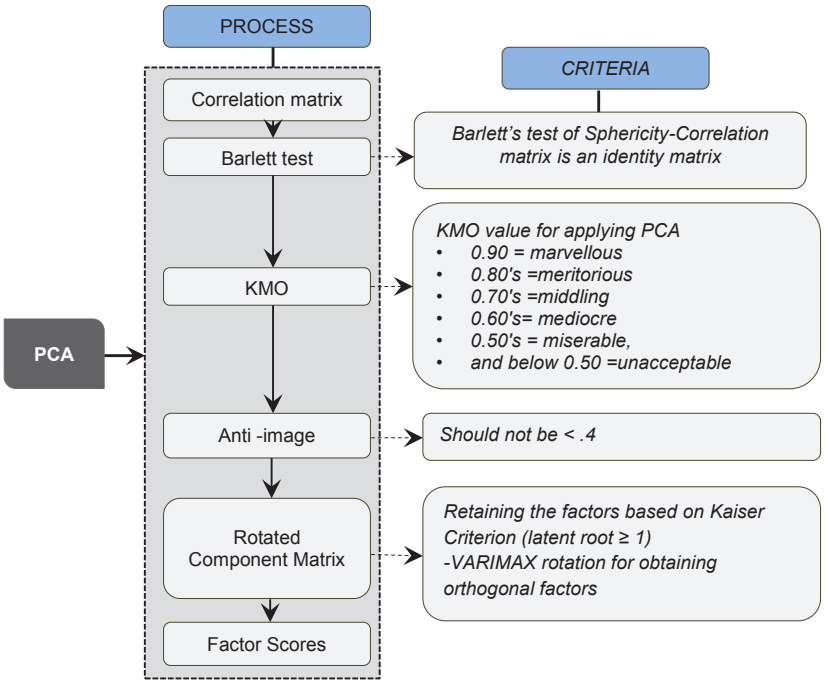


Figure 1. Location of Odisha

Table 1. Description of variables for SVAI

Variables	Description	Sources
House_Den	Housing density	(Winsor et al. 1994, Cutter et al. 2003)
Wall_kucha	%Wall Kuccha	(Das 2012)
No_sanit	% Household with no sanitation	(Cutter et al. 2003)
Untrt_water	%Household having untreated water	(World-Bank 2003)
No_br	% Household with no bathroom	(Mazumdar and Paul 2016)
Opn_drn	% Household with open drainage	(Lee 2014, Balica et al. 2012)
No_drn	% Household with no drainage	(Mazumdar and Paul 2016)
No_radio	%Household having access to radio communication	(Adger et al. 2004)
No_internet	%Household having no access to internet	(Adger et al. 2004)
No_telephone	%Household having access to telephone	(EM-DAT 2009)
2wheeler	%Household having access two wheeler	(Das 2012)
Popden	Population density	(Armaş and Gavriş 2013)
Margwrker	%Total marginal workers	(Holand et al. 2011, Borden et al. 2007)
% Livable housing	% Housing under livable condition	(Cutter et al. 2003, Birkmann 2007)
%Dilap_housing	%House dilapidated	(Schmidtlein et al. 2008)
%Roof_kuchha	% Roof Kuchha*	(Mazumdar and Paul 2016)
%Floor_kuchha	%Floor Kuchha	(Mazumdar and Paul 2016)
%HH_away_water	%Household having access to portable water away from residence	(Mazumdar and Paul 2016)
%HH_electricity	%Household having access to electricity	(de Sherbinin 2014)
%HH_no_sanitation		(EM-DAT 2009)
%T_HH_bank	%Household having access to banking facilities	(EM-DAT 2009)
%Hh_tv	%Household having access television	(EM-DAT 2009)
%HH_mobile	%Household having access mobile phones	(EM-DAT 2009)
%HH_cycle	%Household having bicycle	(EM-DAT 2009)
%HH_no_asset_specified	%Household having no basic assets	(EM-DAT 2009)
%H_temp_structure	%House having temporary structure	(EM-DAT 2009, Joerin et al. 2012)
%SC_pop	% Scheduled castepopulation	(EM-DAT 2009)
%ST_pop	% Scheduled tribe population	(EM-DAT 2009)
%Illiterate_pop	% Illiterate population	(Mazumdar and Paul 2016)
Hhsize_morethan5	% Household having more than 5 members	(Mazumdar and Paul 2016)
Child_pop	%Child population (0-6 years)	(Das 2012)
Sexratio	Sex ratio- female per thousand males	(Cutter et al. 2003)
Non_worker	% Workers who are not employed in any sectors.	(World-Bank 2003)

Figure 2. Methodology for applying PCA



3.2. Mapping vulnerability

Spatial mapping of vulnerability is a powerful tool to visualize the areas of high vulnerability. The applicability of GIS in this paper lies in the spatial identification of vulnerable blocks. The factor scores generated from PCA has been applied for the spatial mapping of social vulnerability using Jenk's Natural break technique in ArcGIS software.

4. RESULTS

4.1. Statistical consistency of PCA

The input of 33 variables reveals the seven latent factors that explain 77.72% of the total variance. The Barlett's test of Sphericity and KMO is 0.866 which is within the acceptable range for the application of PCA. A total of 7 Principal Components (PCs) were retained after varimax rotation (Kaiser criterion) having >1 Eigen value (Table.2).

4.2. Spatial Analysis

The social vulnerability assessment mapping illustrates the spatial distribution of social vulnerability within the blocks of Odisha. By using Jenk's natural break method for classification, the social vulnerability was categorized into five classes (Very low, Low, Medium, High and Very High), in order to provide a spatial visualization of vulnerable blocks (Cutter and Finch 2008, Borden et al. 2007). The higher social vulnerability has positive loadings while negative scores represent a lower vulnerability in the blocks. The overall place vulnerability shows several spatial patterns of exposure in each block (Figure-3). SVAI scores are highest along the coastal blocks of northern Odisha and parts of southern Odisha, such as blocks in the districts of Balasore, Bhadrak, and parts of Jajapur. The percentage share of population under each SVAI category shows that around 7% of the population are in "very high" category followed by 24.60% in "high" category of social vulnerability. The remaining share of the population are in the medium, low and very low category (Figure 4). Figure 5. (a-g) shows the spatial pattern of each score for each of the blocks of Odisha (the detail of each component of SVAI has been described in Table 2).

Components of SVAI	Variance explained (in %)	Description
PC-1:Access to basic services and entitlement of assets	25.53	It improves living conditions as well as creates awareness in the society. Therefore, it decreases impact on vulnerability.
PC-2: Marginalized population	17.33	Population under this category generally sustain on government welfare and they are difficult to identify at the time of disaster. It increases vulnerability
PC-3: Density	8.99	Any kind of density is a potential risk at the time of hazard as it increases the congestion and reduces the open space for evacuation process.
PC-4: Poor Housing structure	8.24	Houses that have non-masonry structure are considered more vulnerable. Thus, it has positive loading effect on vulnerability.
PC-5: Health and sanitation	6.44	Poor sanitation increases the chances of flooding, and poor health care facilities reduce the capacity of a place to tackle with the causalities that might occur at the time of cyclone event. Hence, it increases social vulnerability.
PC-6: Dilapidated housing	5.85	Dilapidated houses are more prone at the time of cyclone. Therefore, it increases vulnerability.
PC-7: Unemployment	5.31	Unemployment reduces the capacity of population to recover after a hazard event. Hence it increases social vulnerability

Table 2. Extracted components from rotated component matrix*, variance explained by each factors and its description

**Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 8 iterations.*

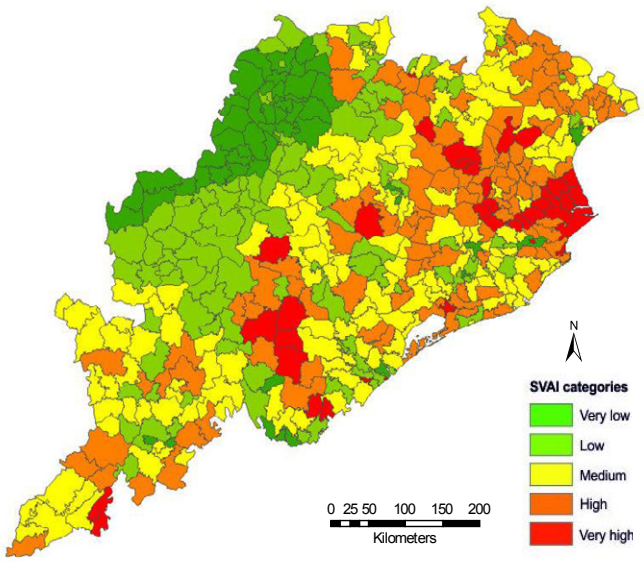


Figure 3. Spatial distribution of social vulnerability

Figure 5(a) - This spatially illustrates that the concentration of vulnerability arises due to lack of access to basic services and entitlement of assets. Blocks with higher loading on this factor are highly concentrated in the western parts of Odisha. However, few blocks in the eastern coastal districts of Balasore, Bhadrak, and Ganjam in the southern coast are also included. The main variables contributing to the vulnerability of these blocks are households having no drainage facilities that might increase the chances of flooding at the time of cyclone due to heavy rain. Other contributors are households having no banking facilities, no access to television, the internet, mobile phones – which are used for the dissemination of early warning system. This factor (PC-1) has the highest loading on SVAI and has a positive functional relationship with social vulnerability.

Figure 5(b) - The second factor of SVAI is the marginalize population which consists of scheduled tribe, scheduled cast, children below 6 years age and higher sex ratio. They are also contributors of vulnerability. Positively loaded blocks are forming a cluster in the western and eastern parts of Odisha while, negatively loaded blocks are concentrated in the southern parts, few are in central Odisha.

Figure 5(c)-This factor consists of two variables i.e. population density and housing density. The Higher density of any factor leads to congestion and unplanned growth that might hamper evacuation process at the time of disaster. Most of the blocks in this category are highly concentrated in the eastern coastal areas.

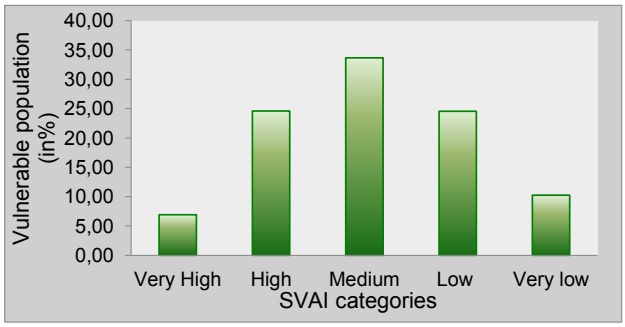


Figure 4. Percentage share of population under SVAI categories

Figure 5(d) - Most of the blocks under this factor are concentrated in the districts of Cuttack, Jagatsinghpur and Balasore in the northern coastal area, districts of Baudh and Anugul in the central part and few scattered blocks in the southern parts of Odisha. This factor of vulnerability has a positive relationship with social vulnerability.

Figure 5(e)-The positively loaded blocks in this category are highly concentrated in the northern part of Odisha while negatively loaded blocks are in the southern districts. Health and sanitation are complimentary to each other as it is a proven fact that good sanitation leads

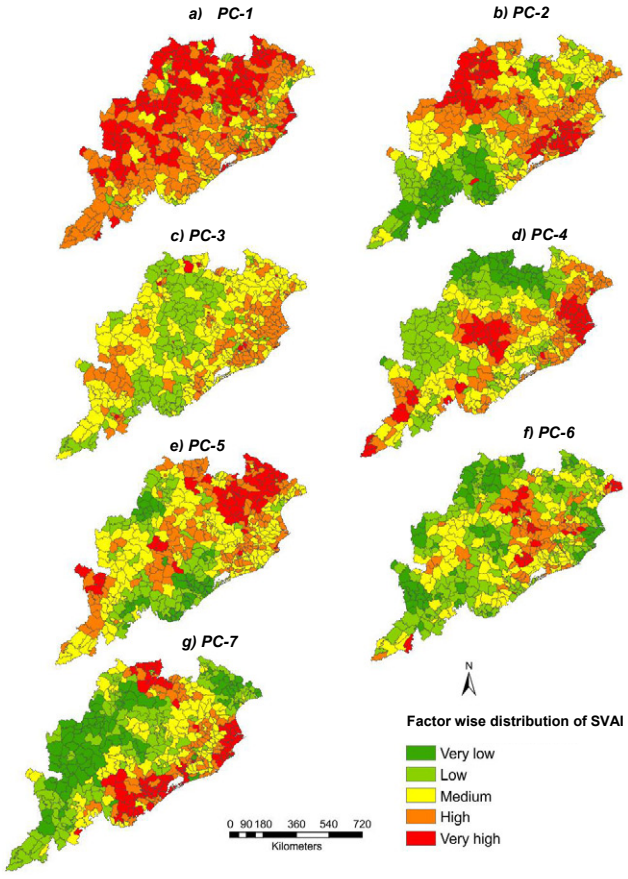


Figure 5. Spatial distribution factors of SVAI (for description of PCs refer table1)

to healthy life. Therefore, it has a negative relationship with social vulnerability.

Figure 5(f) - Most of the positively loaded blocks in this category are scattered in the central parts of Odisha that are under the very high-risk category. It has a positive relationship with vulnerability.

Figure 5(g) - The category of unemployment is highly concentrated in the urban blocks located in the coastal areas. In addition, most of the population from rural parts of Odisha move to cities located in coastal areas like Cuttack, Bhubaneswar, Khorda and Berhampur for employment and end up being unemployed due to high demand and low supply of jobs. It has a positive relation with social vulnerability.

The results clearly illustrate the spatial variation in the distribution of social vulnerability across the state of Odisha. It shows that the exposed coastal blocks experience higher vulnerability than the blocks located inward from the coast. Thus, the increase in cyclonic winds accompanied by heavy rain can pose an adverse threat to the coastal communities, which need to be taken care of on a priority basis.

5. DISCUSSION

Social vulnerability is a product of inequality, poverty, inaccessibility to resources, and lack of entitlement (de León 2006, Turner et al. 2003, Blaikie et al. 1994). The motive behind emphasizing the place specific vulnerability assessment is that local level analysis gives an understanding of those places that are undergoing substantial amount of social vulnerability. Numerous studies on vulnerability have been done in global context, which has emphasized the significance of social vulnerability research in studying the impact of hazard on society (Schmidtlein et al. 2008, Cutter et al. 2000, Rød et al. 2012). Certain questions are important, such as, 'what actually triggers a disaster, and whether it is solely dependent on the physical features of the area or social status of the population in order to tackle with the hazard impact. Nevertheless, physical features like topography distance from sea, path of cyclone track, bathymetry etc. play a very important role in exposing a place from hazard event (Cutter et al. 2003, Boruff et al. 2005, Borden et al. 2007). However, social factors act as an 'add-on' mechanism to the increasing vulnerability of the affected place.

This paper highlights the importance of social vulnerability assessment at sub-district level. The SVAI identifies the strength and weakness of each block based on social attributes that might contribute to high vulnerability. It is possible that the factor scores of two or more blocks have equal vulnerability score, but with the use of this index, it is possible to identify which factor is actually contributing to the place vulnerability of that area. Additionally, spatial mapping of SVAI illustrates a spatial variation in the distribution of social vulnerability across the whole state of Odisha. The visual representation through geospatial techniques is highly recommended by various researchers, planners, and disaster managers in order to identify the location of vulnerable areas (Kumar and Kunte 2012, Mahendra et al. 2011, Montz and Tobin 2011) The recommended policies for SVAI implementation are:

- Inclusions of SVAI notion or similar vulnerability indices at national, state and local-level disaster management documents and make it available at the time of drafting regional development plans.
- Encourage more research on social vulnerability to potential hazard events. The use of GIS and statistical approach with ground survey details should be incorporated in such research themes.
- The implication of SMART cities concept could only be achievable completely when planners start taking into account not only the vulnerability of built structure but also place emphasis on the social factors.

6. CONCLUSION

The methodological conceptualization of SVAI demonstrated in this paper is not an ultimate tool for assessing the susceptible population. It is designed and conducted to assess the probability of being susceptible to any potential hazard events and to ensure the well-being of the population in each block of Odisha. Additionally, SVAI reveals that spatial inequality persists in the distribution of social vulnerability across Odisha and attempts to find out the most important factors contributing to it. Therefore, the issue of social vulnerability is important and should be addressed by the planners, policy makers and disaster managers for a resilient society.

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Intergovernmental organizations and human settlements: how the world polity is shaping the debate on cities

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The period between 2015 and 2016, the "Year of Sustainable Development", represents a crucial point in time where a set of global agreements concerning development goals, climate change and human settlements, were negotiated and endorsed by the international community. For the first time, these new documents give specific attention to urban areas and their management tools. While many sectors are addressed within international agreements and national policies, cities have emerged as a specific focus to measure the reduction of environmental footprints, the advancement of social inclusion, and the promotion of green economic development.

This article reflects on the urban debates emerging within global policy in respect of the intergovernmental arena (the Sustainable Development Goals, the United Nations Framework Convention on Climate Change, the Post-2015 Framework for Disaster Risk Reduction and the New Urban Agenda) around the centrality of urban development in the global agenda for 2030 and beyond.

This evolution places cities, their management tools and professionals at the core of global strategies for sustainable development, in order to implement local and international policy directives.

1. INTRODUCTION

The international community over the past 50 years has engaged in the challenging domain of sustainable development. The United Nations system, together with most international organisations have been concerned about the definition of a common framework for discussion and action. The economical, ecological, cultural and social sectors jointly contribute to sustainable development. The mutual relations among the latter sectors trigger trade-offs when one domain overpowers others.

While the majority of the global population reside in cities and urbanisation and life in cities becomes a dominant global trend, the challenges related to cities have garnered the attention of international debate. World polity has increasingly addressed the challenges of sustainable development, as well as its urban dimension.

More specifically intergovernmental agencies, funds and programmes or the UN GA itself understand the relevance of urban policy and planning to address sustainable development and its goals. From an Intergovernmental Organization (IGO) perspective, an emergence of attention to cities and their management systems (including the urban planning discipline) to turn human settlements and their capital (buildings, citizens, infrastructures etc.,) into active input factors for sustainable development .

This crossroad is also accompanied by an evolution of planning theory that opened to emerging themes (i.e. those related to sustainability) and becomes more responsive to new forms of public management, decision making processes, communicative rationality and the various forms of participation, collaboration and coordination (Campbell S. , 1996) (Jessop, 2004); (Harvey, 1989); (Habermas, 2001); (Davidoff, 1965); (Susskind, 1999); (Healey P. , 1997)). While the core of the planning practice stays at municipal level and it is bound to comply with obligations required by statutes (i.e. land-use, development, behavioural and systemic norms, and eventually building rights), new dimensions, tools and approaches to urban development are introduced to set the legal basis to comply and achieve the objectives set through the international processes of policy coordination.

In the last few decades, the attention of IGOs on cities has been considerably growing. One of the very first attempts to provide a shared framework and principles of sustainable development has been provided by the Stockholm declaration, an outcome document of the United Nations Conference on the Human Environment (1972). The declaration

contains 26 principles among which specific attention to human settlement is paid, especially with respect to the management and reduction of environmental externalities.

The last two decades are marked with milestones in international agreements such as the Kyoto protocol (and the UNFCCC), and the Millennium Development Goals. Environmental responsiveness of states' policies emerged as widespread concern in several countries/cities emerged as structural component.

At this point in time, between mid 2015 and October 2016, several of the international agreements that have inspired governments' policies will be re-negotiated.

The past few years represented an unprecedented occasion in which the international community has engaged in an extensive and inclusive consultation phase towards the adoption of the Post-2015 Framework for Disaster Risk Reduction at the Third World Conference on Disaster Risk Reduction (March 2015), the Sustainable Development Goals (September 2015), the new United Nations Framework Convention on Climate Change at COP21 (December 2015), the new Urban Agenda at H III Conference (October 2016). These are also known as a global process. Salience of the global processes for national policy making is rather high. In fact, mechanisms of policy convergence, synergistic strategies and implementation plans will be endorsed by national governments and translated into policy making. One of the fields of such coordination is SDG 11 to promote "Inclusive, safe, resilient and sustainable cities and human settlements" (proposal for SDG 11).

In parallel the planning theory and practice are characterised by a "reinvigoration of theoretical discussion within the discipline" (Fainstein, 2000, p.451) in which a number of contributions (i.e. Fainstein, 2000; (Marcuse, 2011) (Campbell H. , 2012); (Friedmann, 2008)) were suggesting theoretical references to reframe planning discourse and proposing key directions of contemporary planning to overcome the uncertainties of the practices while a strong role and effectiveness of urban planning is called by cities, citizens and the intergovernmental community. Ties between planning and institutions are very strict (Kim, (2011); Neuman, (2012)), while the less institutionalised form the linkages between cities and diplomacy. The involvement of international organisations in talks and programmes focused on cities has brought cities to a new tier of decision making, the one of the world polity. This pattern has exposed cities to a rather complex multitude of stakeholders, procedures and rituals. LeFèvre (2012) reports that cities had faced certain difficulties to enter in the above polity especially during the first phases of climate change negotiation. More recently, the participation of cities and their recognition as stakeholders has been advanced also in relation with the establishment of institutions representing cities in the global arena (i.e. ICLEI and UCLG among others).

Growing urban inequalities, asymmetric welfare delivery, a notable ineffectiveness of the planning practices to address urban development and to manage the implementation of its provisions have triggered the evolution of planning practices. More recently the discipline seems to build capacity in the orientation of decision-making process, to adopt a governance approach and most of all it can be framed within a policy tools approach. This step might be considered a deal to clear the doubts that may identify and confine the planning practices to the city plan. Indeed, this broadening of planning discipline builds stronger links to the activities and mandates of IGOs, that certainly can drive deep changes in the way planning and urban management is addressed. On one side in fact, planning can be seen as one of the governments' tool to implement or design states' public policies (especially those with territorial impact and focus), on the other it provides a wide array of tools to implement and support the implementation of policy goals deriving from other public policy domains.

International Organizations (IO) and Intergovernmental Organizations (IGO) are one of the most important heritages of the XX century world wars. Since the 1940s there has been a proliferation of International Institutions, treaties and arrangements among states accompanied by a deepening of regional integration as formal representation of the institutionalization of world polity and politics (Simmons and Martins, 2001). While the fields of this international politics arena were traditionally related to security, economics and monetary domains, trade, justice and human rights, it is of great interest to note that the evolution of IOs efforts on development become increasingly relevant also for the urban studies and planning domain, this evolution is due to the process of specialization that IGOs have undergone.

The main advantages to conceive policy and strategies in IGO regimes is due to: the agency and agenda setting influence; their socialization capacity; the capacity of IOs to increase the systemic efficiency because of their centralization (concrete and stable organizational structure and supportive administrative apparatus managing collective activities); and independence (the authority to act with a degree of autonomy and neutrality according to the mandate). Given these features the role of IOs as platforms for dialogue, exchange and policy formulation can be fully validated; from a network analysis perspective it also emerges that much of these IOs capacities derives from the high degree of centrality and resources mobilization that these institutions are able deploy. The benefits of international regimes are concerned to the bundle of benefits related to international norms and agenda setting and to institutional and policy coordination. The first set, of norms and agenda setting, are more rooted in the legitimacy of internationally socialized processes rather to the authority of the international regimes. The UNFCCC can be taken as example: in fact the salience and legitimacy of a norm built by nearly two hundred parties under the auspices of an IGO does not entail any evidence that this architecture is the most effective and efficient to tackle climate change (content related), but rather because multilateralism has attained a degree of legitimacy to govern a common such as the environment is (process related).

The second set of benefits refers to the effective capacity of IOs to engage (at different degrees, ranging from non-opposition to actual commitment) the parties in cooperative behaviors and convergence of national policies to internationally agreed goals (usually endorsed with the unanimity principle). This core attribute has again process and content related implications. On the side of the process, it is of interest the degree to which IOs are able to establish forms horizontal (intra-state) and vertical (inter-state) forms of institutional coordination. Concerning the content of states engagement, the matter is reflected in the capacity of IOs to mobilize MSs to a common strategy for development –i.e. the SDGs, providing fundamentals principles of convergence to national policies.

2. CITIES AND IGOS

A meaningful entry point to the matter of urban development, planning and intergovernmental organizations lies within sustainable development and cities. Sustainability, and in particular its sustainable urban development sector, is a field which both the IGOs and planning theory have faced since the 1970s, in particular, since the 1972 UN Conference on the Human Environment. The planning discipline has been responsive on the matter of urban sustainability very early on when IGOs introduced such topic in their agendas, for example exploring the contradictions and directions of planning of cities in the mid 1990s at the crossroad among more environmentally sustainable strategies, programmes to promote the economic growth in cities, or strengthening social justice and cohesion (Campbell S. , 1996), while it should be noted that the planning debate soon moved to the urban dimensions of sustainability (i.e. (Wheeler & Beatley, 2004) for a comprehensive review) thus focusing on: land use and urban design, transportation, energy and materials use, spatial economic development, green architecture, and to the research of measures for their improvement.

The linkages between IGOs and planning were not just established on content related matters. Two main streams of scholarship have developed: the first establishing frameworks and common understanding of urban sustainability and its strategies and tools (Beatley, 1995); (Camagni & al., 1996); Wheeler, (Wheeler, 2000); (James, 2014)); the second, a more technical design and guidelines as well as reporting indicators for green cities (Beatley, 2012); (Jenks & Dempsey, 2005); (Bell & Morse, 2008). Technical contributions from urban studies authors have supported constantly more broad policy frameworks to innovate public policy.

Measures for sustainable development taken at city level are crucial to mobilize expert and sectorial knowledge and tools (i.e. planning tools) to support and implement political commitment and societal engagement (Breheney, 1992).

In the intergovernmental arena, urban development reached the international debate in the 1980s (considering the report "Our Common Future", (1987), as the follow-up to the UN Conference on the Human Environment). The contribution of urban growth to achieve sustainable development is critical (UNECE, 2012).

Since the first decade of the XXI century the majority of world population lives in cities. (UNDESA, 2014) reports 54% of global population will live in cities (2014). It is important to recall that urbanisation and agglomeration processes are very complex and

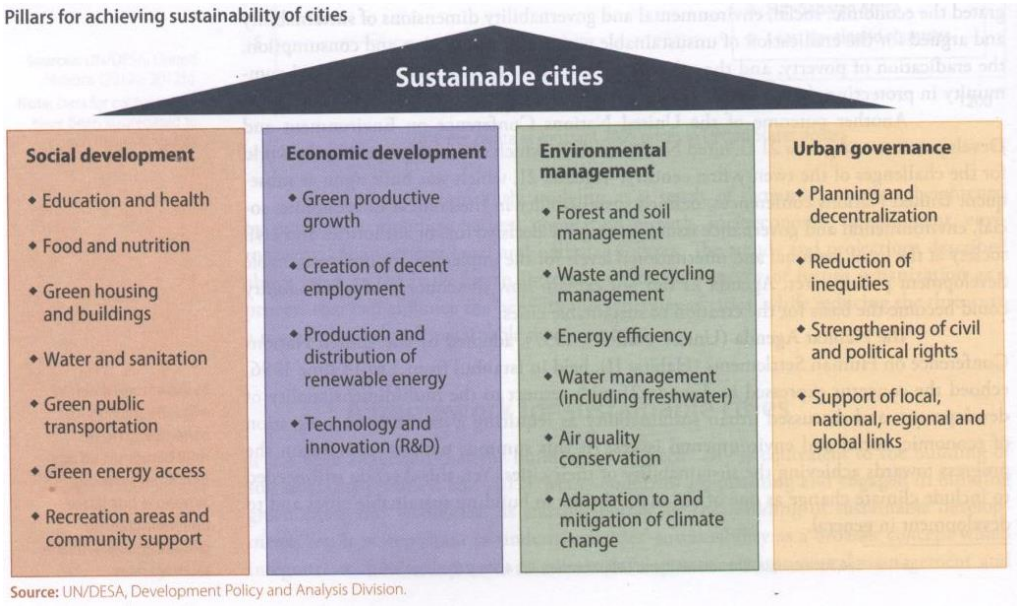

Figure 1. UNDESA pillars for sustainable cities

through their spatial dimension, generate economic and social benefits, innovation and societal progress.

Urban dynamics, in fact, touch all four areas of sustainability, including culture. In addition, the spatial and physical dimension of urban structures, are rather rigid and characterized by long lifecycles. This put the stake of decision makers on sustainability of cities, and also on the opportunities for building sustainable human settlements (United Nations, 2012). The latter also recognise that the building of a "green" city is equivalent to the building of sustainability (Beatley, 2012).

It is important to note that the opportunity to effectively make the best use of urban development trends is often put at risk by several factors. A first element resides in the complexity of these processes, and their mutual linkages; the second, and probably most important, concerns the capability of urban governance to adequately cope with and respond to these challenges.

In 1991, the Sustainable Cities Programme (UNCHS) provided a first definition of sustainable city as "where achievements in social, economic and physical development are made to last" (United Nations Human Settlements Programme, 2002). The definition above, while being in line with the Brundtland Commission definition of sustainable development , was unresponsive to the need of limiting the environmental footprint of human settlements.

The preparation of Rio Conference on Environment and Development in 1992, promoted the reflection and analysis of urban conditions. UN GA resolution (A/RES/66/288, 2012), better known as Rio Declaration, was clarified with a specific section the role of cities and human settlements. Points 134 to 137 of the Declaration are dedicated to the principles of urban sustainability in accordance to the three pillars of sustainable development. This long term strategy however provided MSs with no action oriented materials; Agenda 21 too, did not explain how the principles of sustainable cities could be translated into measures. The Agenda instead, achieved positive results engaging local authorities and citizens to build awareness on the outcome of the Rio Conference.

In the second part of the 1990s nations reported on the progress towards achieving more sustainable cities at the Habitat II Conference (UN Conference on Human Settlements), held in Istanbul in 1996. The conference also adopted the Habitat Agenda that still did not include climate change as one of the threats for cities (United Nations, 1997).

The most recent events (World Urban Forum 2002, World Summit on Sustainable Development 2002, and Rio+20) have consolidated a framework for the achievement of sustainable cities. The framework is structured around four thematic pillars: social development, economic development, environmental management and urban governance.

3. CHALLENGES AND PRIORIES IN THE IGO URBAN DEVELOPMENT DIALOGUE

The following section focuses on the key elements of the debate among scholars on the matter of cities and global agreements. The synthesis of the following key themes is the result of an extensive literature review considering the issues of a

selected sample of journals over the past ten years (2015-2005) and it is based on a few more than one hundred contributions.

3.1 Decision making and implementation shortcomings

The first key theme focuses on the role of local authorities and public administrations (Satterthwaite, 2008) and 2005), and in particular, on the aspects which include the patterns of engagement and exclusion of stakeholder groups in decision making at global level. Central to this first argument is the divide which arises between implementation stakeholders (i.e. local authorities) and the world polity.

Several contributions and arguments in the global debate on development agenda used to focus mostly on macroeconomic elements, i.e. large increases in international co-operation and aid, debt relief/loans or national poverty reduction strategies, while the most exposed level of implementation stays at city level, in the role of local authorities and the required changes at public administrations in sectors such as: urban infrastructures (i.e. water and sanitation, heath care and education), financing and land management. The effectiveness and efficiency of local services and decision-making processes and the capacity to raise and spend money to improve citizens' welfare is considered the key aspect to make the difference between either unsuccessful/ partial implementation and temporary results (within the window of foreign or international assistance) or improved and long term capacity of local stakeholders and public bodies in the delivery of projects.

Local authorities and their decisions are the executive stage for investing international funds to transform comprehensive policy goals, such as those of the SDGs, into concrete actions and projects on the ground to end poverty, improve sustainability and offer adequate living conditions to most.

Next to the role of local authorities, a second set of critical issues in sustainable urban development as conceived in intergovernmental level, are the patterns of interaction, and certainly inclusion/ exclusion of stakeholders to the latter processes.

(Lefebvre, 2012) explains the role of local authorities (an implementation player) in the preparatory phase of global agreements. Using the climate change agreements as an example, cities are key players for at least three reasons: the density and spatial organization of consumption facilities (i.e. buildings, transport networks, goods consumption); second, the need of local coordination to implement emission reduction plans; and third because the endeavours to limit climate change may not be only concentrated at high levels (i.e. state level) but requires control and engagement of an intermediate institutions. However, the same agreements do not contain binding obligations directly upon cities. The institutionalization of city involvement has followed two main directions: the first, related to the legal status of cities in negotiations, the second to the contribution of cities to climate change agreements. While the climate change agreements (Kyoto and UNFCCC) attribute to cities an important role and responsibility in addressing climate change, there are difficulties for cities to join the negotiations in a substantive way. Cities are faced by three main concerns, first to be recognised for their critical role in achieving GHG emissions reductions; second to be supported in their actions ranging from capacity building to carbon finance and technology transfer; third to be included in consultations and negotiations on climate related policy formulation as proactive stakeholders.

The difficulties of cities participation are multifaceted. On one side the demand of cities is to add a new category of stakeholders at a new level of power to overcome the contradiction expressed above: cities are meant to be important by the agreements but the assistance to this level for implementation and the role of these actors in negotiation is not institutionalized or substantially formalized. On the other side, following the second direction hinted above, the nature of cities involvement is limited to the capacity of cities to act on specific climate related targets (and therefore the capacity of local authorities to coordinate with national commitments and pursue long term strategies, often conflicting with the logics of mayors' selection), the limited scope and territorial extension of cities, but it is also rooted in the UNFCCC preamble. With respect to these difficulties, a fundamental role is played by associations and city networks such as ICLEI, UCLG and Metropolis that strive to tighten the gap between global norms and the local level, and therefore between policy making and implementation.

However, it is important to point out that the past cycle of intergovernmental agreements lacked of a strong involvement of local authorities and clear targets for cities. The new season of documents, first of all the new set of Sustainable Development Goals, include several goals with a focus on cities. At the same time a wide consultation process is taking place involving all societal sectors. It is partially

frustrating to point out that the selected journals over the considered time frame did not host any disciplinary debate on the 2030 Agenda or related agreements.

3.2 Urban planning and IGOs dialogue in a political science perspective

The second group of issues, certainly not independent from the first set, focuses on the linkages between planning and IGOs as institutions and in the ways in which IGO provisions are shaping the planning discipline, and may lead to a disciplinary renewal.

The content of intergovernmental agreements and the global norms, might not be necessarily so effective and relevant for planning, but these agreements have a "distinctive urban character" and could be seen as occasion to strengthen the relations between "global norms and planning forms", therefore to align planning practices to the need of environmental sustainability, poverty eradication and the capacity of IGOs to drive "international socialization" around priority themes (Giovannini, 2008); (Finnemore & Sikkin, 1998). Global agreements in fact can be identified as a "global social contract" to put into question some vicious forms of planning and urban development that have generated the urban problems the agreements try to revert (i.e. inadequate living conditions in slums, lack of urban infrastructure and access to basic services for some resident groups, environmental risks and low environmental performance of settlements etc,). Norms in international contexts refer to the ideas, principles and moral values and standards of state behaviour defined as rights and obligations (Krasner, 1983) developed in a context where states aim at increasing their own ability to maximise domestic pressures while minimizing the adverse consequences of foreign development (Axelrod, 1986).

The intergovernmental arena is also challenged by emerging collective expectations of states' behaviour, especially to address the matters where a single state lack of interpretation capacity, legitimation or simply scale capacity. This matter has mostly to do with international institutions and the procedures of international regimes, given the different levels and degrees of normative standard capabilities and agenda setting influences (Simmons & Martin, 2002).

The importance of socialization and agenda setting is also related to the capacity of IGOs to introduce new topics in the field of common goods management like the environment and accordingly to sustainability (Ostrom, 1990). Some authors in the field of international relations and political science consider IGOs as drivers of "norm cascades", referring to the escalation of consensus on some new positions, transforming desired conducts into "standard behaviour", as consequence of a growing number of states adopting or supporting agreements at international level, i.e. on climate policy or on human rights (Wendt, 1999), (Finnemore, 1996); (Katzenstein, 1996). This argument plays a relevant role in the field of agenda setting, especially considering the impact of global norms on national contexts.

While the role of local non-state actors is acknowledged to increase the effectiveness of project design and implementation and to better catalyse development assistance funds made available by development banks, the deal for meeting the global agreements is made by the public administration sector at local level. This argument is made by two tiers (partly related to the first set of issues identified above): first, the authorities need to improve their responsiveness in the administration procedures to operationalize projects, allow practices and initiatives, but also to monitor services delivery by making basic service providers more accountable. This first aspect requires the development of new and stronger local organisations skills for urban management. Second, attaining an inclusiveness principle, the groups of poor citizens and their organisations – i.e. the federations of slum dweller, should be fully considered in the decision-making process and actual driver of projects for change. These two, major, changes called by Satterthwaite (2008) would allow to facilitate the evolution of development assistance to a more close-to-poor level and empower local development assistance organisations to implement projects to improve quality of life of urban poor – the main goal of MDGs. This framework -where local authorities can manage and address local transformations, and grassroots associations can propose initiatives and implement them, reverts the traditional "foreign" development assistance which relies on state level debt relief mechanisms, development banks and NGOs. However these institutions are supposed to be less familiar with local contexts and less keen to develop specific place based responses to poverty in disadvantaged urban situations.

These changes would open up to the opportunity to innovate the way in which development assistance is delivered, rather than only in the ways it is conceived in IGOs arenas.

Another important argument is introduced by Neuman (2012); he refers to planning as an applied field of politics and sociology in which planning governance is strongly bound to institutional settings, agendas and political cycles meant to inspire, adopt and set the procedures of the planning process, whereas the institution is defined as the structure able to order social behaviour according to accepted norms and therefore to improve the effectiveness of cooperation on spatial planning aspects in institutional settings.

The lack of effective intergovernmental coordination for spatial planning and growth management is frequently cited ((Albrechts, Alden, & ., 2001), (Alexander E. , 1993), especially considering that planning lies between broad social arrangements –i.e. markets and governments, and single organizations – i.e. municipal planning agency, has specific spatial polity – i.e. a city, region or state, and it is configured as a multiorganizational construct spanning several spatial scales (Neuman, 2012). The latter linkages between planning, institutions and sustainability have been further explored by Steele (2011). While a broader study on institutional changes in the face of sustainable development has been proposed by Connor and Dovers (2004) and argued about an intensification of institutional changes – quasi incremental, rather than deep institutional reforms; Steele, focuses on the institutional approach to planning. First he argues that planning for sustainability promoted the shift of planning systems and plans to more performative and "strategic flexibility"– rather than conformative, settings. Furthermore, the recent institutionalism studies surfaced the role of decision-making patterns, especially with regard to spatial strategy making in complex and evolving governance landscapes. Steele also introduces the emerging "strategy making for sustainability" developed under the influence of the studies of Healey (2007) on spatial strategy making and Connor and Dovers (2004) on institutional changes to address sustainability (reflecting on the institutional accommodation of a sustainability discourse, normative change, legal change, and international law and policy as driver).

3.3 The opportunity of urban planning as implementation tool

A last important element on planning and institutions, by Matthews (2013) (building on Faludi (2000), Forester (1989) and Alexander (2005)), attributes to planning a key function to bridge between territorial transformations and the compliance with, and implementation of, intergovernmental agreements on sustainable development. Planning involves the coordination of development activities and the governance practices for developing and implementing strategies and policies determining the location, timing and form of development; more precisely "planning regimes act to regulate development activities and [...] the social outcomes relate to the institutional governance of spatial and land use development" (Mattews, 2013).

Often at times, as noted by Connor and Dovers (2004), institutions are able to incrementally or radically evolve to set the enabling conditions to cope with emerging needs, therefore to facilitate planning procedures and responses. According to this perspective planning assumes a connotation of public tool to be deployed for addressing the priorities of governments and administrations (i.e. those included in development strategies). Given this framework and the attention paid by IGOs to our discipline the responses shall be adequate. The linkages between politics, government priorities and urban development determines much of the capacity and interest to develop public-public partnerships (horizontal and vertical integration and coordination of public authorities, bodies, and financing institutions) and design urban development programmes.

4. UNCERTAINTY AND DIFFICULTIES OF PLANNING AS OF TODAY

Urban planning is a very wide field of theories and practices. The traditional birth of planning dates back to the XIX century, in response to the unhealthy and unsafe human settlements conditions generated by the rapid growth of industrial cities, especially in Europe.

Effectiveness, over time, of statutory systems has been put into question (Healey, 2009) for at least two main reasons. First, rigid systems proved to be only partially able to respond and capable to adapt to urban dynamics. Second, the governance of these latter processes became dominant over the traditional responses provided by planning documents, statutes and authority.

Urban planning, and its traditional tool, the plan is a specific type of public activity to regulate, address and coordinate the transformations of a given territory (Moroni, 1999).

Traditionally, urban planning practices, especially in some parts of the world, were based on statutory documents (the city plan) to address simultaneously mid-term development provisions, and procedures to manage urban transformations. Planning

systems may considerably vary across countries, being strongly related to the States' organization, levels of power and degree of decentralization. Urban plans are regulatory instruments and consist of public acts regulating behaviours for the use and transformation of land. Decisions dealing with land-use are intrinsically conflictual (Forester, 1987).

Contemporary city making often requires procedures and instruments that city plans do not manage at their best. The increasing need of flexibility in planning documents and the opening to discretionary planning systems has surfaced a governance and policy dimension of planning. The complexity accompanying the territorial development process has reduced the urban plan to one among many tools to be deployed. In addition, the focus of planning moved towards a territorial development approach, in which the process of governing a territory was conceived as the action-oriented interaction among groups of stakeholders (including social groups, institutions, and economic forces) to address a collective problem (Magnaghi, 1981).

This dimension, taking note of the fact that territorial development decisions cannot be reduced to planning acts (the plan), required a much stronger integration, interaction and coordination between the state (and its level of powers), society (involving stakeholders' participation in the decision making process) and the public administration (as coordinator of the planning process) (Palermo, 2009). The discipline evolved towards three main streams, the one of urban policy, the governance dimension and the spatial planning paradigm.

5. PLANNING AND IGO TODAY

The evolution of planning practices towards the harmonization and strategic synthesis of territorial strengths into development strategies has built a very strong connection between the discipline and IGOs activities. Several IGOs in fact have specific competences in the development, policy and governance fields. The degree of competences and enforcement capacity varies considerably. Most of these organizations act under the principles of inter-governmentalism (Garrett & Tsebelis, 2001) and therefore might have limited binding/enforcing powers with respect to sovereignty and authority of national states.

For example most public policies, are part of the world of overlapping powers within the global and regional (such as European) governance in the making: municipalities, metropolitan authorities, regions, federal states or autonomies, the nation state, the EU ,the OECD urban group and the UN (Habitat Summit) with international rules comprising environmental norms, can all play a role in urban policies (Le Galès P. , 2011).

Le Galès (ibid.) reports an endless number of urban and territorial polices being shaped at international level. This reflects the relevance of commitment taken by the international communities on programmatic and long term-strategic agreements. Accordingly, the stake of decisions included in international agreements described earlier, does play a substantial role for the future of urban policy and territorial development trends, as those will set the principles of national policy alignment/ convergence. This element if endorsed by national planning associations and practitioners, and by national government (as signatories of the global agreements) can drive a major changes in the planning discipline, overcoming disciplinary failures to reframe its discourses.

IGOs in synthesis prove to be effective in the broad patterns of interaction states build to overcome the trade-offs between interdependencies and co-operative behaviour and interdependence costs of autonomous action (Ruggie, 1998).

By consequence, the room of intergovernmental co-ordination is rooted in the trans-boundary policy interdependence, and most of all in the externalities produced by national policies and behaviour, for example with regards to environmental impacts.

What is more, the achievement of global targets (i.e. SDG 11: make cities and human settlements inclusive, safe, resilient and sustainable) goes hand in hand with national policy commitments. This nexus is strongly rooted in the subsidiarisation of public policies ((Kazepov, 2008); the Treaty of the European Union, C 326/15 –principle 4) and in the nature of the level of challenges to be addressed. Individual and un-coordinated actions in the field of climate change would deliver limited and unfair payoffs to individual states. The capacity of sub-national governments to make the right investments and deliver public services for both growth and inclusion remains a core issue in development efforts ((OECD, 2009), (2011)). Other than the challenges of policy co-ordination within and among states, a relevant point of concern (Stead & de Jong, 2009)) considers the possibility of policy transfer across countries.

The objective of these efforts can be resumed into two main families: the first, which targets

are developing countries, tends to promote the translation of the operational principles (i.e. allocation of competences, policy design principles, etc.,) into the institutional and planning reforms. These efforts are intended to set the systemic conditions to develop effective, sound and well functioning territorial development policy and planning. The second target group is represented by the wide set of countries in which planning is already institutionalized and part of public policy, but where efficiency of the system can be improved by promoting improved co-ordination of levels of power and enhance the institutional capacity of problem setting (Dente, 2014).

In addition, the intergovernmental framework for territorial policy can boost the convergence of national policies to achieve supra-national targets (i.e. territorial cohesion in the EU, or sustainable development in a global context).

Furthermore, next to the capacity to support MSs in policy, institutional challenges, and project implementation, IGOs can host the negotiation of intergovernmental agreements that set programmatic strategies to which MSs align national policies; this is the case of UNFCCC, SDGs, Post-2015 framework for DRR and Habitat Agenda.

The unmanaged urbanisation occurred in several developing countries over the last half century has posed serious challenges to social equity prior to the ones related to unsustainable settlement environmental footprints. This fundamental element has given the mandate to the world polity to consider the urban implications of sustainable development. Much of the IGO debate on cities however remains at policy input level and at international development assistance, this latter often put into question for being rather far to real problems on ground and providing some aids in the field of finance (i.e. debt relief) instead to act on local capacity to coordinate and manage the development process itself, as noted in the limitations related to local authority's capacities.

Regional institutions are able to strongly shape the nature, content and impact of global agendas while the local level keeps the lead for implementation.

IGOs have in fact increasingly addressed the matters of –sustainable- urban development with measures targeted at city level or dealing with cities, shifting from policy integration to some degrees of spatial focus. Given this framework, cities become the target but also a stakeholder of these processes, while their inclusion in global decision making has reached in the 2030 Agenda (and related thematic agreement) to a notable degree.

This is particularly evident when the global politics of sustainability in the urban age is concerned. City diplomacy refers to the "institutions and processes by which cities, or local government in general, engage in relations with actors on an international political stage with the aim of representing themselves and their interests to one another" (Pluijm, 2007). The transformations in the contemporary diplomacy are mostly due to globalization processes and their clearly distinctive urban implications, which have led to the fading of national boundaries and to a redistribution of responsibilities between states and non-state diplomatic actors. Patterns of interaction and actors of the urban intergovernmentalism have consequently changed, however with the difficulty of several IGOs –UN-Habitat and UNDP first and a set of other IGOs given limitations in the IO mandate, to engage and get into cooperative relations with cities. Some forms of cities coordination networks, i.e. UCLG, ICLEI and C40 have supported the consolidation of new forms of decentralization of international relations towards the city level.

Next to this tendency it also emerges a strong emphasis on a comprehensive and integrated approach to spatial planning both supported by organizations' studies on policy coordination and cooperation and by some other reflections within the planning theory. These converging positions match to sectorial forms of coordination, i.e. on sustainable urban development, by setting common goals and intermediate targets and establishing formal forms of partial coordination (where countries commit to cooperate in achieving certain targets but may aim at other targets uncooperatively). Spatial planning therefore emerges as a public tool to put into coherence sectorial policies with a clear spatial focus, with this tool development agendas are translated into a spatial dimension and into actions at local level. Given this framework planning is strongly concerned in the adaptation and translation of policy goals defined at international level to a more manageable dimension of action, the city.

6. CONCLUSION

From a disciplinary planning perspective it is important to note the faith that IGOs have placed on human settlements as key tool to win development goals. It is also fundamental to acknowledge the amount of urban related debate, policy making and monitoring that is taking place at intergovernmental level, planning stakeholders, necessarily shall

contribute to these efforts.

Indeed planning tools are required to deliver and perform as the challenge is won or lost in cities, where planning instruments are focused. The mobilization of an unprecedented political commitment, societal engagement, funding and partnership around cities and urban development puts urban professionals at the very core of the 2030 Agenda. On the planning side, however the uncertainties and the series of unsuccessful results of the last century cannot be neglected.

Certainly, much of the implementation capacity stays at the national and local levels, where domestic legislation to manage urban planning practices must be efficient under the supervision of trained and accountable professionals. The UN-Habitat Guidelines for Urban and Territorial Planning can support public administrations and national governments to facilitate the reforms and therefore to align to the need of the discipline to effectively catalyse the global momentum, its financing and commitment to start a new season of sustainable urbanization and to deliver adequate living conditions and quality of life for all.

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[I] Sustainable development: development that meets the needs of the presents, without compromising the ability of future generations to meet their own needs (Report of the World Commission on Environment and Development, 1987).

[II] The literature review of urban planning journals has first developed from the current ranking of journals as provided by SCImago Journal and Country rank. The selection of the sources based on journals' impact factor (in 2014) intended to point out two set of issues: first, whether and to what extent the most cited journals publish contributions dealing with the activities of IGOs and therefore which is the attention paid by planning debate to IGOs; second, which attention has the planning debate paid over the last ten years on the activities and provisions of IGOs on cities and human settlements, and especially which kind of debate has flourished, if any, in concomitance of milestones of intergovernmental agreements regarding cities. Given their impact factor, the Journal of Urban Economics and the International Journal of Urban Education and Research have been chosen. A second set has been driven by geographical focus, therefore the journal selection accordingly considered: the Journal of the American Planning association and Planning Theory and Practice. An additional set of three journals intended to explore an eventual attention of more sectorial publishers towards the themes of interest to this study, it was accordingly chosen: the Journal of Planning Education and Research, Environment and Urbanization and Regional Science and Urban Economics. A final set of additional journals has been considered. The complete study is hosted at
https://www.politesi.polimi.it/handle/10589/113103?mode=full&submit_simple=Show+full+thesis+record

The contribution of risk relations to urban planning practices: rethinking floods and other natural disasters of anthropic synergy

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Based on interpretative tools from epistemology of risks, an adjustment was made on the typological categories set traditionally used to understand the processes involved on urban flooding risk. A generic Brazilian urban system is described through representative diagrams of elements and variables arranged to underline risk relations. The representative models presented in this study highlight a usually neglected aspect on environmental risk management: the structural connections among social and environmental vulnerabilities with the magnitude of natural hazards.

1. INTRODUCTION: THE AMBIGUOUS NATURE OF URBAN FLOODING

The effort to understand risks leads us to the search of typifications that enable practical distinctions in a broad universe of threats. In presenting the theory of risk society, Beck (2010: 362) distinguishes nowadays' uncertainties from the typical dangers of ancient times. Being risk a modern concept, we refer to the diseases, the wars and the epidemics of the past simply as "threats." For "risks" differently, we assume the involvement of human decisions and humanly produced futures. Therefore, neither natural disasters, attributed to divine will or to the forces of nature (threats) nor the calculated uncertainties, insurable for monetary compensation, reveal the nature of this modern category: the "manufactured uncertainties".

The manufactured uncertainties are the protagonists of the threat landscape in late modernity. They also depend on human decisions, but are imposed collectively, in a way that the individual cannot avoid them. They are not externalizable, calculable, manageable or insurable privately, because they break with the past experience and with the routine responses. Other authors are less rigorous about this historical issue and make use of a timeless taxonomy of risks. Dagnino and Carpi Junior (2007) distinguish four macro classes: natural, technological, environmental and social risks. These categories are not mutually exclusive, on the contrary, are superposed, but virtually prove to be useful to demarcate groups of various kinds.

Natural risks, by definition, encompasses uncertainties whose social construction comes from a physical process sensed, perceived and experienced by a given group. Veyret and Meschinet de Richemond (2007, p.64) subdivide them into risks of lithospheric origin and of hydroclimatic origin. Earthquakes, landslides and volcanic eruptions identify the physical processes of the first group. The second includes impacts caused by cyclones, storms, intense blizzards, heavy rain and hail or droughts. Rebelo (2003, p. 11) refers directly to tectonic, magmatic, climatic, geomorphic and hydrologic risks, choosing hence for a less hierarchical treatment. One way or another, the uniqueness of natural risks lies on the physical causes of these events, which are largely beyond human intervention. Sevá Filho (1988: 82) calls them telluric risks (relative to Earth) and adds to its description an aspect of globality and uncontrollability which reveals our human fragility front to such fortuities.

Concerning the social or societal risks, Vieillard-Baron (2007: 276) draws attention to the customary inaccuracies in the use of these concepts. There is a polysemy closely associated with the expression "social risk" that derives from the very notion of risk. If we define risk as the perception of one or more individuals of the occurrence of a threat and vulnerability as a necessary demarcation of the human dimension of risk and the extent of the damage, we can say that all kinds of risk entails human consequences. Such ambiguity also calls into question the category of natural risks, since there is no risk free of social construction. However, these notions have been widely used and to now request a

new terminology would mean adding a complicating factor to a scientific field still in consolidation. On the other hand, such redundancies may, nevertheless, be settled from the explanation of the meaning intended to the terms.

As stated, natural risks would be those types which its causes escape largely to human control. In this line, social risks are qualified as those which anticipate the probability of a catastrophic event for the human community, with harmful consequences for society, whether as a whole or in part. Therefore, we consider society as a whole, whose foundation is solidarity. Social risks in this way are distinguished from others not by their social causes, but by the social consequences of threats from any source. When the living together or the social cohesion are targets, one is dealing with social risks.

Historically, this field of study has focused on the investigation of perceptions of insecurity and of violence, two recurrent threats in urban environments. Thus, it is about delinquency and criminality risks, risks associated with drug use and drug trafficking and those linked to totalitarian ideologies, war and terrorism (Vieillard-Baron, 2007: 275). Put like that, it is understood why scholars of social risks subdivide them into exogenous and endogenous. Once a social risk is recognized by its consequences, in a sociocentric vision, we perceive the natural causes of a hazard as external factors (exogenous risks) and causes of hazards relating to the functioning of society itself as internal risk factors (endogenous risks).

The diversity of approaches in classification of risks are huge and, in our attempt to conceptual organization, we will horizontally place the categories relevant to this narrative, without, however, preventing them from communicating. The interaction between categories of classification is a prerequisite for the existence of synergy between the risks. This will be our focus further. Pinto (2007) proposes a taxonomic treatment whose subcategories we will allocate under the umbrella of anthropogenic risks. Comprise this framework the built, productive and cultural risks (the author refers to social risks, but we will make an adjustment to avoid conflict). Naturally, in a general and imprecise way this macro-class of risk includes threats with causes essentially anthropic: economic and cultural transformations of the landscape.

All kinds of changes and structural human intervention in the natural environment (buildings, river canalizations and rectifications, paving and sanitary infrastructure installations that offer threats to the inhabitants by locational and technological inadequacies) will be associated to building risks. Changes caused by cultural traits that result in damages to the communities (such as burning practices or removal of riparian forests for crops) constitute cultural risks. Finally, shall be designated as productive risks those related to threats from industrial activities in any stage of the productive chain.

Productive risks, also known as industrial and technological risks, are associated with deleterious effects induced by accidental or chronic pollution events (slow and diffuse) resulting from activities of production, storage and transport of hazardous materials. Veyret and Meschinet de Richemond (2007, p. 70) distinguish a specific group they call major industrial risks. Threats sources of these risks are: explosions, toxic leaks and fires. Those are risks of low probability of occurrence but often catastrophic and easily able to rebound on threats to the collectivity (social risks) and to the constituted powers. Although deserving special attention, nuclear risks are a type of what we will name as higher productive risks.

Beside the anthropogenic risks, we will position the economic risks. The specificity of this group lies in the perception of consequences related to the management of scarcity. The strategic choices of national economies and companies that commercially explore resources (renewable or not) subject dependent populations of these goods to uncertainties in terms of provision of needs, and the more vital are those resources, the more easily these uncertainties tend to translate into latent or open conflicts. Water, land and oil are examples of resources on which national and international conflicts have historically orbited. Here are also included market risks associated with investment decisions and cutbacks usually motivated by competition. The possibilities of gains and losses involved in these decisions depend on an intricate network of economic agents and price fluctuations that often escape the control of the decision makers. Not rare the economic risks engender social risks too. For example, in agribusiness bad choices can materialize in food insecurity situations and in general, for all sectors, can result in financial insecurities that withdraw credit and consumption, generate unemployment and systemic disturbances.

For the outcome of this classificatory venture, we reserved two meta-categories, which cannot be treated on the same level as the others: the group

of health risks and environmental risks class. Many of the risks presented bring, to some extent, harm to the integrity of individuals and to social groups. Whether material losses, deaths, physical injuries, psychological injuries or illnesses, ultimately, the injuries are reflected in terms of health. Pollutions, responsible for the perception of the productive risks, contamination of food and water sources, multiple insalubrity supported in the workplace; incivilities, war and urban violence in the context of social risks; collapse of constructions and landslides in steep areas on the built risks; and all sorts of human frailty called into question against the disasters associated with natural and telluric risks are examples.

Health risks are the result of a secondary reflection on the risk spectrum compression presented so far across different causes and consequences. As each organism responds in a very unique way, for every situation it will be made the question: which health risks arise from the primary risk considered? Only conducting risk assessments to this last step, we may take farsighted decisions about the degree of acceptability of threats to which we expose ourselves.

As from this consideration regarding the refinement of possible analysis in terms of impact risks to buen vivir and to the quality of life of the communities we present the comprehensive concept of environmental risk. For this category, we rely on the environment concept as conceived by Leff (2007), for whom this entity means, first of all, the space proper to questioning the limitations of disjunctive operations, procedure we did earlier in the didactic understanding effort of the risk categories universe. To Veyret and Meschinet de Richemond (2007, p. 63) environmental risk is the perception of threats associated with natural hazards and risks from natural processes compounded by human action or simply by the occupation of the land. In this paper, we will take this definition in a broader perspective, in which the environmental risk will present itself whenever we notice patterns of interaction between the primary risk categories presented. Afterwards, we will outline some of these possibilities of interaction.

2. RISK RELATIONS

A subcategory of natural hazards not shown in the above classification panorama was actually reserved for treatment apart. These are called natural risks aggravated or caused by human activities. Veyret and Meschinet de Richemond (2007, p. 67) define them as arising from events whose expected impact becomes more dramatic due to the practiced forms of use and occupation of the territory. In this class are grouped together risks associated with: susceptibility to erosion, desertification, droughts, fires and pollution.

Fires in urban or rural green areas or in protected forests result from the frequency of activities in the forests and in the surrounding areas. The installation of campsites, vacation homes or even sporadic forays into the woods for hunting or resource extraction, for example, constitute risk factors in these areas. Fire hazards are enhanced when these incursions occur during drought periods, depending on the preventive measures adopted by visitors, the compliance with the safety standards and the types and levels of management of these areas.

Similarly, pollution risks are discussed here from the point of view of injuries resulting from use. In this case, as a result of abrupt variations in the demands imposed on a given support infrastructure. The inadequacy of supply, transportation, sewage, collection, disposal and adequate management of waste systems to high seasonal demands leads them to collapse. The increase in the flow of visits to tourist sites in high season periods or due to traditional major events generally extrapolates the treatment capacity of the wastewater. This then becomes a recurring picture: with the arrival of rains, the effluents conducted in incomplete separation systems easily attain the waterways, polluting them (Veyret & Meschinet de Richemond, 2007: 69).

In turn, the acceleration of erosion, droughts and desertification are seen as naturally occurring processes in arid, semi-arid and dry sub-humid areas, even if induced or exacerbated by human action. The importance of the human contribution to this phenomenon has grown tremendously with the scenario of uncertainty announced by the ongoing climate change:

Past mistakes, ill-conceived policies and predatory practices have resulted in social and environmental conditions that cannot be easily reversed without substantial and constant development efforts, requiring increasing national and international financial support. The diminishing productivity of natural resources in drylands, the prevalence of poverty and significant inequalities and also institutional weaknesses, should worsen with the increase of variability and climate change. (...)

Extreme weather events in many parts of the world – recent floods in Pakistan, fires in Russia and

Indonesia, sandstorms in China, erratic behavior of the Indian monsoon, drought and food deficits in sub-Saharan Africa, prolonged severe droughts and lack of water in northern Mexico and northeast Brazil among other disastrous events elsewhere – underscore the urgency for governments to prepare for an uncertain climate in the future2. (Declaração de Fortaleza, 2010).

Drought, as well as specific expressions of erosion, produces effects of desertification, but the phenomenon itself is identified when there are traces of irreversibility in short and medium term on the changes in the landscape. Desertification therefore means an in-depth picture of soil and vegetation cover degradation with sensitive impairment of the biological potential. Common causes are related to poor management of natural resources (e.g., excessive use of pastures, logging and other forest resources beyond the replacement rate or inadequate soil management), mismatch situation between demand and capacity provision, which droughts often only help reveal (Scheffer et al., 2001).

Once presented natural risks aggravated or caused by human action, we can ask ourselves what are risk relations. Well, considering the probabilistic nature of the concept of risk, investigations into interactions between groups of threats placed in different categories should turn to a deeper systemic understanding of interactive expression patterns of crises. The question is now presented differently: to what extent does a well-established risk class have its manifestations in crisis aggravated, anticipated, damped, nullified or succeeded (as trigger ignition) by another risk class?

As a pattern of threats, effects, exposure situations and vulnerabilities becomes better understood, naturally is founded around these factors a new risk class and, from then on its constituent elements begin to be perceived according to the operating structure studied. Let's check how this process can interfere with the apprehension and on a farsighted consideration of a risk situation closer to the complex reality and, then, apply this approach on understanding the interactive patterns associated with urban flooding risk.

2.1. A seismic-social risk interaction case

In 1999, the Turkish city of Izmir, 150 km far from Istanbul, witnessed a 7.4 magnitude earthquake. The seismic shock caused between 17 and 30 thousand deaths, required international assistance and exposed the weakness and the lack of mechanisms to prevent the tremors impacts on Turkey. After the disaster, gained momentum in the media a speech contrary to the social effects of earthquakes in order to prevent social and urban risks, since the previous frame of improvidence would open space for political representation loss in order to riots and risk of autocratic intervention (Vieillard-Baron, 2007: 309).

The measures adopted in the post-crisis revealed a paradox between the hegemonic discourse of restructuring delivered and the level of commitment to confronting the complex nature of urban risks. In general, the poor neighborhoods, whose informal edifications were raised in noncompliance to the paraseismic building standards, were the most affected in Istanbul. These communities, as expected, received the strongest knock of the crisis and were also those who found themselves most deprived of the means to rebuild and compensate their losses. That's how numerous civil protection, support to victims and neighborhood associations appeared or established themselves in the post-crisis (Pérouse, 2002).

Some of these associations were not established spontaneously, they were actually created by the municipal government. It was propagated, in parallel, the idea that the restructuring of Turkey was happening efficiently due to the common endeavor of society and in the name of solidarity that the earthquake would have allowed emerge. In the same year, however, the urban growth vector in Istanbul shifted to the safer outskirts of the city where closed communities were formed. Among the plans of government, stated the construction of pilot plants for 25 thousand inhabitants far from risk areas, with subsidies and attractive to industries and services (Vieillard-Baron 2007: 310).

Locations that were once considered good neighborhoods fell into discredit for being included in the risk boundary rays. In 2002, there were over 220 gated communities in Istanbul and the debate on how to live together in the city had given way to fear speech and to the ostensible confrontation of violence. Other outskirts deepened their stigma and its residents still suffer from social discrimination and from the difficulty of finding jobs.

From this perspective, the expression of seismic risk, the occurrence of the earthquake and the perception of chances of recurrence gave rise to a frenzy response to the improvidence situation that engendered speculation about social and urban risks. In the medium term, actions backed up by this

prevention discourse deepened a context of urban segregation and social division already present in Istanbul before the earthquake. From then on, it would assume the contours and proportions of a conflictual state, typical of a major urban risk.

2.2. Disjunctive or integrated analysis

We believe that this exposure on the risk relations was only possible due to a systematic and careful monitoring of the historical developments of the case in Istanbul. Otherwise, inadvertently, the same question could be analyzed in the traditional way, in two parallel and independent fields of study: one on natural risks and other on social and urban risks. Because each dimension has enough components to consider in its strict field, it would be practical to work separately without necessarily taking it as a very complex order problem and therefore worthy of mutual and multiple consideration.

What we would like to highlight in the case of 1999's earthquake relates to how the socio-spatial segregation intensifies and, paradoxically, goes to the background as the theme of natural risks is appropriated as a political instrument of moods mediation and to control electorate satisfaction ratings. The same goes for the media emphasis on urban violence as cause and end in itself. In this sense, Vieillard-Baron points out:

The origins of disasters – causes and consequences that are advisable to clarify to better understand the risks incurred by man – are multiple and often interdependent. A first approach shows that the causal chains that produce them become more complex over time and with economic growth, and that the territory is directly affected as a support of risks and as the major place of interactions3. (Vieillard-Baron, 2007: 275).

So, if we accept the complexity of these issues, we must also reject disguised shortcuts solutions which, as a rule, deepens the problems it intends to solve. The city, or rather the urban environment, is the place of excellence of overlapping risk interactions, because they concentrate a wide variety of landscape features, a wide range of land use demands and lots of development projects in dispute, as well as the range of targets and vulnerabilities distributed in space. Following this line, we intend to evaluate the depth of causal chains concerning urban flooding risk and to shift the commonplace of the current treatment within the isolated context of natural risks.

3. URBAN FLOODING: CLIMATE, PHYSIOGRAPHIC AND SOCIOECONOMIC STRUCTURING

On this section, we characterize the systemic relationships that underlie the problem of urban flooding according to the diagrammatic modeling method proposed by Berçot (2009: 58). The author emphasizes the potential of graphical representations in the exercise of drafting and redrafting research issues about social and environmental systems.

The diagrammatic representation models in this proposal must be built with elements that do not repeat in the system, represented by words or short

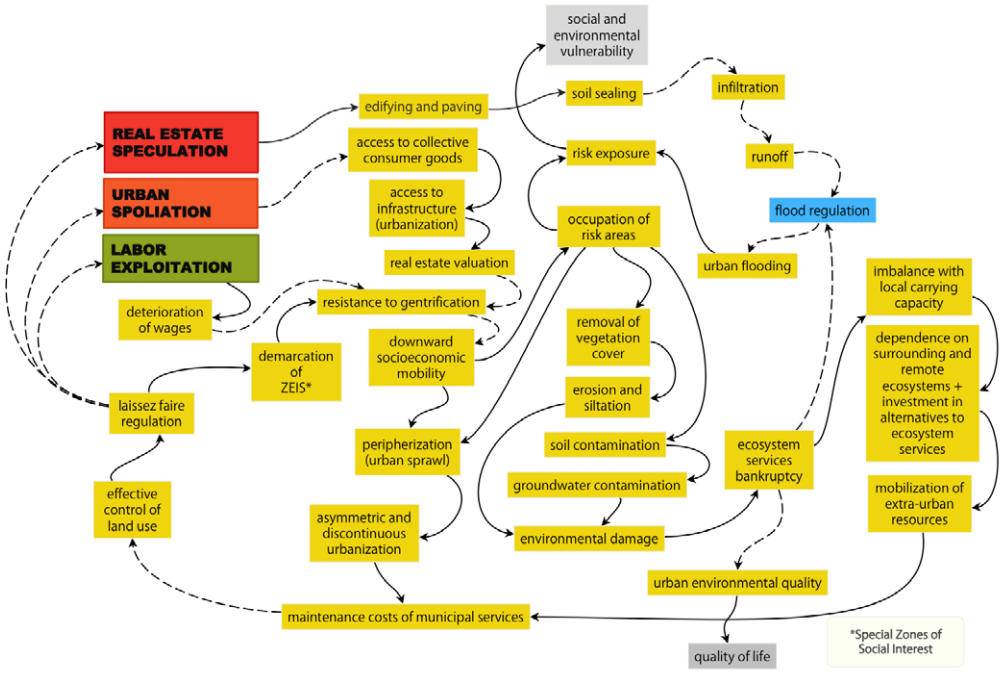

Figure 1. Direct relations (continuous) and reverse (dashed) between components of a generic Brazilian urban system. Font by the authors.

phrases (nouns, whenever possible, not followed by adjectives). In the conception of diagrams, the elements should be subdivided into common categories and their relationships represented by arrows. Continuous lines symbolize direct relations (positive) and dotted lines represent the inverse relations (negative). Finally, emphasis will be given to the identified feedback loops. Amplification cycles come in blue and stabilization cycles, in red.

As a starting point for the construction of the diagrams were assigned three key processes in the production of urban space: real estate speculation, labor exploitation and urban spoliation. The last concept was coined by Kowarick (2000) and it is about a sum of conditions that concern to the absence or precariousness of collective consumption services socially necessary for the reproduction of workers. The two other concepts we abdicate to explain given the wide usual semantic appropriation of these notions.

The general objective of the drawn diagrams is to generically represent the pattern of formation and expansion of a Brazilian urban system (Figure 1) fed by organic growth, so that it permits to link the mosaic of different uses and land occupations to the internal capacity of environmental services provision, namely the surface water drainage service (flood regulation). This dynamic is problematized based on the trend of increasing impervious surface plots of urban land. The more advances the building-paving binomium by removing vegetation cover and compacting the soil, the lower the infiltration capacity of rainwater and bigger and faster the accumulation in estuaries, intensifying floods and favoring waterlogging events and flooding (Figure 2).

The occurrence of flooding, such as the seismic risk areas in Istanbul, has dramatic meaning in an intensely disputed urban space. The chaotic growth of Brazilian cities through occupation of problematic areas (hillsides and flood plains on the banks of rivers and lakes) generates vertiginous deterioration of the environment and exposes its residents, low-income groups in general, to several threats. The irregular nature of these occupations and the negligence by the public authorities to the groups living there frequently prints patterns of unhealthy settlements, exposing them to serious environmental risk.

In the diagrams, we sought to demonstrate the dynamics of occupation of exception spaces and the critical character of the elements that influence the workers resistance of gentrification. Urban services maintenance costs provided by the public administration has deep relationship with the control that this same power has on the labor market (avoiding the depreciation of wages) and on the housing market (regulating real estate speculation and Laissez faire that leads to urban chaos and to the deterioration of local environmental services). Thus, the social, economic and environmental dimensions of the underlying conflict to the intra-urban space production are exposed as well as the trend of metropolis specialization as consumption centers of resources and ecological processes of the

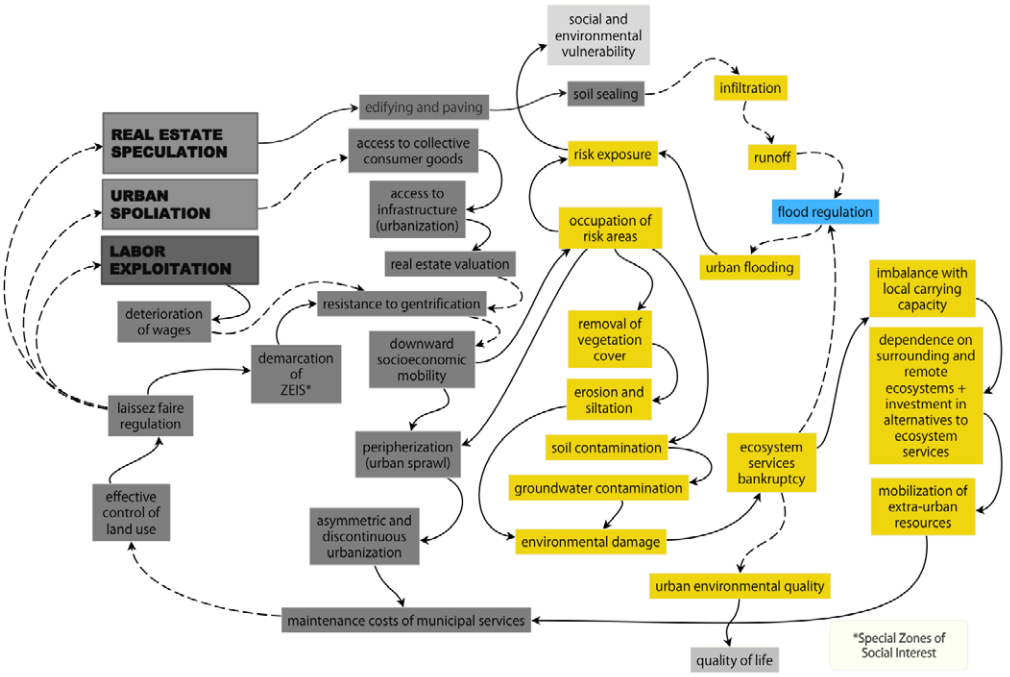

Figure 2. Highlight (in colors) of the traditional framework of floods as isolated natural risks. Font by the authors.

extra-urban ecosystems. Once impaired the internal processes of life support, when not observing the boundaries and the system's carrying capacity, a cascade effect of degradation of urban quality of life starts and the established socioeconomic inequality makes that the losses are also felt unequally.

4. FINAL COMMENTS: IN THE PURSUIT OF URBAN SYSTEMS RESILIENCE

As we have seen, risks are social constructs amenable to mediation at all levels. The first response to any new evidence of threat is almost a reflex arc, rejection or denial. This happens for a simple reason: the absence of a risk is assumed until proven otherwise. It follows in this case, the principle in dubio pro progress, which means: if in doubt, let it be (Beck, 2010: 41).

Threatening situations of strong cognitive dependence, as we have reported here, need to break away from the common sense of a security state and be born scientifically. Systemic threats are still dealing with an indeterminacy of responsibilities scenario due to the high differentiation of the division of labor among a multitude of actors, places and conditions. The causes and the culprits are diluted in a complicity and a general unaccountability, as if there were no choice against a natural destination course. Thus, under the veil of systemic complexity and corporate morality, you can do something and continue to do so without having to answer personally for the consequences of these deeds.

Although the forms of social assimilation of a scientific finding largely escape its methodological conception and operate in a very particular dynamic of outreach and mediation with the public opinion, we admit the relevance of the scientific role in dissipating superficialities and simplistic treatments shadowing complex causalities. Even if there is no guarantee of acceptance by society or by scientific peers about these risk relations assumptions, we understand that without it, societies are condemned to cyclical vicissitudes of cosmetic solutions that have proven to increase problems.

Therefore, we performed some adjustment operations and refinement of causalities concerning the factors that contribute to the production of urban flooding risk in Brazilian generic urban systems. It was made in order to facilitate the effective consideration of unacceptable patterns of living and coexistence in Latin America urban areas – especially to the historically vulnerable groups (Acselrad, 2006). Patterns, as shown here, resulting from implementation and reproduction of the traditional model of use and occupation of urban land.

ACKNOWLEDGEMENTS

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ENDNOTES

1. University of Brasília
2. Translated from: Erros passados, políticas mal concebidas e práticas predatórias resultaram em condições ambientais e sociais que não podem ser facilmente revertidas na ausência de esforços de desenvolvimento substanciais e constantes e que requeiram crescente apoio financeiro nacional e internacional. A decrescente produtividade dos recursos naturais nas Regiões Secas, a prevalência de pobreza e as significantes desigualdades, bem como as fraquezas institucionais, devem piorar com o agravamento da variabilidade e da mudança do clima. (...) Eventos climáticos extremos em diversas partes do mundo – recentes enchentes no Paquistão, incêndios na Rússia e na Indonésia, tempestades de areia na China, comportamento errático das monções na Índia, secas e déficits alimentares na África Sub-Sahariana, secas severas prolongadas e falta de água no norte do México e nordeste do Brasil, entre outros eventos desastrosos em outros lugares – enfatizam a urgência para que os governos se preparem para um clima incerto no futuro. (Declaração de Fortaleza, 2010).
3. Translated from: As origens das catástrofes - cujas causas e consequências convêm elucidar para que melhor se conheçam os riscos incorridos pelo homem – são múltiplas e frequentemente interdependentes. Uma primeira abordagem mostra que as cadeias causais que as produzem se tornam mais complexas com o tempo e com o crescimento econômico, e que o território é diretamente afetado como suporte dos riscos e lugar maior de interações (Vieillard-Baron, 2007).

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Growing small businesses in South African townships: how planning tools can facilitate economic growth

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This paper explores how planning tools can be used to help grow small businesses located in South African townships. It reflects on a pilot project in Langa where additional land use rights were proactively obtained on behalf of 207 property owners to allow for a range of small business land uses. The pilot project highlights the need to consider unintended financial impacts of formalisation on small businesses operating out of residential homes. These impacts include the degree to which additional rights can increase rates charged and the valuation of the property. It is argued that the financial readiness of small businesses to absorb costs and exploit benefits associated with formalisation should inform when formalisation is pursued. The financial readiness of a small business is related to multiple factors and is difficult to determine for both governments and small businesses themselves. Given these uncertainties, this paper supports a process of incremental formalisation whereby governments grant land use rights collectively through mechanisms such as overlay zones. This allows individuals to pursue further formalisation on an individual and voluntary basis; without governments having to pre-empt the readiness of small businesses to submit building plans to activate the land use rights proactively granted.

1. INTRODUCTION

Income inequality and poverty are matters of great concern in South Africa (van der Berg, 2014). The disparity between rich and poor is also manifested in space (McCann et al, 2016). Urban poverty is concentrated in peripherally located townships that were developed as dormitory towns intended for housing a labour force; a lingering legacy of Apartheid spatial planning that divided society along racial lines. Racial segregation is being replaced by class-based segregation and hypersegregation (Geyer et al, 2016). These phenomena are economic in nature and correlated to factors such as the housing ecology rather than race; however the net result is the continuation of Apartheid-era geographies (Geyer et al, 2016).

The Post-Apartheid planning discourse has promoted spatial visions for cities yielding more equitable urban forms; however the spatial integration of South African cities has proven difficult (Harrison et al, 2008; McCann et al, 2016). The livelihoods of those living in townships often rely on informal systems of tenure and employment (McCann et al, 2016). Varying degrees of informality are evident in townships, ranging from completely informal settlements with no formal security of tenure (where informal structures are built without access to formal services) to township areas where some form of formal housing and security of tenure exist, but with an active informal economy.

The role of the informal economy and Small Medium and Micro Enterprises (SMMEs) specifically has been recognised in the South African policy environment (COCT, 2012). South Africa suffers from high unemployment and the National Development Plan's aspiration to create 11 million additional jobs by 2030 will be partially reliant on the creation of new - and the upscaling of existing small businesses (Fatoki, 2014; Republic of South Africa, 2012).

Micro and small businesses are classified according to inter alia, annual turnover, total gross asset value and period of existence. Micro enterprises (defined as employing less than five people) are the most pervasive entrepreneurial activity in South Africa and are expected to be an important vehicle to address challenges around job creation, sustainable economic growth and equitable distribution of income (Fatoki, 2014). Many policy makers in South Africa continue to conflate poverty and income inequality and whilst more jobs will reduce poverty, it will not solve income inequality (van der Berg, 2014). Whether micro enterprises will be the panacea for

all South Africa's economic development challenges remains to be seen; however supporting small and micro enterprises in township locations is argued to be both justifiable and logical from a policy agenda seeking to create more spatially just cities. In this context, this paper aims to explore how the urban planning profession can contribute to creating preconditions for the growth and development of small and micro enterprises operating informally in township locations. It does so by reflecting on a case study in Langa, Cape Town.

2. PROBLEM STATEMENT

SMMEs have a high failure rate in South Africa (Fatoki, 2014) and operate in uncertain environments. Ligthelm (2010) reflects on various studies and concludes that whilst governments and NGOs wish to intervene by assisting informal businesses to graduate into the formal realm, policies are ineffective when the objective of the entrepreneur is not growth but survival. Ligthelm's own research undertaken in a South African township find that entrepreneurial endowment and motivation of the individual entrepreneur largely dictates the survival and growth potential of the business. Despite this, the degree to which the wider regulatory environment is supportive of start-ups or informal enterprises seeking to formalise is considered important.

As part of this wider environment, municipal regulation plays a role that may either exacerbate or improve existing conditions that result from factors beyond the control of SMMEs (DPRU, 2006). Within this realm, non-financial municipal regulation such as zoning and business licensing has been identified as one of the areas likely to impact on start-ups or informal enterprises seeking to formalise. Appropriate zoning is in many cases a pre-condition to other approvals (such as a business license). The impacts of addressing land use regulatory matters are particularly important at the pre-establishment or start up phases of businesses when resources are often severely constrained (DPRU, 2006). Whilst many enterprises will continue to operate informally in township areas without being closed down due to non-compliance, it is argued that obtaining appropriate land use rights are important to the businesses seeking to grow and formalise.

One of the planning legacies in South African cities has been poor local preconditions for business development. In some cases, issues are rooted in problematic spatial structure characterised by internalised neighbourhoods and poorly located and performing business centers, which cannot take advantage of passing trade. Townships often reflect zoning that mirrors their historic planned "dormitory" role. Despite residential properties being permitted certain micro-enterprise uses, these rights are not extensive. Many township areas reflect active and vibrant informal economies with a range of businesses operating in apparent contraction to what might be expected from viewing zoning maps of these areas. In this context, is there a role for planning to play?

The practice of urban planning in a developmental context is often partial on a territorial level and tends to abandon areas that are poorly regulated by law (Bolay, 2015). Watson et al (2013) identified informality as a contributing factor to the contrast between planners' official intentions and the reality on the ground. Consideration of the informal sector, and particularly the trading and employment generation aspect thereof, has yet to be incorporated into mainstream planning in South Africa (Du Plessis, 2014). Where the informal sector is mentioned in spatial development frameworks (SDFs) aimed as guiding land use decision making, is not clear in how these statements might be translated into action. For instance, the Cape Town SDF offers vague statements of support for informality and SMMEs (CCT, 2012). Whilst local spatial plans might indicates progressive land uses in predominantly residentially zoned townships; such spatial plans do not confer land use rights and is therefore unable to meaningfully address regulatory barriers facing SMME operators in townships. Property owners are still required to submit individual land use applications to change their land use rights to obtain business licenses.

The impetus for business owners to obtain land use rights does not necessarily work in favour of enabling the progression and growth of these businesses. Firstly, there are costs associated with doing so and along with the time necessary to deal with the issue, the business owner may be inclined to continue to operate informally in terms of the planning regulatory environment. Secondly, land use processes may present a complex and challenging (and seemingly unnecessary) concept for business owners to deal with. Coupled with the fact that enforcement of land use regulation is generally complaints driven and that this has traditionally been less prevalent in poorer areas of cities, operators will either choose not to regularise or remain ignorant of their "illegal" status from a land use perspective.

3. CASE STUDY: LANGA

With a growing focus on the potential of appropriate zoning as a possible lever to create an enabling environment for the growth of informal enterprises, the City of Cape Town (hereafter referred to as the City) decided to consider a direct intervention around individual land use rights in a township area where business uses were likely to be desirable. The potential was recognised to consider "regularising" desirable existing informal businesses that may be in operation.

Langa Township was chosen as a pilot site. A land use survey confirmed that there were a number of existing shebeens (a South African term for taverns), restaurants and guest houses operating in an area consisting of 207 properties called the Langa Quarter. The Langa Quarter also happened to be the lead project of iKhaya le Langa; a non-profit organisation whose aims are to address particular social needs in a community through providing socially enterprising solutions. Their vision for the Langa Quarter was to transform the area into a vibrant 'responsible' tourist destination. Whilst this vision had community buy-in; many of the existing illegal businesses could not be legalised due to their residential zoning and did not have the funds to undertake individual land use applications.

3.1 Intent

The objectives of the pilot project in Langa was to test a new planning approach by initiating a process to proactively obtain land use rights on behalf of property owners in an area where the likelihood and potential for individual owners to do so was low, but where the opportunity for business growth was high. These rights were the first step in regularising existing illegal businesses and in creating a platform for starting new legal businesses. In this context, a range of consent uses was applied for on behalf of property owners to permit restaurants, offices, boarding houses (guest houses) and service trade. It was also recognised that some businesses might need to physically expand in future or had already expanded and could benefit from an increase in the permissible floor factor from 1 to 1.5.

3.2 Challenges and process design

Several challenges emerged as part of this project. Firstly there was a concern that changing the land use rights of a property may have financial implications for property owners- both in terms of the rates they are charged and the valuation of their property (and by implication, the potential resale value of their property). In response, the City undertook investigation into this aspect with a view to understanding under what conditions these impacts would be felt and to what extent they could either be avoided or delayed.

Secondly and on a more practical level, one of the requirements of this land use application was the need for power of attorneys from the property owners to act on their behalf. This highlighted an issue around ownership that afflicts many township areas and led to challenges in terms of tracking down the legal owner of the properties. Title deeds in townships often do not reflect the correct property owner. Many residents in townships received government-sponsored houses that legally cannot be sold for the first 7 years. Informal transfers are common, resulting in a category of property owners that do not have formal title. Even in cases where government-sponsored houses have not been sold on, complications arise where multiple family members inherit a property. Title deeds therefore do not keep up with property transactions and many current property owners do not have title deeds reflecting their ownership.

It was recognized that it would be unlikely to obtain the 207 power of attorneys due to title deeds not being up to date and that the process was potentially one that required greater shared understanding. The City, with the help of iKhaya le Langa, organized preconsultation sessions with the property owners of the Langa Quarter. These sessions aimed to explain what the City intended to do (which was to give legal effect to the vision of iKhaya le Langa) and to confirm whether the City had a mandate from the community to submit an application on their behalf.

Additional public engagement sessions with the community were held to introduce abstract planning concepts and jargon related to land use rights. This was to ensure that participants could engage with the formal correspondence they would receive from the City as part of the legal participation process of the land use application. The official formal correspondence was supplemented with "information packs" in a question and answer format, based on questions raised during the public meetings. Property owners in the Langa Quarter were presented with three options. The default option was that property owners who took no action would be included in the land use application for additional rights (which would not result in financial impacts). They could then submit building plans at a later stage to give effect to their newly obtained rights but would be under no obligation to do so.

Property owners who had existing businesses and

Status	Land use rights for the Langa Quarter : Pre-approval	Land use rights for the Langa Quarter: Post approval
Zoning	Single Residential 2	Single Residential 2
Uses	Dwelling House Second Dwelling Utility Service Urban Agriculture Shelter House Shop Home Occupation Bed and Breakfast Home Child Care Informal Trading Any educational, religious, occupational or business purposes; with dominant residential use.	All uses permitted in SR2 plus the following consent uses: **Restaurant** **Office** **Boarding House (Guest House)** **Service Trade**
Floor factor (FF)	1	1.5 for property owners who requested additional FF and signed the letter of consent.

Table 1: Comparison of land use rights before and after the pilot project was completed

who wanted both land use rights and an increase in floor factor (to extend their built structure beyond what was allowed in the single residential zoning) had to sign a letter of consent to acknowledge that their new rights might result in financial implication, regardless of whether they use the rights or not. Property owners who decided that they did not want any rights could write to the City to request to be excluded.

The process had to cater for different levels of participation as well as for different land use demands. Whilst the business identified in the land use survey might have been an indication of demand for a specific land use, it remained impossible to forecast the market saturation point and what the degree of take up of such land uses would be. Given uncertainties around demand, a "basket of rights" approach was followed, which included applying for five different land uses namely guest house, restaurant, office, boarding house and service trade.

The degree of uncertainty in terms of the take up of rights included in the basket of rights was problematic for the City departments who had to comment on the impact of the application from a services capacity perspective. A pre-submission meeting was held with potential commenting departments, who were given a matrix indicating different scenarios in terms of the take up of rights. It was requested that the comment should relate to the "highest impact scenario" from their departmental perspective.

3.3 Outcome

The application was submitted in March 2014 and was approved one year later. During the public participation process, no requests for exclusion were received from the community. This outcome was greatly assisted by the partnership with iKhaya le Langa, who had a long-standing working relationship with the community and was able to provide social and physical infrastructure for the resource-intensive public participation and education sessions that were held.

3.4 Further roll out and Small Micro Enterprise Overlay Zone

Cape Town's new Planning Bylaw makes provision for overlay zones that can allocate rights to pre-determined spatial locations. It was proposed to introduce a Small Micro Enterprise overlay zone based on the basket of rights used in the Langa pilot project. The Small Micro Enterprise (SME) Overlay zone was approved in June 2016 and can be applied along activity routes as identified in spatial plans. The overlay zone therefore gives effect to ideas articulated in local spatial development frameworks (supporting economic development along certain roads) and in policy (supporting SMMEs). The SME overlay represents an example of how different planning tools (policy, SDFs and zoning schemes) can work together to bring about spatial change.

4. FINDINGS RELATED TO THE FORMALISATION OF SMALL AND MICRO ENTERPRISES

4.1 Formalisation could have negative and positive financial impacts on the individual

The Langa project highlighted the need to consider unintended financial impacts of formalisation. In Cape Town, an Indigent grant ensures that property owners do not pay rates and taxes for the first R200 000 value of their property. This means that properties with a valuation below R200 000 do not pay any rates. The properties in Langa were valued at just below R200 000 and a slight increase in valuation (as a result of additional rights) could result in residents needing to pay rates. Many of these increases would be considered miniscule for the average land use applicant, but may have detrimental impacts on survivalist business's cash flow. More importantly, whereas an increase in one's property valuation would generally be assumed as something positive, this is not always the case in a context where property owners have no intention of selling their property and where low property values allow property owners to qualify for the Indigent grant.

Formalisation could also have positive impacts in terms of access to credit. Having the correct land use rights is a pre-requisite for applying for business licenses, which in turn is a prerequisite for many business loans from commercial banks. Non-compliance with legislation and having something that occurs "illegally" therefore excludes business operators from accessing formal sources of finance. Further investigation into the financial impacts of this type of intervention is likely to be a useful area of enquiry.

4.2 Security of land use should be pursued incrementally

Security of land use refers to having a degree of comfort that a certain type of land use will be supported in a specific location. In the context of Langa, it refers specifically to business owners knowing that land use rights allowing their operation are supported in their current location. Whilst security of tenure impacts on the investment patterns of individuals (who are more likely to invest in properties if they do not fear eviction), it is not clear whether security of land use provides an incentive for individuals to invest in the properties out of which they operate their businesses (in most cases, their residential home). However, if there was a disincentive to invest in illegal businesses out of fear of closure, security of land use will (at the very least) neutralize such a disincentive.

There are many parallels between security of tenure and security of land use rights in terms of actual and perceived benefits of formalisation. In the case of title, De Soto's hypothesis is that formalisation is necessary to achieve economic growth in developing countries and to access credit (Geyer et al, 2014). Critics argue that there is a lack of economic progress amongst those who have formalized and that formalisation does not necessarily guarantee access to credit (Geyer et al, 2014).

It is too soon to determine whether the security of land use rights in Langa has achieved economic growth or resulted in access to credit. Whilst the value of abstract and intangible assets such as land use rights to the individual in a township context is still uncertain, there is anecdotal evidence that the broader Langa Quarter received more corporate social investment (CSI) as a result of the pilot project. This does not directly benefit individuals; however it could result in indirect benefits for businesses operating in the Langa Quarter. Ensuring that businesses can comply legally by proactive changing land use rights (and therefor, providing security of land use) significantly lower the way corporations assess the risk of potential beneficiaries of CSI.

Geyer et al (2014) suggests an incremental approach to the formalisation of property titling whereby security of tenure is first achieved collectively before the individualization of ownership. This incremental approach can also be applied to the formalisation of land use rights, whereby security of land use is first pursued collectively. Both the Langa pilot project and overlay zones pursue collective land use rights. These initiatives give assurance to all small businesses, illegal and legal, that their land use is in principle supported in their current location and that if they operate within reasonable parameters, they will not be served with a closure notice. This allows the government to proactively clear the first regulatory hurdle facing small businesses without having to pre-empt which businesses are survivalist and which have potential to grow and be formalised further by virtue of submitting building plans.

4.3 Formalisation should happen at the discretion of the owner and in conjunction with financial education

An important question arising from the Langa case study is how one determines when a small business is ready to absorb costs and access the benefits related to formalisation. Fatoki (2014) interviewed 33 micro enterprise operators and found that most owners do not engage in formal financial planning and only keep some books of accounts. Whilst this

study had a relatively small sample size, it indicates low levels of financial literacy amongst owners of new micro enterprises. This suggests that even if the government could accurately calculate the exact increase in cost as a result of formalising (such as the increase in rates caused by additional land use rights, once an owner submits a building plan), not many owners would be able to assess their financial situation and determine whether they are financially ready. Fatoki (2014) also found that whilst respondents understand commercial banks as a source of finance, they did not understand the sources of equity finance and the requirements to obtain a loan.

Any conversation around formalisation of small businesses and the associated land use rights requirement needs to highlight the benefits of access to formal financing and promote the aspiration towards greater citizenry (paying rates and moving your property out of the Indigent valuation threshold). This presents a balanced and realistic narrative of formalisation- the owner will be responsibilities for more costs, but will have access to more opportunities to grow.

According to Ligthelm (2010), the likelihood of successful formalisation is largely based on the human factor such as the individual business owner's positively motivated business intentions and actions. This was also evident in the Langa pilot, which included businesses that were survivalist in nature as well as businesses that had won awards and had navigated complex bureaucratic processes without assistance in the same precinct. It would therefore be futile for governments to attempt to pre-empt when businesses are ready to formalise and the focus of government intervention should be limited to creating preconditions for voluntary formalisation. Governments can play a role in proactively clearing the initial regulatory hurdle on behalf of businesses and empowering owners to make an informed choice about when they are ready to undertake further formalisation (by means of submitting a building plan) based on individual circumstances.

4.4 Acceptance of informality should not be the only policy response to informal businesses

Acceptance of informality ensures that vulnerable survivalist businesses are not burdened with administrative processes and financial costs that can result in their undoing; however merely accepting informality is not helpful to other informal businesses. The absence of any attempt to create the preconditions for formalisation of informal businesses guarantees limited growth by virtue of exclusion from formal sources of finance. In this context, what is envisioned is not a process of forced formalisation (whereby operators are threatened with being closed if they do not formalise) but creating opportunities for voluntary formalisation. Whereas Cape Town's planning policies and plans currently offer statements of support for SMMEs, this position can now be supplemented by outlining support for growing SMMEs through a process of incremental and voluntary formalisation linked to the implementation of SME overlay zones in suitable township areas.

Amin (2013) cautions against viewing poor areas exclusively through a "human potential" optic-devoid of audit by numbers and distracted by place-based biographies and ethnographies. Whilst this paper reflects on a place-based narrative around experiences in Langa, the true measure of success will be whether the basket of rights applied for in Langa can be replicated elsewhere in Cape Town by making use of the SME overlay zone. It is hoped that this paper illustrates the need to attempt to quantify the impacts of intervening in the informal economy. The Langa pilot project dealt with uncertainties relating to land use demands, land use take-up and financial readiness of businesses by allocating uncertainties to different scenarios and attempting to quantify likely scenarios. Despite the fact that quantification of such scenarios provides limited guidance (such as having no financial impact, having a potential financial impact or having a significant financial impact on the property owner), it can alert those who intervene in the informal economy of potential unintended financial impacts.

5. CONCLUSION

This paper investigates the role that the profession of planning can play to help clear regulatory hurdles encountered by small and micro businesses operating in townships in South Africa. A pilot project in Langa is presented as an example of how the government can proactively apply for additional land use rights on behalf of property owners. The pilot project highlights the need to consider financial impacts of formalisation- both positive and negative. Given these financial impacts and the different financial situation businesses find themselves in, it is proposed that formalisation should be pursued in an incremental manner. Suggestions include pursuing security of land use collectively- either via a project (such as the 207 property owners in the Langa Quarter) or via the new SME overlay zone (that applies to sections of certain streets

identified in local policy documents). This allows property owners in these areas to pursue further formalisation by means of submitting a building plan as and when they are financially ready. This two-step process accommodates uncertainty around the financial readiness of businesses to formalise and uncertainty around the likely demand and take-up of specific land use rights in local areas.

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The future of urban living - new forms of work, planning for the unknown in Amsterdam

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While economic growth has not (yet) regained its pre-crisis size and austerity measures are strong and stringent, housing markets in consumption cities such as Amsterdam are booming again. The need to build large numbers of homes is great and hard to resist. Amsterdam is popular and grows with an average of 11.000 inhabitants each year. The council would like to relieve the pressure on the housing market and thus guides and enables the construction of 50.000 houses within the city borders up until 2025. However, the focus on housing quantities and quick hand-over of the new housing stock needs to be complemented with other activities, aims, and values. High-density housing is not the only thing we need in the cities of the future. Besides a home, what kind of urban living will the citizens of the future be looking for? And how will the evolution of work influence the contemporary city and its metropolitan region? The Future of Urban Living is a research-by-design project with a focus on Amsterdam's Metropolitan Region. Currently in the preparatory phase, the article will give an insight into the issues that are currently being considered by the project team of the Spontaneous City International. Furthermore, this paper will elaborate on the principles underlying the research and the methodology to be used, providing an introduction to the use of scenario's in spatial planning, with references to publications of leading institutes on the subject.

1. INTRODUCTION: RESEARCHING 'THE FUTURE OF URBAN LIVING'

Do we know how we will live in the city in the future? Is there insight into the changing relationship between dwelling - working - and spare time? And what does this potential transition mean for the organization of areas, investment in buildings and the nature of the planning process? In urban planning, there are signs of awareness we should not be building houses and develop urban areas that only address short-term needs and promptly become obsolete and dysfunctional. A focus on housing, quantity and speed is insufficient. Urban areas need to be sustainable, resilient and attractive, creating value for the city in the long term. Urban life is continually subject to change and develops at an increasing pace, as a result of technological innovation, social developments and insights, as well as through all sorts of coincidences. This applies to both major cities in the Netherlands as well as centres in other European countries and beyond. The great themes of today, such as migration, climate change, changing perceptions of economy, digital technology and robotics have had and will continue to have a profound effect on daily life, politics, and urban planning. Professor Klaus Schwab, founder and executive chairman of the World Economic Forum, announce the dawn of a new (technological) Fourth Industrial Revolution (Schwab, K., 2016) - the first three being the transport and mechanical production revolution of the late 18th century; the mass production revolution of the late 19th century; and the computer revolution of the 1960s. Dutch Professor Jan Rotmans (Erasmus University in Rotterdam the Netherlands, focusing on sustainable transitions and system innovations) states on his website 'We do not live in an era of change, but a change of era', a view he elaborates on in the book 'Change of era - Netherlands tilts' (Rotman, J., 2014).

'The future of urban living' is a research-by-design project, which is currently in the preparatory phase. While writing this article in June 2016, a scoping document has already been distributed. This document is a short, well-designed note which gives an overview of the first ideas about the project. It proposes the themes and goals of the study, the use of scenarios and research methods. The scoping document is used as a starting point to initiate an open dialogue with stakeholders: Preliminary discussions on collaborations between different governmental and research partners have

been held, including the municipality of Amsterdam, The Netherlands Environmental Assessment Agency, the Amsterdam School of Real Estate, the RUAF foundation and the research initiator: The Spontaneous City International. This article is based on the scoping document prepared by the research team. In the context of this research, what we define as 'urban living' goes beyond dwelling and providing housing. It includes all forms of activity, ranging from work to leisure, and hence education, health, and everything else that contributes to creating a society in a city and its region. The aim of this study is to gain a better understanding of the spatial principles, frameworks and development strategies which in the future will contribute to shaping the living environment in the city. The focus will be on the way we will work in the future, with work as a basic human activity, raising questions such as;

- What does this mean for the daily life of the users in their city? Does the daily rhythm change, how will people spend their time in the future, and what impact does this have on mobility and other spatial patterns?
- What are the implications for the organization of space and use, in buildings, areas, cities and regions?
- What does this mean for investing parties and the role of the government?
- What are potential consequences for planning strategies and tools? What type and degree of management will planning processes require? What is uncontrolled, what should be facilitated, what should be monitored? What effect will this have on the process that underlies spatial planning?

To gain insight into this subject, 'research by design' is used, exploring how the transformation of (mono-functional) business parks and areas of work into attractive living environments can be accomplished, with flexible mixed-use development which can absorb the transition to new work. Subsequently the outcomes are applied to test cases in the Amsterdam Metropolitan Area.

2. DEVELOPMENT IN THE AMSTERDAM METROPOLITAN AREA – VISION FOR 2025

In the Metropolitan Area of Amsterdam, a huge acceleration is set in motion, expressed in the ambition to build approximately 50,000 new homes within the city limits until 2025 (Gemeente Amsterdam, 2016). One important keyword is flexibility, i.e. the degree to which the development strategy provides for change and accommodates adaptability. The other keyword is high quality of life, where high density dwelling is combined with developments such as new forms of work, changes in care, the pursuit of circular processes etc. The strategy is created to ensure that development leads to attractive and sustainable urban areas, that complement the characteristics of their specific environments. After consultation with the City of Amsterdam, in response to the policy document, it was stated that they recognize the issues outlined by the research team in the proposal 'the future of urban living', and are mainly interested in the transformation of mono-functional areas to mixed urban environments. The focus is currently on high density combined with a high pace. But how do you deal with the dilemma of large numbers on the one hand and the many uncertainties on the other?

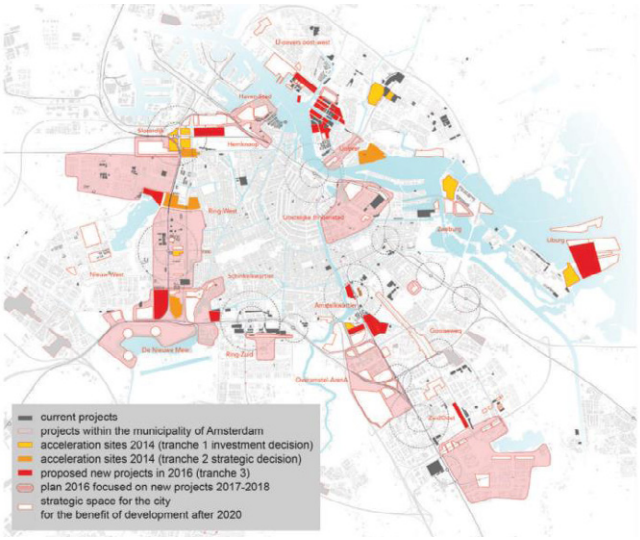

Figure 1. Map 'Space for the city' showing potential housing locations in and around Amsterdam. Source: Gemeente Amsterdam (2016) Koers 2025 Ruimte voor de stad [online] Available at: https://www.amsterdam.nl/gemeente/volg-beleid/koers-2025-amsterdam/ [Accessed 17 06 2016]. Page 57.

3. CENTRAL QUESTION

How can existing (mono-functional) areas and business parks be transformed into flexible and attractive mixed urban areas, which can absorb the transition to new work? In other words: At present, which urban/morphological/functional principles, and what institutional preconditions/ frameworks and strategies can be used, to in the future create an interesting mixed urban environment?

4. METHODOLOGY

The methodology for the research 'the Future of Urban Living' includes the elements represented in the scheme below.

4.1 Analysis lines

The format for the process encompasses the following research techniques:

1) Literature review: Sources such as primary publications including journal articles, dissertations and reports, websites and grey literature.

2) International references: The extensive network of the research team will provide the basis for a pool of experts in the field of spatial development, which may suggest different trends, concepts and projects in their local area. The purpose of this part of the research is the collection and comparison of recent best practices in cities experiencing similar pressures

3) Interviews: Individual in-depth interviews with experts (both public and private parties as well as knowledge institutes)

During the initial phase of this study, a preliminary meeting was already held with a variety of experts in different fields, ranging from architecture, the transformation of existing buildings and areas, and city and place making, to urban agriculture. The municipality and province were also part of this meeting.

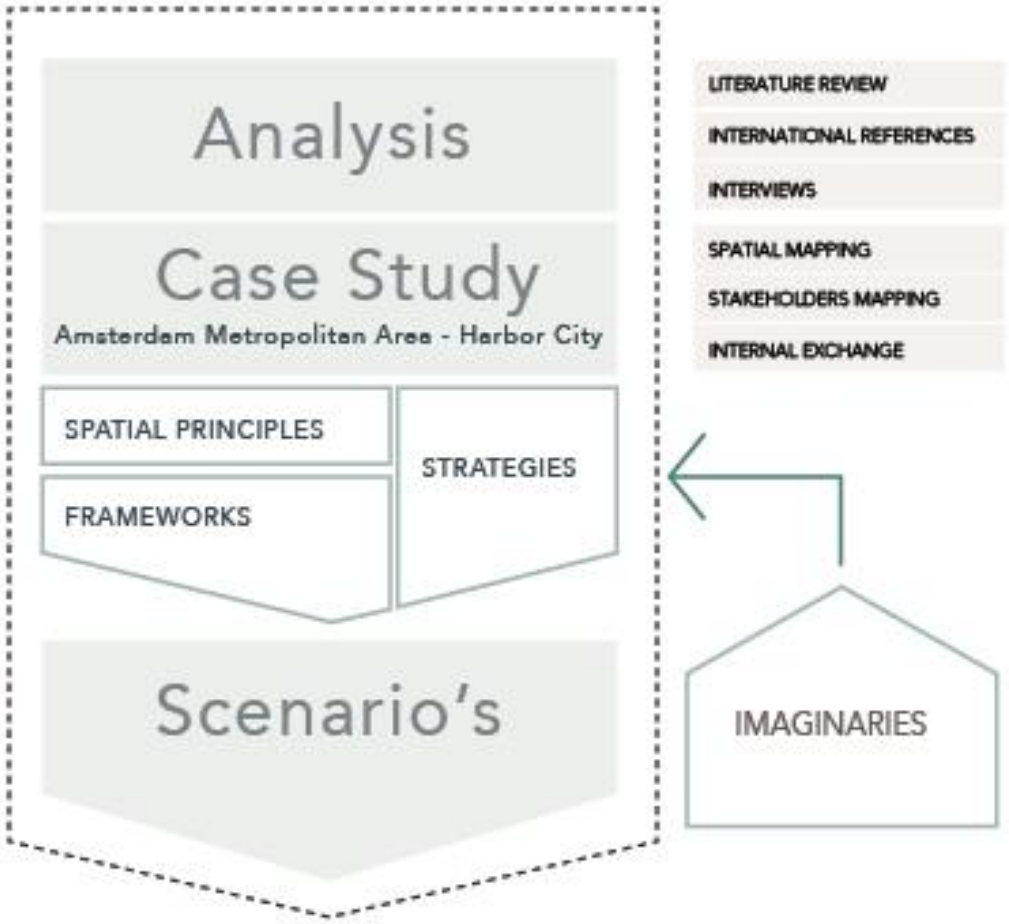

Figure 2: Scheme representing the research methodology. Source: the Spontaneous City International (2016) Concept voorstel 'the Future of urban living'. Unpublished.

5. STAKEHOLDER MAPPING: COLLECTIVE FORMULATION OF AMBITIONS AND OBSTACLES

It is important that all stakeholders in an area actively participate, by formulating ambitions and obstacles, to be able to understand what their specific goals and dilemmas are. Recent years have shown that the municipality, and other authorities such as the province, do not have the only say when it comes to a vision for the development of the city. Instead of slipping back into pre-crisis business-as-usual practises, we should harvest the innovations that were generated during the economic crisis: Current and future residents, entrepreneurs and investors have conquered their place on the stage. Ambitions are the main objectives, collectively formulated by all stakeholders involved in the transformation of the area. This may include one or several main ambitions, and their content should indicate the scope and direction for the longer term. Obstacle are the blockages that impede the realization of the ambitions, such an outdated planning tools, too much control by government, the quality of accessibility, environmental pollution etc. These stakeholders also have specific interests in the transition and development of the city and its metropolitan region and face specific dilemmas:

- Developers and investors: In terms of real estate, in what type of qualities should be invested to create a sustainable long-term investment? The Urban Land Institute (ULI) in the Netherlands carefully keeps track of the emerging trends in high density developments, urban living and attractive environments and what these means for investment.

- Housing Corporations: The current focus is on the core stock and high density. What is needed, to ensure that the property development becomes part of building an attractive urban area?

- New types of investors: Many new investors are emerging, all eager to join; ranging from individual clients, and small groups of clients to various forms of cooperatives and collectives of clients (in the Netherlands known as CPO's, collective private developments). They want space to develop their own initiative. A great current example is Living LAB Buiksloterham in Amsterdam North (Circulair Buiksloterham, 2016), who is experimenting with circular principles.

- Citizens: What is needed to make a city in which an entrepreneurial spirit can be combined with urban citizenship? In this year's Internationale Architecture Biennale in Rotterdam, new forms of civic economy are being explored (IABR, 2016).

6. SPATIAL MAPPING: CASE IN AMSTERDAM METROPOLITAN AREA

An area in Amsterdam has been selected to serve as a tangible local case study. The City of Amsterdam has proposed an area West of the city centre, called 'Port-City area', reaching from the area surrounding the train station Amsterdam-Sloterdijk to the waterfront at the 'Houthavens'. The area is large: it covers a similar amount of space as the historical city centre of Amsterdam, and to walk from east to west will take about 45 minutes, covering 3,5 kilometres.

The municipality proposes this zone, as it has been reviewed as 1 of the four areas within the city exploring the spatial possibilities for area development, as part of the strategy 'Koers 2025'.

Currently the area has the following characteristics:

- Functioning, growing port, near the city centre

- Relatively mono-functional work area, comprising several sub-functions: station area, business park, urban work area, port and industrial area.

- Key sectors: manufacturing, trade and transport

- The area is fragmented by major infrastructure: highway, rail, large green spaces

- Crucial to the transformation into an attractive, mixed urban area is the reduction of environmental nuisance and overcoming barriers.

- Relatively unknown to current residents of Amsterdam

- Variety of spatial characteristics related to: building typologies (height, volume and footprint of buildings); size of plots, density and mix; availability of amenities, facilities and public/green space, etc.

In 'Koers 2025' the analysis of housing stock shows that currently, 700 units are being built in the Port-

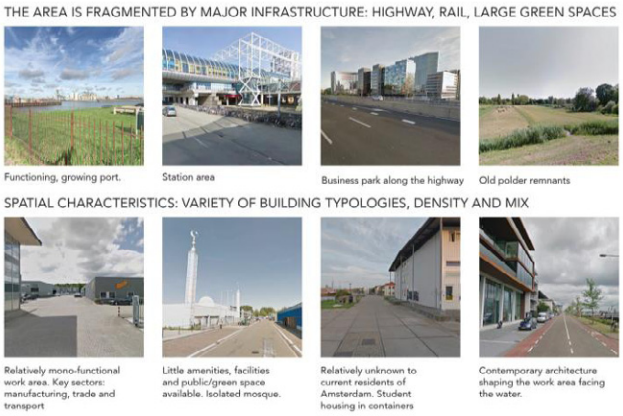

Figure 3: Aerial photograph of a part of the Port-City Area, looking North-West. In the center the train station surrounded by offices, with in the back Westpoort harbour area. Source: General aerial photography (2014) Luchtfoto Amsterdam-Sloterdijk [image] Available at http://www.nieuwwest express.nl/nl/page/4579/luchtfoto-amsterdam-sloterdijk [Accessed 17 06 2016]

Figure 4: Matrix showing spatial typologies in the Port-City Area. Source individual images: Google Streetview (2014) Amsterdam [online] Available at: www.google.com [Accessed 17 06 2016]

City area, with a possible acceleration to an additional 3600 units, which could help the city of Amsterdam to reach the target of adding 45.000 units to the housing stock before 2025. This means the area will be providing nearly 10% till 2025, with the potential to accommodate an additional 6700 units (Gemeente Amsterdam, 2016, p.44). The policy document states that 'Central task in the Port-City area is the gradual transformation of a mono-functional work area around the Sloterdijk node to a mixed urban living - working environment taking into consideration the incumbent business' (Gemeente Amsterdam, 2016, p.41). A gradual transformation entails a step-by-step approach: 'Looking at the size, diversity and quality of the Port-City area a fixed scenario has not been chosen, (..) rather a gradual transformation process has been decided upon'. The final decision on the development of the area will be taken in 2025. However, the municipality recognizes that there is currently need for action: "To initiate the gradual transformation, to ensure quality and to gain public support, it is necessary to take a number of first steps in the coming years in both planning as well as execution' (City of Amsterdam, 2013 p.7). The research 'The future of urban living - New forms of work, planning for the unknown' will contribute to this.

7. WHAT-IF..? SCENARIO'S

What will be the impact of technological change, social trends, and major issues such as migration, climate change, and a new industrial revolution? It is obvious that we cannot know what the future will bring. At this moment we only have (weak) 'signals' of what the future might hold. Scenario's, instead of more common, short-term trend analysis and forecast of the latest developments, can help us to think and anticipate the unknown. They can be employed as a tool to explore this possible impact, and used by policy makers to better deal with complexity and uncertainty in decision making, improving strategic policymaking and its outcomes (Dammers et al. 2013). Scenarios are characterised as follows (Dammers, 2013):

- Stories about the future
- Regarding a strategic policy-issue
- For the long-term: 10 to 40 years
- In words, images and numbers
- In plural: alternative directions
- Combining imagination with realism

Although some researchers claim that there are scarce examples of the application of scenario planning techniques in the field of urban planning (Stojanovic, M, ea. 2013), it is a frequently used a well documented (albeit in Dutch) method in the Netherlands, on different governmental levels. A large player in this field is the Netherlands Environmental Assessment Agency (PBL - Planbureau for the Leefomgeving). They have eloquently described the use of the scenario method in 'Making scenarios for environment, nature and space: a guideline' (Dammers, E., ea. 2013). An international publication in English is created by the European Environment Agency (EEA, Alcamo, J., 2001). However, there is not one correct way to use

scenarios 'the way in which scenarios are created, is dependent on the goals the scenarios serve, the types of scenarios that are made, the resources that are available, etcetera. There is no single best way to do it' (Dammers, E., ea. 2013, p.8).

7.1 About scenarios, and the use of qualitative, exploratory, normative scenarios in this study

Scenarios make statements, based on knowledge and information about the past, about the different directions in which a combination of developments could occur in the future. This may be a future which is deemed possible, but could also consider futures that are desirable, or a combination of both. In addition, scenarios could focus on social and physical developments that occur more or less autonomous, but also on policy developments that are largely controlled by policymakers themselves. For the purpose of this study, the emphasis is more on expectations, wishes and creative ideas; It will consider possible or desirable futures and autonomous or policy developments. Two types of scenarios can be distinguished: qualitative and quantitative (EEA, 2001). In this study, qualitative scenarios will be used. The future will be depicted or described in the form of words and visual symbols: mainly narrative texts (story lines), representations of the future (maps, artist impressions, photomontages) or a combination of the two. Then the degree of exploration: ranging from dominant scenarios, via restricted exploratory scenarios, to highly exploratory scenarios. This study will be using highly exploratory scenarios: current developments will be taken to the extreme, new developments will be detected and developed, and radically different directions in which developments can proceed will be explored. This approach will clarify the limits of developments, and encourage out-of-the-box thinking, as well as expand the understanding of emerging issues and policy alternatives, facilitate open discussion about the future and contribute to vision development. Finally, descriptive and normative scenarios can be distinguished. We will be looking at normative scenarios, that are focused on exploring normative uncertainty, for example several policy goals that could be pursued, as well as changing values and norms in society.

7.2 Extreme 'What-if?-scenario's: starting point for the scenario's in this research

Uncertainties about the future on a national level are central in a study called the 'horizon scan' published by PBL in 2013. In this research, PBL acknowledges that in scenario studies uncertainties often 'lose out'. 'But some of these uncertainties occur later as the dominant uncertainty in new scenario studies' (p.61). Therefore, PBL has included four 'what-if' scenarios in their publication that, to date, have not yet been published. These are trend breaches or discontinuities in developments of which it is conceivable that they happen. However, these 'What-if's' are more surprising and extreme than the uncertainties on which consensus has more or less been established. The research team is interested in these scenarios, as we consider those requirements that could develop in the long term, but at this moment are still considered to be unlikely, of particular relevance for this research. The four extreme scenarios presented are (PBL, 2013, p.61):

1) What if our life expectancy increases to 120 years in 2050?

2) What if efficient cities are controlled by big data?

3) What if a breakthrough in the storage of electricity is achieved?

4) What if weather and climate extremes greatly increase over the next 20 years?

7.3 Investigating future changes in work in the form of scenario's

During the preparatory phase of the study, we will be looking at the potential and relevance of extreme scenarios that focus on the question 'What if, in

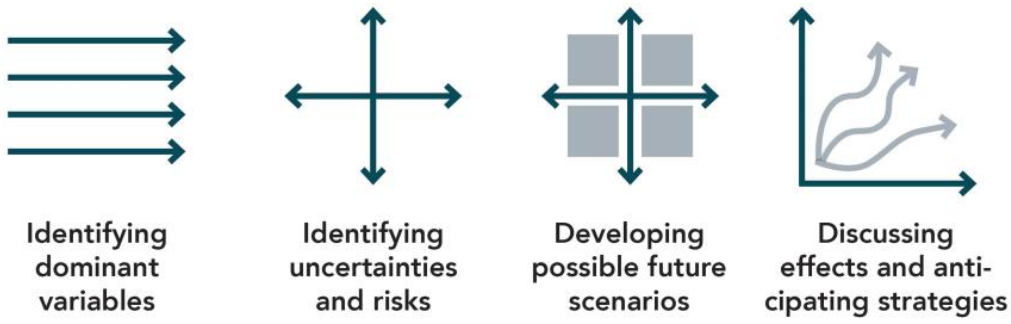

Figure 5: The municipality of Amsterdam works with 4 steps when using scenario planning. Source: City of Amsterdam (2016) Developing Zaatari. City of Amsterdam and VNG International. Page 26.

a few decades, we are no longer able or willing to work in the traditional way?' In their research PBL suggests that technological innovations will significantly change the world, but 'how is difficult to predict over such a long period. In the field of digital media, biotechnology, nanotechnology and robotics anticipated innovations seem to be most radical' (PBL, 2013, p.23-24). The research team wonders:

- What if robotics replaces many more jobs in certain parts of the labour market? What will be the impact of robotics and the automation of for example, office work? What impact does this have on the size and location of businesses?
- What if the labour market becomes even more flexible? What impact does this have on the workplace and the use of space per worker? Will this lead to (further) office vacancy?
- When new media further enters the work environment, will the workplace change accordingly?
- What if workplace activities are (even) less tied to location, timing and duration? Organizations with a network character may operate in a way that is less bound to a single location. That can transform living and commuter behaviour; more freedom in the choice of location of residence, and changing commuting patterns (the end of congestion?). What will be decisive in the choice of a dwelling; attractiveness of the living environment, the quality of the facilities, or ..?
- What if the lines between leisure and work, work and home, public and private, blur even further?

Let us assume that these changes in our daily lives and our activities, become reality - what would that mean for the design of our cities? These types of relatively extreme 'What-if' scenarios serve to stretch the mind: It does not mean we must literally 'plan' for such activities, but we must ensure that such developments are not made impossible when they actually occur, by the way we plan our cities. Urban areas should be developed in such a way that they are sufficiently flexible and accommodate the unknown.

7.4 Methods to develop scenarios

As a first step, the research team will prepare outline scenario's. These will serve as a starting point for roundtable discussions, testing the limits. During these discussions, the experts will reflect together on the presented scenario's. Potentially, use can be made of infographics to depict the scenarios and stimulate the discussion. Then, the direction and number of scenarios will be established, after which they will be elaborated in three ways:

1) Storylines; written based on literature review, with different source such as previous scenario studies, recent studies, policy advice, newspaper articles, etc. In addition, the team will rely on their own expertise and logical reasoning.

2) Stakeholder Participation; by actively involving various experts and groups in the development of the scenarios. A panel has already been formed, which will continue to evolve, and which will be called upon several times during the project. These people are both representative of the various governments, as well as creative outsiders.

3) Design; visualized in maps, location plans, photo montages, etc. The analysis that will be carried out (research by design) will provide important insights, for example on the future geographical or spatial patterns

The research team has chosen these three types, as they do not only best suit our goals, it is also where our expertise lays. This means we will not be undertaking any data analysis. This is something the city of Amsterdam does quite frequently themselves, usually focusing on a particular project and strongly related to feasibility (either programmatic or financial-economic, or both).

8. RESEARCH OUTPUT AND PRODUCTS

The results of the study will be translated into three types of outcome:

a) Spatial and functional principles: Urban, morphological and functional principles, linked to different typologies for buildings and public spaces (relating to density, mixed use, flexibility, and adaptability for many different types of initiatives).

b) Frameworks and public values: Both public as well as institutional preconditions and frameworks. What are the conditions to make projects feasible? These frameworks can be spatial (landscape, street patterns, circular principles) as well as more conceptual (heritage, community, resilience etc.)

c) Development Strategies. Which strategies are suitable to achieve development in the desired form? These three outcomes are more than site-specific. They will generate general outcomes that can be applied to a range of locations in various cities to prepare them for future changes.

These outcomes will be shared in three ways:

1) The principles, frameworks and development strategies will be summarized in the form of a book.

2) One or more events held in 'Pakhuis de Zwijger'- an independent platform for creation and innovation in the city, with daily inspirational programs on creative industry, the city and global trends (de Zwijger, 2016).

3) A website / user-fed platform for various stakeholders to actively participate in the process, sharing articles, essays, official documents, photos, video interviews, videos, etc.

We intent to start the second and third products during the research process, so that they can actively contribute to the content of the research, and enrich the dialogue.

9. CONCLUSION: WORKING TOWARDS A PARADIGM SHIFT

The long-term goal of this research is to generate new insights for urban planning, spatial design, policy makers and politicians, such as:

- The evolution of land use and associated business models, replacing the traditional master planning approach by strategic planning with flexibility, diversity of production activities and a mix of functions as core principles.

- New models for policy makers to facilitate a better interaction in the relations between the city and the surrounding area, creating advantages in the use of space and the changing dynamics of living and working.

- Develop planning techniques that are currently used limited, by putting them into practise, and by doing so creating an additional base for the implementation of these methods, such as a multi-stakeholder approach and extreme scenarios, more specifically a design approach to generate scenarios (in the scenario studies of PBL thus far the design approach has been rarely used - PBL 2013, p.8)

- A guideline for adjustments of policy frameworks to facilitate new flows, nodes and networks.

Eventually, a paradigm shift with a real impact on the way both citizens as well as professionals in the spatial field shape the cities we live in, will contribute to the creation of a resilient future for the city.

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DURBAN, SOUTH AFRICA

"CITIES WE HAVE VS. CITIES WE NEED"

Track V

Intelligent cities for people

Final Report

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1. KEY THEMES

This track focused on smart cities where technology and access to data can be exploited for an unprecedented awareness and control of our built environment. Participants in this track grappled with the question, "while technology flourishes, have the human priorities of these cities been appropriately defined"? The cities of the world are facing a number of new and difficult challenges often at scales unimagined before. To begin with fast pace of population and economic growth and the sheer number of people migrating to cities in search of better lives is unprecedented. That leads to very high demand for housing, employment, transport and leisure. In addition, due to very hyper connectedness people are highly aware of what exists in other parts of the world. The city dwellers thus expect facilities of the highest standard that other places have managed to provide. Intelligent cities try to address those expectations and demands. The following key themes emerge from presentations and papers.

1. Insights from emerging economies The concept of smart city generated great enthusiasm across the developing world. At the urban fringes, the Chinese public sector leads the development of research parks[1] by setting distinct spatial strategies that evolve in response to rapid urbanization[2]. In existing urban areas, Indian planners are debating the definition of smart city vs. people's priorities[3] or, in the case of Jakarta, revitalize the old city while reconciling with ambitious development goals[4].

2. Intelligent cities of developed countries Some cities have been highly successful in tapping technologies for resolving their problems[5]. Others are trying to learn from the successful example such as Boston in attracting young, energetic and creative people[6]. Big data-based tools are developed to assess social media sentiment and inform urban planning practices[7].

3. Planning with big data / complex systems Use of big data from mobile devices, smart travel card and other sensors enables planners to monitor the operation and growth of cities in unprecedented ways. A number of papers in this track present case studies of use of big data is studying and improving various planning related issues such as resilience[8], land use, housing[9], commercial activities[10] etc.

4. Smart transport / infrastructure A number of case studies in this track explore how intelligence/ smartness can assist in improving mobility. The topics in this area range from smart mobility, promotion of non-motorised transport, to integration of the airports to provision of health services. Health, access and equity are recurring and underlying themes in this sub area.

5. Participatory smart planning A number urban planning scholars grapple with the following questions. Who can participate and who benefits from all the intelligence introduced in the city planning endeavours? Are citizen able to participate in consultations related to smart planning? Are their voices being heard? Do planners and policy makers even care if quest for smartness does not engage with the marginalized? Is smartness leaving sections of society even further behind?

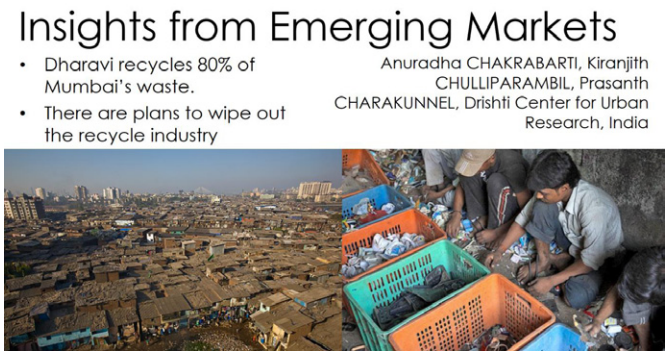
1 Xiaojun Wang: Eco-smart research rarks: Shanxi Science and Technology City case study
2 Xingping Wang et al.: Innovative space of metropolitan area: types, patterns and evolution - a case study of Nanjing Metropolitan Area
3 Charakunnel et al.: The urban conundrum in defining smartness; citizen or technology: a critique into the Indian idea of smart city.
4 Widayati et al.: Old city restoration of Jakarta, Indonesia in terms of realizing the Manhattan of Asia
5 Ludlow et al.: Intelligent city planning - meeting people's requirements?
6 Monardo et al.: Smart specialization strategies for supporting Europe 2020 Vision - looking at the American experience: the case of the Boston Metropolitan Area
7 Huang et al.: Pleasant urban experiences: re-examining place-making theories using social media data in high-density cities
8 Karakiewicz et al.: Ever smarter, cities that learn: the application of complex adaptive systems theory to urban development
9 Cao et al.: Interaction mechanism between urban planning, land supply, housing spatial structure of Hong Kong
10 Ning Zhao et al.: An empirical study on mega-city commercial spaces distribution characteristics: exploratory big-data analysis on Guangzhou, China

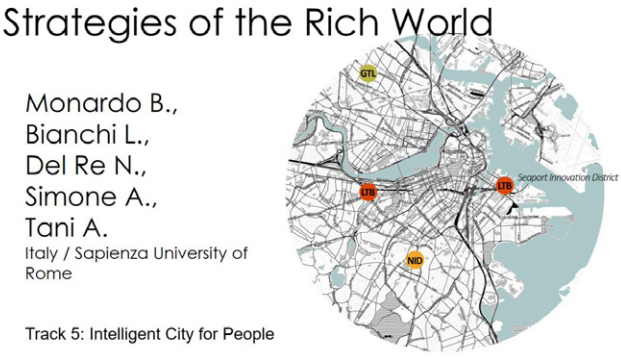
6. Smart energy in cities Intelligent systems are enabling cities across the world to make use of complex, dispersed and renewable sources of power. Smart electricity grids enable the peak and off-peak electricity charging leading to dampening of demand for peak times and thus avoiding the need to build/run peak load power plants[11,12]. Smart energy systems are enabling isolated developing country cities to maximize the utility of off-national-grid local energy generation including that from the renewables[13].

2. CONCLUSIONS

Intelligent cities are not only about ICT manipulation. These are the cities that put people first, learn quickly, and empower and enable participation for innovative and novel solutions. From the protective walls of the ancient cities to the dykes of Netherlands cities have been coming up with clever and daring solutions. Intelligent cities is thus a broad field. The value of this concept lies in the potential it offers in rethinking interventions by city managers and city dwellers typically using the latest technologies to ensure the interventions are clever, out of the box measures.

Planning practitioners, however, should stay alert of the blind following of the intelligent cities concept. In many cases, gizmos are not what people need and the concept should not be mis-understood nor mis-interpretated. Setting the right priority of the intelligent city agenda are particularly important to emerging economies such as South Africa, China, India, Southeast Asia and Sub-Saharan Africa. There, the intelligent/smart city concepts are wholeheartedly embraced without a fair share of skepticism. The notion is attractive for cities in these countries as it offers them the potential to leapfrog on the path to development. It is also attractive because the traditional (unintelligent) measures cannot cope with the needs of sheer numbers of existing and incoming citizens. However, there seems to be some evidence of the excessive use/misuse of the intelligent/smart cities concept to cover up existing and routine measures and developments as a catchy title/phrase. The potentials of intelligent cities are yet to be realized in full.





11 Hunter et al.: Urban energy planning of human settlements: taxonomy, frameworks, and tools to guide planning evaluation and support decision-making
12 Taheri Moosavi: Distributed ledger technologies (blockchain) in urban energy systems, the case study of smart plugs in the UK
13 Ndwandwe et al.: Green energy for African cities - the changing landscape of our cities

The urban conundrum in defining smartness; citizen or technology: a critique of the Indian idea of smart city

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The penetration of neoliberal capitalism into developing countries has manifested into an urge to become technologically and economically smart in line with their western role models. In this context of a technically liberal economy, the borrowed idea of smart cities has taken root into the developmental paradigms of developing countries like India. In India the connotation 'Smart' creates a disconnect, revealing a westernized picture of the digitally smart urban population raised above the inherent religious superstitions on the one hand and a failed attempt to clinch to its age-old cultural heritage on the other. The derived notion of 'smart' oscillates between the contradictions of the Westernized concept of smart and the original local idea of smart.

This research attempts to decipher the contextual and non-contextual notions of smartness and the abstraction of smart cities giving emphasis to the announced 100 smart cities project by the Government of India. The information is evaluated under the concept of spaces of capital accumulation, exclusion, control, monotony, and exploitation. It also identifies the polemic between government's un-proclaimed paramount interest in realizing these cities and the life of the future residents in these invited spaces. By exemplifying the case of Indian cities, the paper demonstrates the vast contextual and evolutionary differences between them and the feasibility and acceptance of the idea of a smart city. The primary focus of the government has been on making smart buildings and infrastructure without taking cognizance of original socio-cultural contexts in creating an environment for smart citizens. The paper analyses the smart city proposals to bring out the inherent contradictions in the formation of urban commons, the right to the city and urban-rural conflicts.

INTRODUCTION

Virtual and physical integration of global economies has led to a paradigm shift in urban studies and discourse, towards understanding the nuances of 'Global Cities,' 'World Class Cities' and 'Smart Cities.' Among these typified urban nomenclatures 'Smart Cities' is a relatively newer subject in developing countries.

Embracing the idea of 'Smart Cities' has manifested a deep urge within developing nations to become technologically and economically smart in tandem with their western counterparts. Saskia Sassen analysed the developed country's idea of implementing such strategized developments into their urban systems in her book 'Global Cities.' The seven hypotheses of the Global City model formulated the base for critical analysis of the Smart City concept. Sassen (2005) firstly states; the dispersal and integration of global economic activities are the key factors for growth and maintaining the significance of central corporate functions, which continues to be located in developed countries. The physical manifestation of such economic activities in developing countries requires more independent, exclusive, technology-driven appropriated spaces, explaining the onset of a radical change in urban planning strategies and management of these states. Secondly, the complexity of the central functioning by corporate in developed countries has led to outsourcing of work functions, which is prevalent in developing countries, due to the provision of cheap labor, new 'greener' spaces for investments and relatively small risks for setting up business. However, Sassen (2005) points out that "for running these highly specific and networked service sectors, well spread out, and efficient physical and social infrastructure are mandatory." This infra are developed under the guise of providing easy connectivity to its citizen in both virtual and physical infrastructure like toll expressway, flyovers and exclusive townships, malls, business parks, sidelining the fundamentals of the

cost-benefit ratio or inclusivity of infrastructure networks in their city. In the quest to become global, more cities, especially those in the developing world, are crumbling under pressure to adopt the private technologically intensive spaces for investment. Sassen's ideas establish that exclusive- technology dependent spaces are likely to be created through Smart Cities in the Indian context.

The growing acceptance for Smart Cities is explained through the writing of David Harvey (2012), who discusses that expansion and interlinking of global economies are imperative for the survival of capitalism, manifested through redefined space, social relations and behavioural patterns. Paramount to this idea is redefining citizenship through direct and indirect measures and will form the crux of the second section of this paper.

THE URBAN CONUNDRUM IN DEFINING SMARTNESS

The reason why defining smartness is an urban conundrum, in the Indian context is exemplified by five examples cited below.

First; The First Five Year Plan of the freshly independent state of India, focused on agricultural development with a substantial chunk of the budget earmarked for dam and canal construction. These dams were constructed to (or "intending to") developing multipurpose river valley projects, in which the primary focus was flood control and irrigation. Presently, almost 69 years since its inception, dams of different capacity, size and focus have dotted the country's map. Mega projects like dam and canal network were considered as smart solutions of those times. However, the recent water crisis across states, which were almost at a brink of a water riot, has once again blurred the future of such mega projects. The widespread drought of 2016 has paralyzed approximately ten states of the country, some of which have the highest canal networks. The stored water from the dams has ceased to reach the agricultural fields affecting approximately two million farmers in the country of which, approximately 2,000 farmers have committed suicide in 2015 and 2016 (PTI . 2016) more in the first four months of 2016 in these affected states. Some experts, not ready to accept this as a mere climatic failure have described it as an "ideological failure, on the part of the nation which has forgotten its farmers" some others have called it "the biggest policy failure." Because in Maharashtra, one of the worst-hit states "in the last 0ten years, INR70,000 crores had been spent on canals and dams, this, however, has added a mere 0.1% percent to the area under irrigation" (Mehta, Fernandes, 2013).

Second, Bangalore, the capital city of the southern state of Karnataka has been boasting about their never ceasing IT boom in the last two decades and is poised to be known as the Silicon Valley of India. However, smartness in the city is only confined to exclusive enclaves like IT parks and the smart/ green buildings in it. Once out from these enclaves, the residents are facing increasing "un-smartness" in basic service provisions like the garbage disposal, unmanageable traffic and pollution which are detrimental to the quality of life. Especially significant in this regard are the lakes of the city. Bangalore, once known as the 'City of Lakes,' 'Pensioner Paradise,' 'Air-conditioned city of South India' (Mani, 1985:2) contributed its salubrious climate to the many natural and human-made lakes in and around it. However, rapid unplanned urbanization has encroached upon these lakes and surrounding green belt of the city to make way for the smart IT hubs. A study conducted by the Indian Institute of Science (IISc) states, the number of lakes in Bangalore declined from 51 with 321ha in 1973 to 17 with merely 87ha in 2007 in the city area. "Similarly, the lakes declined from 159 with 2003ha in 1973 to 93 with 918ha in 2007 in greater Bangalore" (Ramachandra & Kumar in Thippaiah, 2009). Another comparatively recent study by IISc shows the city has lost 79% of its lake in the last four decades, during the same time the build-up area has grown by 52% and the loss in vegetation stood at 78% (Satish, 2016). The fundamental principles of modern day development and the rhetoric of smartness are questioned through the words of Professor T V Ramachandra of the Centre for Ecological Sciences at the Indian Institute of Science (IISc) "What's the point of earning better when the food that you eat is adulterated?" He also added, "As a result of unplanned urbanization, Bangalore is going to be an unliveable and dead city in the next five years." (Bengaluru will be 'a dead city in 5 years', 2016)

Third, one of the worst floods witnessed by the city of Chennai in 2016 drowned significant parts of it and brought everything to a standstill. The death toll has been more than 200 with different offices quoting different figures. The city had a significant wasteland area which acted as a natural drainage network to the high rainfall prone city, siphoning the excess water to replenish groundwater levels. The wastelands not only protected the city from flooding, but it also provided storage of drinking

water, which is a major issue in the city. However, much of the wetlands have been reclaimed to create infrastructure and high-rises permanently sealing off the natural drainage. As per a leading daily (Narasimhan, 2015) statement based on National Institute of Disaster Management (NIDM) report on the status quo of water bodies in the city of Chennai portrays an alarming picture. The water bodies including big lakes, ponds, and storage tanks have been destroyed, and the number have been reduced from 650 to 27. Also, the city has only 855 km of storm drains against 2,847 km of urban roads". First of all, these figures expose the vicious cycle of electoral politics, which requires someone to do something immediately in a span of five years to convince voters of their worthiness without much consideration about the long-term future of such projects. Secondly; a significant amount of taxpayers´ money earmarked for mega infrastructure projects benefits largely private corporate organizations. These organizations are destroying the city's natural drainage system by filling lakes and tanks to build infrastructure and township projects and eventually spending millions of dollars to creat¬e an artificial drainage network for the same city.

Fourth, the rising pollution rate has been choking cities for quite some time; Delhi the capital of India has been witnessing a persistent growth of particulate matter in its air. This situation became worst during the winter of 2015 when the government decided to shut schools for about two weeks to tackle pollution (Biswas, 2015). A study conducted by the Indian Institute of Tropical Meteorology (IITM) has revealed rising air pollution is likely to shorten the longevity of its residents by 6.3 years. The worst affected among them are the vulnerable, who are more probable to stay outside due to lack of proper housing facilities or those making their living on the streets. The urban conundrum in defining smartness in this case, however, lies in the fact that the same government who had once encouraged people to buy more and more private vehicles by making it unfathomably affordable is now planning to impose taxes on the sale of vehicles. The long-term vision for the city, if perceived correctly at the right time in the past would have been to create more Mass Transit Systems (MTS), which not only makes traveling easy and cheap but also impacts the environmental less disastrous, given the urbanization of the city.

Fifth, the landfills of Mumbai have been smouldering, choking and unbalancing normalcy in citizen's life. The largest and oldest, Deonar dumping ground, originally mangroves, was established by the British in 1927, then located miles away from the city. However, rampant urban expansion has currently brought it within the ambit of the formal city and therefore, it is believed five million people reside within a radius of 10km (Subramaniam, 2016). While the Central Government of India's Swatch Bharat Mission entirely revolves around making toilets and cleaning roads, the basics remain unattended. These actions are pointing towards the short-sightedness and loopholes in policy making. Most likely, a plan of setting up a composite plant at Deonar and buying more land to dump outside the city is likely to cost the government $355million (Shrivastava, 2015). However, the basic knowledge of household level waste segregation and door to door collection continue to pose an enigma to the general population.

Smartness has been redefined on the lines of making cities in line with global standards. Economy generation at the cost of parameters like social, environmental and physical factors has changed the behavioural pattern and outlook of city dwellers towards aestheticism. However, the perspective on approximately 175 hectares of land in the heart of the city of Mumbai had changed when the slum of Dharavi won the accolade of being the green lung of the city. Dharavi gives new life to approximately 80% of Mumbai's waste. Known as the recycle miracle of India, Dharavi has been the bone of contention for past several years due to the lucrative land on which it is located. There is an approximately USD 5.25 billion redevelopment plan which is likely to wipe out the recycling industry (MCDougall, 2007), which shoots the question, which citizens are smart? The ones who are creating an economy by recycling the mounting waste or those who are constructing concrete jungles and then sinking under the pressure of their creation. The greatest confusion in defining smartness lies in the understanding of the term smartness, which has ever been altered to suite narrow political and corporate agenda without considering the broader perspective or common interests of the community.

INCEPTION AND FORMULATION OF THE CONCEPT IN INDIA

Investments, urbanization, growth, development and ICT are the key words of neo-liberal societies in developing countries. Space has been at the centre of contention because of its rising exchange value over use value and manifestation of all that above it. In India, the focus on development and gentrification of cities has been a key electoral strategy of 2014 general elections. The incumbent's in their electoral strategy assured to create 100 new cities, enabled with highly westernized technologies to run them.

The conceived central idea for these 100 new cities at a later period (Srivathsan, 2015), which is; after coming to power, morphed into the present 100 Smart City Project, with every state getting at least one piece of the cake. The reason behind the idea was to account for the recurring needs of urbanizing India; nevertheless, the hidden agenda was to create investment friendly cities to attract private, domestic and foreign enterprises remains reprehensible. Another rationale for its development being, with metro cities already reaching saturation, there is a need to invest in uncharted areas, it is easier to establish them as desired cities as they have still not witnessed the complexities encountered by mega cities to open new avenues for investment.

In this context, it is ineludible to understand the 'real' inception of the concept of smart cities in India. It is not an indigenous idea and has been doing the rounds since mid-2000. During the 2008 economic recession in the UK, it was IBM's initiative to sell the idea of smart cities in a big way as a strategy to stabilize and manage their balance sheet during the economic debacle. Empirically proven IBM's performance during the same period, that is 2008-2012, was declared to have not only eluded the downswing faced by the technology business but also have improved steadily (Paroutis, Bennett, Heracleous, 2013). The Bharatiya Janata Party (BJP) led Gujarat government realized this dream during their incumbency in 2012 in the form of GIFT City (Gujarat International Financial Tech City). The Green Field development project, GIFT is "designed as the hub for the global financial services sector. More particularly, state-of-the-art connectivity, infrastructure, and transportation access have been integrated into the design of the city"(GIFT-city portal), everything that is required to make it lucrative for private investment. The presence of the word "financial" in its name is indicative of the idea of attracting foreign and private enterprises to invest in the global GIFT City.

The prompt flip-flop in Smart City concept, from what was initially envisaged by the government bears testimony to the actual intentions behind this Project. It was to create new upgraded spaces to attract investments. The government's initial concept, which was mentioned in the Finance Minister's first budget in 2014, was to create satellite towns for the major cities with modern information technology to accommodate the ever-growing urban population, which otherwise will have adverse effects on the liveability of existing cities (Srivas, A. 2014). This idea came under sharp criticism forcing the government to revisit the proposal and unveil a modified optional plan, to either create new centres or upgrade social and physical landscape in existing cities for the Urban Local Bodies (ULBs) to choose. Therefore, Brownfield and retrofitting were the new strategies introduced by the government along with the current Greenfield development, which continues to remain as a proposal.

Brownfield and Greenfield development will breathe fresh life into real estate development in the city, which will create new 'controlled spaces' of exclusion. These 'controlled spaces' are unavoidable because of the project cost, which can mainly be recovered from the sale of real estate. At the same time, retrofitting, as a strategy is nothing new and our cities have already been coping with the havoc created by metro rail, flyover (Doctor, 2014), laying underground electric cable. The construction of such infrastructure, are mostly short-lived because of the extreme mismatch between expected and actual population for which it is planned.

THE PERILS OF TECHNOLOGY

No matter how superficially inclusive the current development paradigm dominated by Information and Communication Technology (ICT) might appear to be, those roots are deeply embedded in exclusivity.

Sadoway and Shekhar, (2014) states that "In the post-Wiki leaks and post-Snowden era it has become apparent that urban digital networks and ICTs ought not to be seen as neutral, banal, benign or external, hidden infrastructures - but rather as power webs that play a vital role in the co-construction of our daily lives and urban polity." The promotion of ICT as key for expansion of economies across geography explains the logic behind our keenness to include the ICT component in city planning; these new spaces are in the run for becoming Global Smart Cities. The surge in the interest of smart cities can be attributed to the "rise of the networked society, networked cities and networked governance associated with ICTs (Castells, 2008 in Sadoway and Shekhar), including fixed and mobile technologies and the 'internet of things' which is ever-expanding" (Townsend, 2013 in Sadoway and Shekhar).

Global cities like Bangalore, Mumbai or a Shanghai cannot be the prototype for 100 Smart Cities across a country. Variation in city's scope is of utmost significance to ensure sustainability. A holistic idea of sustainability guaranteed by a higher quality of life, economic, social and cultural harmony. Changes in various aspects of a city/region (like, economic structure, territorial endowment, human resource and institutional milieu)(Webster, Muller, 2000) have

positive impact in enhancing the competitiveness of an area/region, thereby pushing the city up the value chain. Here again, the value chain is not only pointing its vocabulary to economics but also to the qualitative, emotional, collective and cultural structure of the chain. Moving up the value chain is crucial for a city to grow, which otherwise leads to stagnation and going forward stimulates decay. New cities developed with limited compatibility to the surrounding region have a short future because while trying to clone prototypes, the real essence of the historical city is lost rendering it lifeless and mechanical. Moreover, Greenfield and Brownfield's development are inducements in which the city is bereft of the experience of its historical evolution and the compatibility which it has attended with its surrounding region while moving up the value chain.

THE GLARING INEQUALITY AND DISCONNECT

Smart technologies are not only altering the urban landscape but also, the social, political and economic linkages of cities. In the case of Indian Smart cities, the proposal is extremely questionable because the proposed smart cities are likely to take up any one 'intervention' amongst, retrofitting, urban development or green field development along with compulsory pan-city strategy (application of selected smart solution to the existing citywide infrastructure). Firstly, this can be rightly decoded as 'A smart space in or around an un-smart city' because the type of interventions proposed will upgrade only a selected area and not the entire city. For e.g. upgrading the drainage network in selected areas for new development raises questions of how shall this advanced network merge with the existing surrounding network, which was previously of the same system. This selective up gradation lead to what urban scholars describe as "Juxtaposition of the citadel and the Ghetto" (Ravindran, 2015). Also, the type of areas selected for this kind of development is important. There can be two possibilities for this, one that the already posh localities be selected for up gradation, where the people living in it has a dominant hold in the political and economic scenario of the city or the selection of a highly dilapidated area. In the second case, people living in those areas will not only lose their livelihood but also a complete transformation in the way of life is likely to occur. The questions arising are whether, if these regenerated areas will camouflage with the urban fabric of the city (economic, social and cultural fabric) or create a disconnect picture. It is more likely to create a city with two contrasting urban spaces manifested as a divided city or a conflict-prone city.

A CITY WITHOUT A HISTORY

A city is an assemblage of reflection of its people, unique culture, and history which together has woven a myriad of stories in every corner. These stories are of its people, their evolution, struggle, failures and victories, which have infused life and dynamism into the heart of cities. Thus, cities have evolved with encounters and experiences witnessed by it. What if we deleted the entire evolution of a city and only leave behind edifices and inhabitants? How would a city without a history or a culture look? That is exactly what a Smart City could be or should we be looking forward to reaching the epitome of smartness towards the climax of a Spielberg movie with created virtual history to the entire city and embed that in the brain of the so-called smart citizens? This is in contrast to the process in which cities had evolved naturally when people settled on river banks or other favourable locations and gradually expanded on space with population growth and economic prosperity. Smart City projects, however, are likely to alter this natural process and build cities which are corpses of neo-liberal capitalism manifested as invited spaces. Citizens do not organically develop these spaces; rather citizens are encouraged/ invited to live in these controlled spaces. Little success has been achieved in the case of similar kind of developments across the globe. Additionally, smart cities are spaces of the future with little or no scope for future changes leading to monotony and constancy. As urbanist Richard Sennet points out, "smart cities" incorporating information technology to improve delivery of services for residents could be a good thing. However, if a city is so overly "smart," so it does not allow any change or future flexibility in its land use, it will not ultimately deliver residents' needs for community or belonging (Stokols, A). A real smart city should be flexible to changes, a dynamic space with abilities to adapt to physical, social and economic changes in terms of relative needs of its residents, because a city cannot be an absolute space, from a Lefebvrian sense, and when it tends to move towards absoluteness, it is likely to be a failure from the very start or in the near future. Therefore, the plan of creating 100 new smart cities in a limited span of five years can be lapped with Harvey's idea of creative destruction in which he states 'urban transformation entails repeated bouts of urban restructuring through Creative Destruction' (Harvey, 2008).

TECHNOLOGY, CONTROL, AND COMMONS

This 'Creative Destruction' Harvey says has a clear class dimension in which marginalized from economic, social and political power suffers foremost. However, Shakespeare writes:

> "What is a city, but the people; true
> the people are the city."

This parallel views on commons, from two different points of time, is pertinent to the Smart City discourse and compels us to rethink the current urban transformation paradigm. The lack of perception, foresightedness or hastiness of public policy makers is likely to reiterate the urban dichotomy currently faced by the nation and further draw the urban life into a deadly vicious cycle of social and political upheaval. A smart city can truly be called smart when it is inhabited by the smart citizen or smart commons. However, the changing priorities and characteristics of the commons, influenced by capitalist ideologies are modifying their ideas and creating a class of new commons. This idea has been put forward by Harvey in his Rebel City where he says "The recent revival of emphasis upon the supposed loss of urban commonalities reflects the seemingly profound impact of the recent wave of privatization, enclosure, spatial controls, policing, and surveillance upon the qualities of urban life in general, and in particular upon the potentiality to build or inhabit new forms of social relations (a new commons) within an urban process influenced if not dominated by capitalist class interests" (Harvey, 2012). Thus, from social perspectives smart cities, are nothing but ramifications of neo-liberal ideas in which, capitalist orientations are likely to redefine the notion of commons with morphed social interests, values, and ideologies.

Harvey writes "the question of what kind of city we want cannot be divorced from the question of what kind of people we want to be, what kinds of social relations we seek, what relations to nature we cherish, what style of daily life we desire, what kinds of technologies we deem appropriate, what aesthetic values we hold" (Harvey, 2008).

A country where, 300 million people live without electricity and more than double without access to proper toilets (Rani, D. 2015), renders more focus to comparatively trivial aspects like smart traffic management, smart metering, and surveillance cameras is nurturing inequality and raises questions on the priority and focus of the government. It is unclear for whom are we managing traffic or spending taxpayers' money to improve facilities like installing surveillance cameras. Is it only for people who can afford a car or stay in a posh locality accessorized with surveillance cameras? In this context, it is significant how we define the commons for whom we are planning. Is it the 'new commons' inhabiting these capitalistic spaces and constituting only 1% of the nation's population or 'the commons' living their life in the true sense of the term and struggling to attain the basic requirements? The next question which comes to our mind is with widening social and economic gaps how long can these two classes co-exist in harmony? This has already been explicated by Lefebvre in his theory of Space (Lefebvre, H. 1991), which when lapped with neo-liberal smart spaces explains that these new spaces are "abstract spaces" which are cradles for "differential spaces" or spaces of conflict in the form of protest and social turbulence. According to Laveesh Bhandari (Ravindran, S. 2015), "smart cities are 'special enclaves' demonstrating various control mechanism to keep the poor people at bay or else they are likely to nullify the efforts of maintaining such pricey infrastructure."

Harvey discusses how control mechanism adopted by capitalists is important to enjoy the fruits of neo-liberalism. Capitalism is meaningless without control. However, the idea of control in the case of smart cities is a slightly complicated one. A dual control mechanism will prevail in these smart spaces. The dichotomy of control has already been well depicted in Palava 'smart' City, which is being developed with state of the art infrastructure and the technology for it is being furnished by the international technology giant IBM, initiator of the Smart City concept. Palava City is likely to hand over identity cards (Smart Identity Card) to its citizen, which is to be furnishing for entry to the city. Therefore, space is forbidden from entry by one group of people by using identity card as a control mechanism. Likewise, 24x7 surveillance cameras are set up to monitor every activity of the residents. This control mechanism raises questions on the right to privacy of the citizens. Where on one hand surveillance has proved efficient in crime management to some extent, on the other the control of monitoring system in the hands of government or private entities has exposed the risk of infringement into personal space and security. National Security Agency, USA whistle-blower Edward Snowden in a chat session highlighted how overarching surveillance measure designed to improve security is eroding the freedom of those it is supposed to protect:

"The worst and happening-right-now harm of bulk collection - which again, is a euphemism for mass surveillance - is two-fold. The first is the chilling effect, which is well-understood. Study after study has shown that human behaviour changes when we know we are being watched. Under observation, we act less free, which means we effectively *are* less free. The second, less understood but a far more harmful effect of these classified programs is that they effectively create 'permanent records' of our daily activities, even in the absence of any wrongdoing on our part. This two-fold surveillance enables a capability called 'retroactive investigation,' where once you come to the government's attention, they have got a complete record of your daily activity going back, under current law, often as far as five years. You might not remember where you went to dinner on June 12th, 2009, but the government does" (Lee, 2014).

The Supreme Court has recently curbed the Indian government's initiative to make Aadhar Card (UIDAI-Unique Identification Authority of India) compulsory for various government and non-government facilities because of its breach of Right to Privacy (Anand, 2015). Standing at this threshold the usage of surveillance cameras to record citizen's activities is also under the scanner. The existence of database on citizen's activities with a private entity is a serious threat and breach of personal security. These data can be easily manipulated by anyone with the display of power and wealth. Thus, the poor are being controlled, from entering the space, for their lack of ability to pay for these services; on the contrary, the rich are being controlled for their capacity to pay for the same.

CONCLUSION

The minimum condition of providing basic services to its entire population is still a distant dream for India. Expenditure on public health has continued to remain excessively low over the years. During the 2014-15 budget, there has been a further cut of approximately 20% in the healthcare budget citing issues of a fiscal strain (Kalra, 2014). However, in the same year big-ticket urban regeneration projects like the Smart City was launched. The extravagant budget for these projects comes at the expense of essential services for the poor, who constitute the majority of the country's population. Above all, there was a 30% slash in the country's HIV/AIDS program in the same year (Kalra, 2015). On similar lines in 2015-16, the health care budget continued to remain stringent, while corporate tax was reduced by 25%, leading to 17% less burden on corporate organizations and therefore magnifying the role of private players in all sectors including healthcare (Iyer, 2015). The smart city project is an initiative to further increase the profitability of the private players across sectors through service provision for smart spaces. It is unknown what all services in the smart city will be required to be paid, which will be barely affordable for the masses who are struggling to acquire essential services like food, clothing, and shelter. People giving up their land for re-development will look for profit and not for the betterment of the condition of the vulnerable. Meanwhile, greenfield developments will require a hefty price, which will be out of the league for the poor. Smart cities are likely to contribute little to shortening the 114 million demand supply gap of housing units by 2018 (Khan, Y.Z. 2015). Even though the policy writes down the plan of creating 15% affordable housing in smart cities (Government of India), given the unclear definition of affordable housing in India these too are likely to be priced to fit the budget of the lower middle class and remain unaffordable for the masses living without shelter. The discussion on Priority Vs. Profitability of smart cities also holds good in the case of internationally purpose-built smart cities. For instance, according to Antony M Townsend, in his 2013 book 'smart cities', Songdo smart city was originally conceived as "a weapon for fighting trade wars"; the idea was "to entice multinationals to set up Asian operations at Songdo ... with lower taxes and less regulation" (Poole, 2014).

From all these discussions of defogging the idea of smart cities, the essence of smartness which government tries to portray is at a nascent stage. It is just prefixing or suffixing the so-called jargon "Smart" in front of the layman's vocabulary, which in turn creates a virtual pool of sophisticated imaginations to render the smart cities as the only future of developing India. 'Smartness' can rightly be defined as a process rather than a goal. The idea for smart cities should be to attain holistic smartness, where paramount are smart citizens. It is fundamental to understand the role of a citizen in making a city. Roads, bridges, transport networks, buildings and sewage processing machines will have no meaning without citizens. It will not only widen the existing inequality among classes but also, enhance fundamental issues of lack of contiguity, capital accumulation, and social-cultural disconnect. Developed as consequences of privatization, surplus accumulation, control and surveillance, these impeccable spaces or so-called smart cities are distant from the familiarity of the commons and it is impossible to bridge the gap between the familiar and the unfamiliar permanently. These spaces will

alter the history of city formation and thereby the idea of liveability, community, neighbourhood and public spaces; thereby creating 'special enclaves' of exclusion. Just as democracy is fundamental to development, undemocratic means are fundamental to capitalism and by falling prey to such measures we are sowing the seeds of a debacle or apocalypse.

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How integrated is the airport in the production of space?

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The study explores the movement of goods through airports in order to understand the relationship between flows and the production of space, and specifically how integration occurs between modalities and land uses within the context of the Dube TradePort case study. The initial review finds that the fields of transportation geography and logistics provides some useful insights for understanding airport related development within a planning perspective.

1. INTRODUCTION

The international movements of goods start and terminate in cities at either port terminals or international airports, and these act as the nodes where international trade interfaces with regional and local trade flows (Cui et al., 2015, Rodrigue et al., 2013). The complexity of these global and regional flows across multiple locations and modes of transportation impacts on cities, places challenges for improved planning of land use and the movement of goods around airports (Schaafsma, 2010). Historically, the focus of international trade flows on urban development relates to ports. However, air transportation has grown internationally over the past two decades and airports play a more critical role in the internationalization and globalization of trade (Button and Taylor, 2000, Dicken, 1998), particularly related to the relative value versus volumes of goods handled by air as opposed to maritime shipping. The integration of global flows with city flows, presents complexities for both the distribution of goods and the logistics activities on urban development and land use.

The main argument in this paper is based on an extensive literature review and finds that, while airports shape the production of space across a range of scales, conceptually it is helpful to understood these processes in terms of their connectivity to broader markets and integration with land uses, rather than through models of airport centered development. The initial findings from a case study of an emerging greenfields cargo and passenger airport in Durban, suggests that airport related development should be understood within broader scaled contexts to understand processes shaping space. The literature review provides the context for the introduction of the case study and the paper concludes with some of the preliminary findings based on the literature review, policy review and initial interviews.

This paper is the first part of a broader research project focuses on the role of airports to support the efficient movement of goods between the global and regional economies, through improved logistics at the local scale. The main research question is concerned with how in fact airports, as precincts containing specialized infrastructure and related uses, interact with the flow of goods distributed across different transportation networks. Then there are there are derived planning implications for land uses across local, regional, national and global scales, within a normative, inclusive growth framework. The broader study focuses on the case study of Dube TradePort, incorporating the King Shaka International Airport.

1.1 Defining logistics

The definition of logistics from a transportation geography perspective has relevance for this study and the framing of the research questions. Logistics according to Hesse and Rodrigue (2004) refer to `the wide set of activities dedicated to the transformation and circulation of goods, such as the material supply of production, the core distribution and transport function, wholesale and retail and also the provision of households with consumer goods as well as the related information flows'. The definition implies two major interrelated functions of logistics. The first relates to the physical distribution function, with the derived transport segment, and secondly the materials management function with the induced transport segment (Hesse and Rodrigue, 2004). Physical distribution is the `movement of goods from the point of production to the point of consumption and materials management includes all the activities related in the manufacturing of commodities in all their stages of production along a supply chain' (Hesse and Rodrigue, 2004). The definition of logistics suggests the consideration of both the physical distributions of goods and

flow of goods in the production process, requiring interventions to minimize `logistic friction' that impede flows (Hesse and Rodrigue, 2004).

Inherent in this spatially constructed notion of logistics is the idea of pursing optimal integration between modalities as one layer and the integration between places of production distribution and consumption as another layer. The framework allows for a relational understanding of how infrastructure, designed to interact with the flow of goods across networks, holds possibilities; and how these flows can integrate with broader land use processes.

Hesse (2008) argues in the context of Western European and the United States case studies, that modern logistics are shaping urban development patterns due to changes in supply chain management practices. On the basis of empirical studies, Hesse (2008) identifies `new geographies of distribution' attributed to changes in supply chain management and logistics management design, with impacts on urban places. Transformations include the redevelopment of warehouse districts, railway yards and freight consolidation facilities by more competitive uses and secondly the relocation of logistic services related to the storage, consolidation and distribution of goods, towards strategic places outside of the urbanized center (Hesse, 2008). Hesse (2008) identifies the locational requirements of relocating logistics firms to include the availability of land, access to transportation and distribution networks as some of the factors behind the suburbanization of logistics related uses. However, there are exceptions where customers of intermodal services have fixed locational behavior and require close access to ports, railyards or airports (Hesse, 2008). O'Connor (2010) in his study of global city regions and the location of logistics activity, looked at the combined analysis of both sea and air freight activity on city regions. He explored the particular effect of infrastructure on logistics locations and concludes that global city regions with multiple seaport and airports play a particular role in attracting logistics firms and the dynamics of these places create challenges for strategic urban planning policy (O'Connor, 2010). However, much of the research on airports is based on the developed world, yet in developing countries the impact of these flows, particularly those related to the production of goods, require further exploration in South Africa.

1.2 Defining Integration

Integration in this study refers to the physical and spatial dimensions drawing from the field of transportation geography. This is distinct from a planning conceptualization where Schoeman (2015) refers to `processes and methodological approaches and procedures followed in planning processes through application of specific instruments and/or planning tools '. He goes onto argue that given the methodological and process emphasis in planning, the terms of alignment and integration are sometimes used interchangeably.

Air transportation forms part of the networks and nodes in the physical distribution and the materials management function and would need to integrate with other modes of transportation and production, storage and distribution uses in order fulfil this logistic function. Rodrigue et al. (2013) define networks, nodes, flows and argue that transportation networks underlie the territorial organization of economic activities in space. Networks provide the `framework of routes within a system of locations, identified as nodes. A route is a single link between two nodes that are part of a larger network that can refer to tangible routes such as roads and rails, or less tangible routes such as air and sea corridors' (Rodrigue et al., 2013). The impact of hub and spoke networks versus point to point networks have implications for how and where goods move. Freight and passenger services tend to hub and spoke models and while there are efficiency arguments, places outside the hubs have additional transshipment costs and hubs experience congestion issues (Conventz and Thierstein, 2015). A recent review of urban logistics and airport centric development, has argued for the emergence of city logistics to deal with the congestion challenges of growing demands for freight transportation and distribution within city regions (Boloukian and Siegmann, 2016). The Europe based study also identified complexities and conflicts between city logistics with broader national, international logistics, making the case for the convergence between logistics and airport-centered development on issues of urban competitiveness (Boloukian and Siegmann, 2016). However, in the context of a secondary South African city, firmly outside of main air hub and spoke, but acting as a major port and container gateway to south Africa, the dynamics of integration pose broader issues than the physical dimension to integration. How does the city region interact with the movement of goods to balance strong integration with local employment creation and yet promote a more optimal modal split to ensure broader national efficiencies and competiveness, and all with in a normative sustainability framework?

The integration is more than the physical infrastructure and efficient goods handling in

distribution process, but also includes the spatial dimension of how the distribution of goods integrate with the production of goods and ultimately with places of consumption. The location of land uses and activities that deal with distribution, production and consumption processes have implications for the field of planning. Planning, as a practice, attempts to mediate private and public investment and locational decisions in the public interest. The formal scope of the planning system in terms of the Spatial Planning and Land Use Management Act No 16 of 2013, includes the preparation of future spatial development frameworks by government based on principles, norms and standards that guide planning and land development, as well as the management of land use and the procedures and processes for approval of future land development (Republic of South Africa, 2013). While the framework for planning suggests a rational process, the practice of planning deals with the unintended consequences and impacts of land use decisions. The impact of airports and logistics have significant impacts on adjacent land use, to warrant planning decisions that balance social, environmental and economic interests through a normative framework.

1.3 The Challenge

Growth in the quantity of freight traded internationally, combined with the complexities of goods moving between dispersed origins and destinations, points towards an important role for international transportation in supporting the global economy (Rodrigue et al., 2013). Approximately 90% of global trade volume is handled by ports and maritime shipping. However, although airports handle 0.2% of global tonnage they account for approximately 15 percent of the of global trade value (Rodrigue et al., 2013). Road and rail infrastructure play a marginal role in international trade, but are critical in moving goods to and from port and airport terminals with the challenge of integration between modes of transportation at the city scale. With improved technologies and changes in the supply chain, airports have become important nodes in, not only in the movement of people, but specifically high value and perishable goods (Charles et al., 2007). However, despite the well reported environmental externalities of aviation (Charles et al., 2007, Kivits et al., 2010, Hesse, 2013), the use of airports continue to grow and provide the infrastructure to deal directly with international trade with the potential for regional economic growth (Schaafsma, 2010). With the reported growth in passenger and freight airports and their contribution in regional and national growth, there has been academic and practical interest in issues related to airport development (Hesse, 2013).

Airport led development, as a planning concept, is associated with strategies to engage with global economies. Underlying the relationship between airports and economic developments, are claims of regional growth and employment associated with airports. Green (2007) argues that airports may be a function, as well as a cause, of economic growth. However, passenger activity as opposed to cargo activity, is a better predictor of economic growth. Brueckner (2003) in his study on traffic and urban economic development found a link between passenger numbers and increase in employment in service related industries. However, airline traffic was shown to have no effect on manufacturing and goods related employment (Brueckner, 2003). Reductionist claims that investments in airport infrastructure will lead to agglomeration of firms with increase in employment and growth, often overlook the complexities of context dependence. The direct, indirect and multiplier links between airports and economic development is shown in the literature as complex depending on the split between passenger and cargo focused operations, connectivity, economic growth (Green, 2007, Kasarda and Green, 2005, Brueckner, 2003). The questions for Durban, particularly on cargo focused operated operations, relate to determining growth over the relatively short, six year operations and whether this growth translates into employment and how much of the growth is new as opposed to displaced development. Added to this are considerations of the demand and supply of locally based services and production volumes to build on airfreight capabilities and their related global value chains.

There are complexities in the integration between the airports and other modalities in the distribution of goods (Rodrigue et al., 2013). Rodrigue et al. (2013) argue that these relate to the interface between global trade with city logistics, where cities have their own dislocation between production, distribution and consumption, combined with globally dispersed places of production and consumption. The lack of integration is reflected in the transportation geography literature that tends to focus on specific modes of transportation rather than in the linkages between multiple modes in the distribution side of logistics (O'Connor, 2010, Hesse, 2013). Similarly, in the field of planning there is a siloed approach where the planning and provision of transportation infrastructure (ports, rail, road and airports) and related land use planning are planned separately. However, the practice of

logistics involves and requires the coordination of activities and integration between multiple modes of transport (sea, land air and rail) depending on the goods and value chains (Rodrigue et al., 2013). There is agreement in the literature that airports and the associated development of broader than aeronautical services, that airports are not just transportation infrastructure but play a part in the production of urban space across scales. Airports are places that interface between global and local movement of goods and people, or "spaces of flows" (Castells, 1996) within a city region. Freestone and Baker (2011) in their review spatial planning models of airport driven development identify topologies of airport city regions with models for development and review the implications for planning. They conclude arguing for better balance between local sustainability, national interests and international dynamics, stronger alignment between city and airport planning alignment and a more collaborative approach between local and regional interests

While these conclusions are relevant for Durban, particularly while the space for planning the airport region is still fluid, there are a few strategic issues that can also shape some of the regional impacts. The questions for Durban are how does the airport integrate with established port related infrastructure, largely road based movements, and established rail infrastructure on the one hand, and exactly what types land uses integrate with the Airport and why.

2. LITERATURE REVIEW

The purpose of this section is to review a sample of literature relating to the transportation of goods and the relationship to space, largely within the field of transportation geography and planning and to review literature on the concepts that link the economic processes to the movement of goods, in order to provide a context for logistics broadly. Secondly the literature is examined from the perspective of how prominently airports feature in physical logistics and how integrated are logistics with other modes of transport and land uses in the movement of goods at a range of scales.

2.1 What are the relationships between transport and urban development across global, national, regional and local scales in the context of globalization?

Theoretical insights into the interplay between transportation, economic activity and urban development are complex and straddle a range of disciplines (Hoyle and Knowles, 1998). However, the common element in these relationships relates to how the reciprocal interactions between transport and urban development are expressed across space and at various scales. The emphasis on multiple scales are a common concern for planning and geography, particularly in the context of globalization and the impacts on contemporary cities.

The review of the link between the economic activity, the movement of goods and space is located within the contemporary period of globalization. The impacts of internationalization and globalization on economic activity have profound spatial implications for the relationships between producers and consumers and the transportation intermediators that connect them (Hall and Jacobs, 2010). However, despite the long distant spatial extent of these relationships, the increasingly integrated nature of the supply chain systems also characterizes how the production, consumption and distributions of goods relate. Dicken (1998) in his discussion on the `global shift' in the world economy makes the distinction between `internationalization' and `globalization' processes at work in contemporary economies (Dicken, 1998). Globalization is defined as a `complex of interrelated processes, rather than an end state' (Dicken, 1998). Internationalization processes are simply the `extension of economic activities across national boundaries' whereas `globalization processes are qualitatively different' and relate to the `functional integration of such internationally dispersed activities' (Dicken, 1998). In this research, specially relating to the transportation of goods by air, the context of globalization is important to understand the role of transportation in globally dispersed production processes. However, the interest is not on a national scale unit of analysis but at a local site level, where an understanding of how transportation relates to the location of production chains or commodity chains, and expressed as site level land use.

Production chains are defined by Dicken (1998) as a `transactionally linked sequence of functions in which each stage adds value to the process of production of goods or services' and these chains are increasingly global in the location of these functions, and where transnational corporations increasingly play a role in the coordination and control of operations in more than one country, even if they do not own them (Dicken, 1998). The review on production chains is limited to understanding the role of transportation and airports in relation to how goods move within supply chains. The debate on how globalization relates to regional development from the perspective of new regionalism or from the perspective of global commodity chain/global value

chains (GMC/GVC) have been excluded from the review, largely related to unit of analysis necessary in this inquiry. The new regionalism literature has been critiqued for the preoccupation with local transactions and institutional forms at the expense of connections beyond the region, while GMC/GVC have been critiqued for the preoccupation with the national scale (Coe et al., 2004). Neither perspectives give specific insights in understanding the role of the airport from a case study perspective. Rather than study a global city region to give insight into the role of the airport, this research will be approached from the role of the airport in the context of the city region to provide insight to the functional region serviced as well as integration with other modalities (Hoyle and Knowles, 1998).

2.2 What are the conceptual dimensions of `flows'?

An understanding of how the globalization of economic activity in contemporary cities has impact across scales draws from the work of Castells (1996). The concept of flows contained in the work is useful to understand how networks of flows operate at multiple scales and how flows can be applied to distinguish between physical and functional definitions of cities or regions (Castells, 1996). This is important as the functional flows provide an argument for why the analysis of goods flow relates to the city, regional, national and global scales. Castells (1996) makes a useful conceptual distinction between `space of places' and `space of flows'. The `space of place' is a physical `locale whose form, function and meaning are self-contained within the boundaries of physical contiguity' (Castells, 1996), and where the `space of flows' is more functional and relates to the `material organization of time-sharing social-practices that work through flows' and networks (Castells, 1996). Furthermore, the work of Castells (1996) also clarifies various dimensions to flows and assists with a narrow focus for the study on how goods flow as the physical expression of flow. Flows in the broader sense refers to the `flows of capital, flows of information, flows of technology, flows of organizational; interaction, flows of images, sounds and symbols ' and `representation of processes dominating' the economic, political and symbolic life (Castells, 1996). In this study flows relate to the observable movement of goods, while recognizing that other flows may accompany these flows.

2.3 What are the relationships between the airports and urban development across global, national, regional and local scales in the context of globalization?

The linkage between investment in transportation infrastructure and spatial and economic development of regions are widely accepted at a broad level. However, within the context of globalization and changes in contemporary cities, the methods for analyzing the linkages between transport and urban development are contested (Banister, 1995). In the contemporary context of air transportation and economic development, it is argued that the direction of the linkage is also sometimes unclear, particularly when considering local pollution and congestion concerns against positive regional benefits (Conventz and Thierstein, 2015). This study will attempt to shed light, from the perspective of a case study, on how investment in air transport infrastructure impacts on economic activities related to logistics.

In a quantitative study by O'Connor (2010) on the importance of airport regions in logistics activity, where the global city regions provided the unit of analysis rather than the port or airport, it was found that regions containing multiple sea and airport cities played a more significant role. The study suggested the importance of infrastructure capacity and accompanying hub role, as a critical factors in shaping the location of logistics activity (O'Connor, 2010). The quantitative study by Wandelt and Sun (2015) on the evolution of international air transportation country network from 2002 to 2013, also emphasizes the importance of air connectivity. The study, using physical and functional topologies, provided some useful insights on the roles of countries in international air transportation flows. Despite relatively low air passenger volumes, according to the study South Africa plays an internationally significant role topologically due to the number of inter-continental air connections.

Internationally, and in South Africa, substantial contributions to the business case for airport development are based on the concept of `Aerotropolis' developed by John Kasarda (Kasarda and Lindsay, 2012). Much of the practice led research, led by Western European examples, tends towards the use of concepts such as `airport cities'

and `airport corridors' and `airport regions' where the airport is viewed as an economic generator or catalyst for growth. However, the debate on airports has shifted away from the role of the airport as a generator of growth, particularly when linked to a rationale for airport expansion, to questions about the role of the airport in shaping the city region structure (Conventz and Thierstein, 2015). This study will contribute to this debate from a perspective of a case within the developing context of the Global South.

Methodologically there are challenges in a study to establish or monitor the clustering of economic activity in response to an airport. In an established airport region, the sequencing of firm locational decisions before and after the infrastructure are difficult to isolate in a quantitative study. In the case of Dube TradePort site, incorporating the King Shaka International Airport, which opened in 2010, evaluative studies would find it difficult to monitor the economic impact of new development over this relatively short time period of five years. There are several reasons for this, including that relocation and investment decisions of firms would have been made prior to the approval of the airport relocation decisions.

2.4 The theories that inform the relationship between transportation and spatial development

Traditional spatial theory has been broadly concerned with the role of transportation costs and the exchange of goods and the related impact on urban development (Hesse and Rodrigue, 2004). The study will review traditional spatial theory, focusing on transportation and spatial development, while being mindful of the contextual shift of contemporary cities with globalization. Early spatial theories include work by von Thünen (1826) on land value (Knowles et al., 2008), Burgess' concentric model (1925) (Rodrigue et al., 2013) and the work by Christaller (1933) on central place theory (Herbert and Thomas, 1997). This research draws on locational theory to draw the broad linkage between economic activities, the use of space and transportation costs. Early location theories were influenced by the work of von Thünen (1826) who provided a model to understand how the economy organizes the use of space and considers transportation costs through an analysis of land rent and use (Krugman, 1991). Central place theory also assisted locational theories to explore how economies of scale and transportation costs interact to produce a spatial economy through the work of both Christaller (1933) and Lösch (1940) (Krugman, 1991). While these models are useful in terms of relating transport, economic activity and urban development, they should be understood within their historically context. Locational theories can be applied to explain the links between transport and urban development. Classic locational theory assumes that accessibility determines the value of land in particular locations and that as transport costs change so do rent levels (Banister, 1995). The classic locational theories are now critiqued for limited explanations afforded and a simplification of time (Banister, 1995).

Krugman (1998) argues that within locational theory, transportation costs are a consideration in locational choices of firms. Economic geographers however tend to assume the iceberg effect with respect to transportation costs. The argument is that transport costs are incurred at a constant rate when goods move and that that a portion of the goods' value simply `melt away' in transit (Krugman, 1998). New economic geography seeks to explain the spatial structure of the economy through modelling the concentration of economic activity (Krugman, 1998, Fujita et al., 2001). The new economic geography marks a departure in the 1990s from location theory and the work is primarily led from the writing of Paul Krugman on geography and trade. New economic geography argues that `better and cheaper transport will generally promote concentration of economic activity in favored locations' (Knowles et al., 2008). While the new economic geography may provide insights into concentrations of economic activity in contemporary economies, there are critiques on the assumed role of the state to promote a free market. Peck and Yeung (2003) critique the new economic geography approach as associated with neoliberal policy implications of the discourse. The debate on competition and competitiveness between city and regional economies is polarized between Krugman (1998) who argues that places and regions do not compete but firms do; and Porter (1998) who argues for the clustering of companies in particularly cities and regions. The latter view creates a strong argument for transport and ICT infrastructure to support the development of regions through the flow of goods, services, information and people (Docherty, 2004).

Despite the extensive literatures on the shifts in organization of economic activities within the context of globalization, the field of transportation geography partially addresses concerns related to the physical distribution of goods related to economic activities on space and urban development (Hesse and Rodrigue, 2004). Transportation geography

emphasizes the movement of passengers over the movement of goods. Over the past decade a number of academic contributions have responded to this gap and the transportation geography of logistics and freight distribution has emerged albeit with a developed country context bias (Rodrigue et al., 2013).

The development of large scale transportation infrastructure to facilitate the flow of goods, and industrial land uses that generate and depend on the flow of goods, is an enduring feature in the planning and development of cities across history (Hesse and Rodrigue, 2004). However it is interesting that the field of planning, and particularly local planning research, is relatively silent on the substantive issues related to logistics infrastructure more broadly and airport development in particular. The planning literature tends to equate investment in airports and ports as mega projects invoking critiques framed as the consequence of neoliberal discourse. In the built environment, the local contributions to airports literature tend also to be project-specific critiques of broader neoliberal discourses (Robbins, 2014, Todes, 2014). However, these critiques do not necessarily reflect on the practice of how airports relate to local or regional spatial economy in order to inform and change planning contributions; neither do they engage wth the dynamics of connectivity between global and local economies. Mokhele (2016) in the context of South Africa has contributed towards a framework that describes and explains forces that drive the location and mix of airport-centric developments around the Cape Town and OR Tambo airports. The study found that transport-oriented firms (such as couriers and freight carriers) formed anchors around airfreight services of the airport.

3. CASE STUDY IMPLICATIONS

The case study presents a broad practical issue of implementing infrastructure-led development policies, focusing on air transport and logistics to support economic growth, with challenges for planning. The theoretical problem relates to the broader debates on the relationship between transportation and development and how the emerging role of air transportation relates in the process of spatial change in contemporary cities and draws on notions of `production of space', where social space is argued as a social product (Lefebvre, 1991).

The growth in freight and flow of goods and the related land use to support logistics have placed demands on the current distribution and production systems globally, prompting a policy and planning response (Hesse, 2008). The key issue is that logistics activity is not without planning and sustainability challenges, which is compounded when economic, social and environmental interests engage in struggles over public interest objectives. However, aspects of logistics and especially the movement of goods, is not necessarily completely open for public engagement, despite public impact and policy imperatives for engagement (Hesse, 2008). Parastatals, government and local interests have differential access to influence over investment and operational issues. Within the broader logistics phenomena, the case of the Dube TradePort, provides an opportunity to explore the planning and policy implications emanating from reflective practice. Forester (2013) in his work on critical pragmatism and building on ideas from Donald Schön (1983) on the Reflective Practitioner argues that `reflective practice' provides planning with analytical tools to construct alternatives from conflict (Forester, 2013).

Governments worldwide are investing significant resources in logistics in order to engage in the global freight transportation network (Rivera et al., 2014). South Africa is no different in this regard. Logistics are both a factor in the competitiveness of the economy as well as an output that reflects the performance of the economy (Ittman 2010:1). In South Africa, the annual reports on the relationships between transportation infrastructure and logistics are reported in the Annual State of Logistics surveys. The Annual State of Logistics Surveys between 2004 and 2014 provides quantitative reports by the Council for Scientific and Industrial Research (CSIR) on the movement of goods and freight in South Africa. In a most recent survey, the logistics costs as a percentage of Gross Domestics Product (GDP) have for the period 2011-2013 remained stable at 12.5% and are estimated to have been R423 billion in 2013 (Council for Scientific and Industrial Research, 2013). South Africa is ranked as 34 of 160 countries according to the Logistics Performance Index (LPI) for South Africa, and this is compared with 23rd out of 155 countries two years prior (Council for Scientific and Industrial Research, 2013). Transport costs forms the largest component of logistic costs in South Africa, where in `2012 transport costs accounted for 61.2% of logistics costs, in 2013 this percentage is estimated at 61.6%. In 2003, the global average for transport costs' contribution to total logistics costs was 39%6 (Council for Scientific and Industrial Research, 2013). The Annual State of Logistics Surveys between 2004 and 2012 are relatively silent on the role of airports in logistics performance. However, the 10th Annual State of

Logistics Survey recognized airports as logistics enablers. It was reported that approximately 400 tons of cargo annually are transported by air and 80% in the belly of international passenger flights (Council for Scientific and Industrial Research, 2013). This research aims to draw attention to the issue airports and logistics by critically reflecting on the role of airports in logistics.

South Africa is strongly committed to infrastructure-led development and this is reflected in the National Development Plan (2012) plan to eradicate poverty and reduce inequality in South Africa by 2030 (National Development Commission, 2012). Part of the strategy targets the expenditure of 10% of Gross Domestic Product (GDP) on public infrastructure investment. The income to support expenditure on transport, energy and water infrastructure will be financed through tariffs, public-private partnerships, taxes and loans and focused (National Development Commission, 2012). The focus on public infrastructure investment to support efficient movement of goods suggests a reduction in the cost of trade and this in turn impacts on economic efficiencies and growth and, ultimately, poverty alleviation. Furthermore, the National Infrastructure Plan (2012) identifies a number of Strategic Integrated Projects (SIP), largely socio-economic infrastructure investments to support freight growth (Presidential Infrastructure Coordinating Commission, 2012) and this includes the Durban-Free State-Gauteng logistics and industrial corridor SIP 2, which intends to strengthen the logistics and transport corridor between South Africa's main industrial hubs and to improve access to Durban's export and import facilities (Presidential Infrastructure Coordinating Commission, 2012).

The Dube TradePort site, incorporating King Shaka International Airport and Dube Cargo Terminal, and surrounded by development zones, operates as an air logistics platform, and is currently being planned and developed as the largest infrastructural project in the Province of KwaZulu-Natal (Dube TradePort, 2015). Furthermore the Dube Trade Port development is planned and purpose built to move freight efficiently as part of the strategic infrastructure required to support the Provincial Growth and Development Strategy (Provincial Planning Commission, 2013). However, despite South African policy and expenditure support for the efficient movement of goods, the optimal integration between the airport, within the Dube TradePort site, with other modes of transport (roads, rail, and ports) is unclear (Provincial Planning Commission, 2013).

The Dube TradePort site is located some 30km north of the port city of Durban, in KwaZulu-Natal, on South Africa's eastern seaboard. The initial 2 940-hectare development, although recently expanded to include new land holdings, contains King Shaka International Airport and Dube Cargo Terminal. The site is also 45 minutes north of Africa's busiest cargo port, Durban Harbor, and 90 minutes south of the Richards Bay Harbor. On the cargo side of the business, the Cargo Terminal is supported by Dube TradeZone 1 and 2 on the site, as a serviced industrial land for the development of `warehousing, logistics and distribution, manufacturing, assembling, air-related cargo distribution, high-tech aerospace services, pharmaceuticals, electronic manufacturing, automotive industries, clothing, textiles, and cold storage' (Dube TradePort, 2016a). The cargo terminal is also supported by Dube Airoad, a road based logistics fleet, intended to move time sensitive goods between the terminal and other centers.

More recently in 2016, Dube TradePort has been proclaimed as the only Special Economic Zone (SEZ) in the province (Dube TradePort, 2016b). While the take-up under the SEZ provides incentives from the South African Revenue Services, development in the zone is not exempt from labor, environmental and related legislation. The location of the SEZ at the airport, supported by significant infrastructure, incentives and government support, specifically targets the sectors of `aerospace and aviation-linked manufacturing and related services; agriculture and agro-processing, including horticulture, aquaculture, and floriculture; electronics manufacturing and assembly; medical and pharmaceutical production and distribution; and clothing and textiles' (Dube TradePort, 2016b).

4. PRELIMINARY FINDINGS

Some of the preliminary findings from the case study interviews, documents review, land use analysis, are outlined below:

1. Dube TradePort, including the Cargo Terminal Facility and TradeZone onsite industrial estate, are designed and purpose built as a multimodal facility to support the efficient and value added services and manufacturing related to the cargo. However, the first phase of development at the Dube TradePort (2010-2015), despite significant growth in air cargo, still faces challenges in terms of multimodal integration. Initial interviews suggest further investigations are necessary related to increasing local production and local services opportunities, increasing air connectivity

though route development and types of aircraft employed, as well as the longer term challenges of improved port and rail integration impacting are all impacting on connectivity.

2. The nature of integration between Dube TradePort, including the airport, with the Port of Durban, is not a direct or linear relationship. Relatively low volumes of goods currently move between the port and airport and only in the case of the cruise line industry, where there is potential for a more direct connection on the passenger side. The issue of integration is dependent on developing specific types of industrial and manufacturing opportunities in close proximity to the airport to provide flexibility and choice for distributing goods by either road, rail, sea or air capabilities. The nature of these land use opportunities would relate to high value, time sensitive goods where Durban holds both existing strength and future strategic growth opportunities, such as electronic and automotive components and pharmaceuticals.

3. Interviews on the prospects of Dube TradePort developing into a full multimodal logistics platform suggest the importance of a rail connection, with a secure land connection between the rail and the cargo terminal multimodal logistics platform. The motivation relates to industrial requirements for security and reliability between places of manufacture and distribution. While these capital intensive investments have not been committed, there is progress in terms of acquiring land and undertaking planning for the rail integration between adjacent off-site properties with a multimodal siding and the on-site TradeZone.

4. In terms of land use integration between the airport and logistics (including distribution, manufacturing and consumption) the expected shift to the airport has not yet occurred. While the airport specifically targets freight forwarders and logistics in the Dube TradeHouse, namely GT Services, Hazpak Trainaid, Kuehne & Nagel, Bidvest Panalpina Logistics, SA Red Cross Air Mercy Service (AMS), Menzies Aviation / Air Menzies, Interloc Freight Services, Air Chefs, Turners Shipping, GT Logistics, SDV South Africa, Rohlig-Grindrod Consolidation and Wholesale Cargo East Coast, Ocean View Marine Services (TradePort, 2014), the bulk of logistics support are still road and port centered. This suggests further investigations are required to fully appreciate why sub-optimal modal splits persist and how city logistics and long haul distributions relate.

5. Land use integration on the site between the Cargo Terminal and TradeZone 1 is designed into the development. However, although TradeZone 1 site is fully developed, the direct links between the firms and air cargo operations are still tenuous where the TradeZone production is not directly and currently tied to Cargo Terminal services. The second phase development may overcome some of these integration challenges through proposed screening criteria. Furthermore, the relative influence of the SEZ in attracting new development on Dube TradePort site and specifically the integration with cargo terminal is still underway and open to possibilities.

This research project is in the early phases of investigation to establish the role of airports in the distribution of goods and how airports integrate with places of production and consumption related to the movement of goods. It is concluded that while strong integration was designed into the development of the airport region as a multimodal logistics platform, the current trajectory is suboptimal. The study provides for a level of generalization for airport regions within the context of a case study, and highlights some of the challenges for how space is produced around an emerging airport region in the Global South.

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Happiness and high-rise living: sentiment analysis of geo-located Twitter data in Hong Kong's housing estates

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The high-rise housing, a largely unfavorable housing type in Western context (Turkington et al. 2004; Jacobs 1961), is considered a success in Asia (Castells et al. 1990). Researchers argue that a high-rise housing estate, if properly designed and managed, can be a satisfactory solution for high-density cities (Yeh 2000; Yuen et al. 2006); systematic evidence supportive of the above arguments are rare (Turkington et al. 2004). Questions remain as whether high-rise living promotes or degrades happiness? What are the physical attributes that are linked to occupant sentiment in high-rise housing estates? We used sentiment analysis of Twitter data as a measure of occupant satisfaction with the living environment. Data were collected between May and June 2016 within 487 major housing estates in Hong Kong, covering a variety of building forms, density, and other built environment attributes while controlling for demographic, social and economic profiles. Results show that the design of high-rise buildings matter: the Twin-Towers and T-shaped buildings, both were popular housing types in the 70s, correlated with negative sentiment tones. Density, measured in units/ha, showed positive correlation with happy sentiment. Property age, block size, loan-to-income ratio, employment, and occupation were also correlated with sentiment tones. Findings ave implication for urban planning and design.

1. INTRODUCTION

A high-rise building is defined as a structure taller than 5 level for Europeans (Turkington et al. 2004), 7 levels for Americans (NFPA 2015), or 30-50 stories for Asians. It was once considered a necessity to solve housing needs after the WWII and for rapidly industrializing cities. Le Corbusier's visionary "Ville Radieuse" (the Radiant City) pioneered the concept of high-rise housing blocks with lasting influences on urban planning practices worldwide (Curtis 1996). High-rise housing was largely viewed as unfavourable in Western context. Literature associated a life in high-rise buildings with various unpleasant outcomes (Gifford 2007). Jane Jacobs likened high-rise housing projects to the "corridors of a bad dream".(Jacobs 1961); Alexander believed high-rises makes people crazy thus buildings should not exceed 4 stories altogether (Alexander et al. 1977). In Europe, high-rise residential buildings are considered as "problematic living conditions, deprived areas, a poor population, a negative image, ... in short, they are not the most popular areas in town" (Helleman & Wassenberg 2004). They are associated high-rise living with fear (Newman, 1975), mental health difficulties (Fanning 1967), suicide (Marzuk et al. 1992; Lester 1994), behavioral problems (Ineichen & Hooper 1974; Robert Gifford 2006), poor social relations (Bickman et al. 1973; Holahan & Wilcox 1979; Arie Nadler Daniel Bar-Tal 1982), and hindered child development (Oda et al. 1989) anxiety, isolation and ill-health (Jephcott &

Figure 1 Ville Radieuse (the Radiant City) proposed by Le Corbusier Figure 2 High-rise housing estate in Tai Koo, Hong Kong

Robinson 1971; Conway & Adams 1977). Systematic studies with randomized control for socio-economic confounders, yielded similar findings that high-rise dwellers are less satisfied than those living in low-rise houses (Moore 1975; Canada Mortgage and Housing Corporation 1979; Saegert 1979; Franck 1983; Rohe 2009).

In contrast, Asian cities appeared immune to the high-rise-phobia elsewhere. Cities such as Hong Kong and Singapore championed high-rise housing program (Castells et al. 1990; ROONEY 2003), where living off the ground became the norm and the high-rise public housing programme was credited as a success (Yeung & Wong 2003). The majority of high-rise residents, concluded by a Singaporean survey, expressed satisfaction with their floor levels (Yuen et al. 2006). Asian immigrants seemed to have brought their home success to a few western cities, such as Vancouver, Melbourne or Toronto where a resurge in high-rise housing occurred in recent years. Researchers argued that the high-rise high-density urban environment, if properly designed and managed, can offer a viable solution to house the population in 'good' density (Yeh 2000).

What design attribute that made Asia's high-rise living viable remains, however, poorly understood. Existing studies, mostly relied on questionnaire data from a few housing estates, cannot explain conditions across the full spectrum of housing forms: high-rises, low-rises, or mid-rises. We don't understand the impact of urban morphometric such as building forms (slabs, towers, etc.), density, property age (Asian high-rise buildings maybe newer than Western counterparts), or amenities on occupant sentiment. Questions remain as whether high-rise living promotes or degrades happiness compared with alternative housing types? What are the physical attributes that are linked to pleasant living experiences? Earlier literature attributed failure of high-rise housing to bad design by architect and developer (Coleman 1985), yet evidence remained sparse (Turkington et al. 2004).

The rise of social media provides new opportunities to study the relationship between people and the built environment. User-generated contents, together with account profile, location, and mood can be readily available with internet access. Existing studies looked at the temporal pattern of mood using Twitter data at national scale (Durahim & Co□kun 2015) or analytics of epidemic diseases (Nagar et al. 2014). Little has been done using geo-coded social media data to study the built environment. Correlations between mood and built environment characteristics were found. Strong sentiments were found near parks, transport hubs, and polluted areas in New York, according to a recent study (Bertrand et al. 2013). Social media data allow us to avoid uncertainties from survey and self-reported data.

We conducted a cross-sectional study using 487 major housing estates in Hong Kong. Our sample covers a full spectrum of housing forms, from super high-rise to single family homes. We used the sentiment tones of geo-coded Twitter data as a proxy for residents' happiness and satisfaction. The purpose is to identify the correlation between sentiment and physical attributes i.e. building forms, amenities, controlling for density, access, location, and demographic variables such as income, age, education, etc.

Re-examining high-rise living has practical significance today. Compactness and high-density are viewed as a planning therapy to make cities richer, healthier, happier (Glaeser 2012). Skyscrapers are believed to have fostered social capital and creativity (Glaeser 2011).

Jacobian economists consider high-density cities to be more innovative due to agglomeration externalities and knowledge spill-over (Jacobs 1969). Others view high-density cities as a necessity in light of growth pressure from urbanization, land and resource constraints (Dantzig & Saaty 1973; Jenks et al. 2004) while urban sprawl, the low-density suburbs on the opposite end of the density spectrum is viewed in unfavourable light (Montgomery 2013; Katz 1993). High-rise housing is a necessary ingredient in every high-density city recipe. Knowing the precise dosage and ingredient make-up for 'good density', therefore, is of importance to urban planners and design practitioners.

2. METHODS

2.1 Study Subjects

We compiled a sample of 487 major housing estates in Hong Kong, a 50-50 split between private and public ownership. A major housing estate is by definition that accommodate either 1) over 3,000 residents or 2) 1,000 households according to the 2011 census data (Department of Census and Statistics 2012). Each is a gated community by itself, some even included playground, grocery stores, markets, kindergarten, or schools. The sample cover all 18 districts of Hong Kong (Figure 3Figure 5) and is representative of the territory. Built within six decades, the sample vary considerably in physical attributes such as building forms, density (unit/ha),

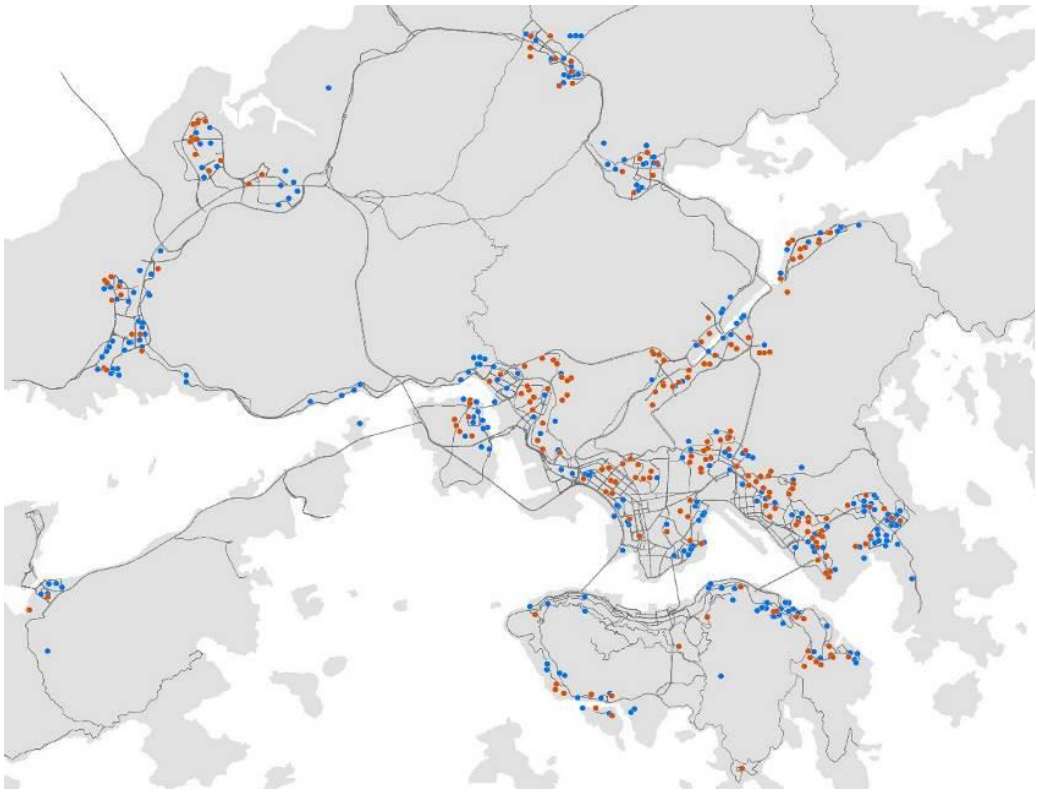

Figure 3 Location of major housing estates in Hong Kong. Public housing estates are colored in red while private ones in blue.

topography, street patterns, access to public transit, and nearby open spaces (Table 1).

2.2 Data & Source

We used a combination of 2016 Twitter data, 2011 census data, and GIS database. We used streaming APIs, a digital tool allowing access to the live stream of Tweet data. Sentiment analysis are performed using the Linguistic Inquiry and Word Count (LIWC), a lexicon-based linguistic analysis tool which reads a given text and counts the percentage of words that reflect different emotions, thinking styles, social concerns, and even parts of speech. The output is the measure of "Emotional tone" from 100 to 0, where 100 stands for positive, upbeat style; while 0 as anxiety, sadness, or hostility. The value of 50 suggests either a lack of emotionality or ambivalence. The tool has been validated in previous studies on verbal expression of emotion (Tausczik & Pennebaker 2010; Kahn et al. 2007).

Figure 4. Average Twitter Emotional Tone in Hong Kong by Tertiary Planning Units. Tweets collected from May 1 to June 30, 2016.

Figure 5. Housing types in Hong Kong included in the study sample. Source: Hong Kong Housing Authority

A limitation to the current method is that we are currently 1) unable to process non-English tweets; 2) over-sampling younger population who tend to be more active in social media; also, there might be a representative gap between the active Twitter user group and the population in Hong Kong. However, we consider the sentiment analysis of social media a valuable supplement to the traditional method of questionnaire with various uncertainties of its own.

GIS database layers such as road network, open spaces, public transit, and topography were obtained from OpenStreetMap (OSMF 2016). We measure the number of road intersections within 200 meters off the housing estate boundary, a popular index for block size and road network density. We also recorded distance to the nearest transit station (MTR) and open spaces maintained by the government. Topographical slope was measured in unit of degree. The geographic boundary of the 487 major housing estates are derived from CentaMap, a comprehensive digital map service for real estate properties (CentaMap Company Limited 2016). CentaMap also provides data on amenities within the housing estates, such as swimming pools, playground, grocery stores, wet market, kindergarten, and schools. Google satellite imagery are used to detect building types such as the Twin-Tower, the T-shaped, Y-shaped, Cruciform, slabs, etc. (Figure 5, Figure 7).

Socio-demographic information for the 487 major housing estates are available at aggregate level via the Census and Statistics Department of the Hong Kong Government (Department of Census and Statistics 2012). The database consists of both individuals (headcount, education level, age, gender, ethnicity, language use, marital conditions, and occupation) and households (household size, median income, rents, mortgage payment, home ownership). The census data also included the total number of units, whether it is private or public, the maximum and minimum size of housing unit, and property age.

3. RESULTS & DISCUSSION

A total of 129,269 tweets were recorded in Hong Kong dated between May 1 and June 30, 2016, each consists of text, time stamp, and basic account profile. 45,824 are in English language, 28,175 tweets contained GPS coordinates, and 4,563, or 3.5% of the total can be identified within the boundary of the 487 housing estates. Table 1 summarizes built environment attributes for the sample including density, estate age, unit size, nearby street intersections, topography, distance to MTR stations, open spaces. Table 2 summarizes the demographic, social and economic attributes aggregated from the 2011 census database.

Table 3 summerizes the results from the multi-variate regression model, where the left-hand (dependent) variable is the average emotional tone measured from tweets inside a housing estate. The right-hand varialbles are attributes of the built enviornment as well as demogrpahic, socio-economic ones as control variables. Major findings are below:

First, the design of buildings matter. The Twin-Tower, a popular public housing type in the 70s designed to facilitate eye-contact between households and to reduce crime (Yeung & Wong 2003), correlated with negative emotional tones ($p<0.05$). Twin-Towers estates measured nearly 8 units lower in emtional tones compared with alternative building forms. Similarly, the T-shaped tower estates measured 19 units lower ($p<0.1$). Housing estates with playground

Variables	*Emotional Tone*	*Density*	*Property Age*	*Distance to MTR station*	*Distance to open space*	*Max. unit size*	*# of street Intersections (within 200m)*	*Topo-graphical slope*
Unit	*0-100*	*Housing unit/ha*	*year*	*meter*	*meter*	*Square foot*	*count*	*degree*
Mean	*54.9*	*673.3*	*24.4*	*85.5*	*73.2*	*721.7*	*11.0*	*5.5*
Max.	*99.0*	*5861.3*	*54.0*	*1562.4*	*1472.7*	*5530.0*	*66.0*	*18.0*
Min.	*1.0*	*14.3*	*5.0*	*0.0*	*0.0*	*253.0*	*0.0*	*2.0*
St. Dev.	*29.0*	*465.8*	*9.7*	*159.4*	*145.5*	*459.3*	*11.4*	*3.3*

Table 1. Summary of built environment attributes for 487 housing estates included in the sample

Variables	*Gender (male=1)*	*% under 25*	*% Chinese*	*% College Degree*	*% English Speaker*	*% Married*	*Loan/ Income Ratio*	*Median household income*	*% Employed*	*% Employer*
Unit	*binary*	*0-100*	*0-100*	*0-100*	*0-100*	*0-100*	*0-100*	*HK$/month*	*0-100*	*0-100*
Mean	*46.7*	*24.0*	*95.1*	*19.7*	*2.5*	*51.7*	*12.8*	*26,866*	*46.2*	*5.1*
Max.	*53.1*	*44.9*	*100.0*	*43.1*	*54.1*	*65.1*	*31.1*	*157,000*	*64.6*	*16.2*
Min.	*38.8*	*11.5*	*50.0*	*1.8*	*0.0*	*34.2*	*0.0*	*6,500*	*28.4*	*0.9*
St. Dev.	*2.3*	*5.3*	*5.9*	*10.3*	*5.0*	*5.5*	*9.6*	*18,414*	*6.0*	*2.5*

Table 2. Summary of demographic, social and economic attributes for 487 housing estates

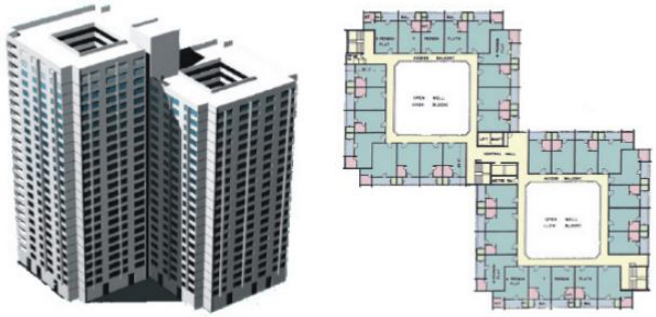

Figure 6. Typical floor plan of a Twin-Tower; Source: Hong Kong Housing Authority

facilities are happier by 22 units than those without ($p<0.1$), while those with swimming pools are 30 lower ($p<0.05$).

The denser a housing estate is the merrier: each increment of one unit per ha is associated with 0.02 unit increase of emotional scores ($p<0.05$) -- we remain cautious not to over interpret the happiness-density correlation with a small sample. We did not find significant correlation between emtional tone and the distance to MTR station or nearby open spaces, nor is the number of road intersections matter in the model results. Private housing estates appeared happier than public ones, measuring 38 scores higher on average ($P<0.05$). The age of housing estates, the number of years since inauguration, negatively correlated with emotional tome ($p<0.05$). The above results remained significant after controllong for demographic, social and economic attributes.

Emotional tones were negatively correlated with the percentage of college-educated residents ($p<0.1$); an increase of 1% with college degrees correlated with 2 units decrease in sentiment tones ($p<0.05$). Correlations with age group, ethniciy, language use and marriage were insignificant in our model. Of the economic attributes, happiness negatively correlated with the median loan payment/income ratio ($p<0.01$), not household income. 1% increase in loan payment to income ratio decrease the happiness score by 2 units. The percentage of residents in workforce, those either employed or self-employed, correlated strongly with positive mood; 1% increase in workforce population was associated with 4 unit increase in emotional tone ($p<0.01$).The percentage of people working in certain occupational sectors, such as finance, government, trade, transport and information, correlated negatively with happiness.

Figure 7. A Twin-Tower Building, Oi Man Estate, Ho Man Tin. Source: Peter Steward

Table 3. Regressing 'average emotional tone' on built environment, demographic, and socio-economic attributes

Number of obs	*119*
F(27, 91)	*1.78*
Prob > F	*0.02*
R-squared	*0.36*
Root MSE	*26.62*
***Average Emotional Tone** (happy=100, neutral=50, unhappy=0)*	*Coef. (p-value)*
Built Environment Attributes	
Twin-tower buildings (yes=1)	*-7.55 (0.019**)*
T-shaped buildings (yes=1)	*-19.01 (0.076*)*
Y-shaped buildings (yes=1)	*8.06 (0.329)*
Unit density (100 unit/ha)	*0.02 (0.029**)*
Private housing (private=1, public=0)	*37.94 (0.017**)*
Age (year since built)	*-0.92 (0.012**)*
Swimming Pool (yes=1)	*-28.98 (0.036**)*
Playground (yes=1)	*16.93 (0.232)*
Distance to nearest MTR station (m)	*0.00 (0.89)*
Distance to nearest open space (m)	*0.01 (0.622)*
Maximum unit area (1,000 sqft)	*0.00 (0.568)*
# of street Intersections (within 200m)	*-0.32 (0.24)*
Topographical slope (degree)	*0.94 (0.343)*
Socio-demographic Attributes	
% of ppl. with college degree	*-2.37 (0.028**)*
% of youth (under 25)	*-1.64 (0.122)*
% of ethnically Chinese	*0.44 (0.74)*
% of English speaker	*0.90 (0.507)*
% of ppl. Married	*-0.49 (0.636)*
Economic-Occupational Attributes	
Median loan payment/income ratio	*-1.74 (0.023**)*
Median household income (1,000HK$/month)	*-0.26 (0.483)*
% of ppl.in workforce	*3.89 (0.007***)*
% of ppl. in finance sector	*-7.42 (0.002***)*
% of ppl. as public official	*-3.89 (0.056*)*
% of ppl. In elementary sector	*-2.53 (0.222)*
% of ppl. In agriculture & fishery	*-55.61 (0.202)*
% of ppl. In trade	*-4.15 (0.021**)*
% of ppl. In transport	*-6.00 (0.005***)*
% of ppl. In information	*-11.89 (0.015**)*
Intercept	*123.69 (0.376)*

** 90% significance level, ** 95% significance level, *** 99% significance level*

4. CONCLUSION

We conducted a pilot study on social media sentiment in Hong Kong's housing estates to identify the correlation between happiness and built environment attributes. The novelty of this study is the use of geo-coded social media data as a proxy to measure sentiment, allowing us to detect and compare intra-city variations as a result of built environment attributes. The following findings are of interests to urban planners and design practitioners.

- Building types such as the Twin-Towers and T-shaped buildings are found to be negatively associated with happiness.
- Tweets in private housing estates appeared happier than public ones;
- Occupants in old housing estates were less happy than those in new ones.

- Density is positively correlated with sentiment tones; although this should not be over interpreted as causality.

Limitations & Next Steps

- The number of geo-coded tweets are limited with a two-month period. The number of tweets fell within the footprint of the 487 housing estates are relatively small (10 tweets per estate on average). This shortcoming will be improve in future as our data-collection continues.

- Sentiment analysis for Chinese and other languages were not included in this paper; multi-language parsing tools are needed in the next stage studies.

- This is only a cross-sectional study without control of past sentiment and built environment attributes. Further study will look into the historical dataset and adopt the quasi-experiment research design.

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URBIS decision support for integrated urban governance

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The challenges for the management of cities and city-regions in addressing the economic and societal dynamics facing Europe and Europe's cities today is evident in the complexity and interconnectedness of the global and pan-European drivers of change and their associated socio-economic, environmental and territorial impacts for urban environments. Integrated urban management processes emphasising horizontal integration across the sectoral agencies at the local level, and vertical integration between government agencies from city to EU level is identified as critical to the management of the city-region in relation to the key political objectives defined at both local and EU levels.

The clear need for enhanced intelligence to support inter-agency collaboration and decision-making on territorial development as a central feature of integrated management is identified as a prime opportunity for URBIS solutions. Accordingly this paper presents an overview of the EU funded URBIS project (ICT PSP 2014–17) investigation of vacant land potential in urban areas, and the opportunities for previously developed land or brownfield to support urban regeneration safeguarding greenfield sites. URBIS delivers assessment methodologies and tools to provide accurate up-to-date intelligence on urban vacant land opportunities that is comparable across European cities to support the definition and implementation of sustainable planning and governance strategies in cities and city-regions throughout Europe.

The background to this innovative research and city pilot development are growing pan-European concerns with land taken for urban use, which annually converts almost 1000 km2 of agricultural or natural land into artificial areas, as part of a wider European land degradation process. This land take process is driven by urban sprawl and infrastructure development, for example when new urban industrial or commercial areas are built on highly fertile agricultural land, rather than recycling abandoned or underused artificial sites. Land use efficiency is today a prime political objective at both European as well as city level, and the EU Land Communication aims to establish "zero net land take" across the EU by 2050. Central to the delivery of this policy is accurate intelligence on the availability and supply of previously developed "brownfield" land, as a key component of land-use decision making, maximising the net socio-economic benefits from land-use without degrading natural capital.

The core objectives of URBIS presented in this paper aims to deliver this intelligence via urban planning decision support tools methodologies and assessments to realise the development potential of vacant and underused land in urban areas.

1. URBAN SPRAWL IN EUROPE

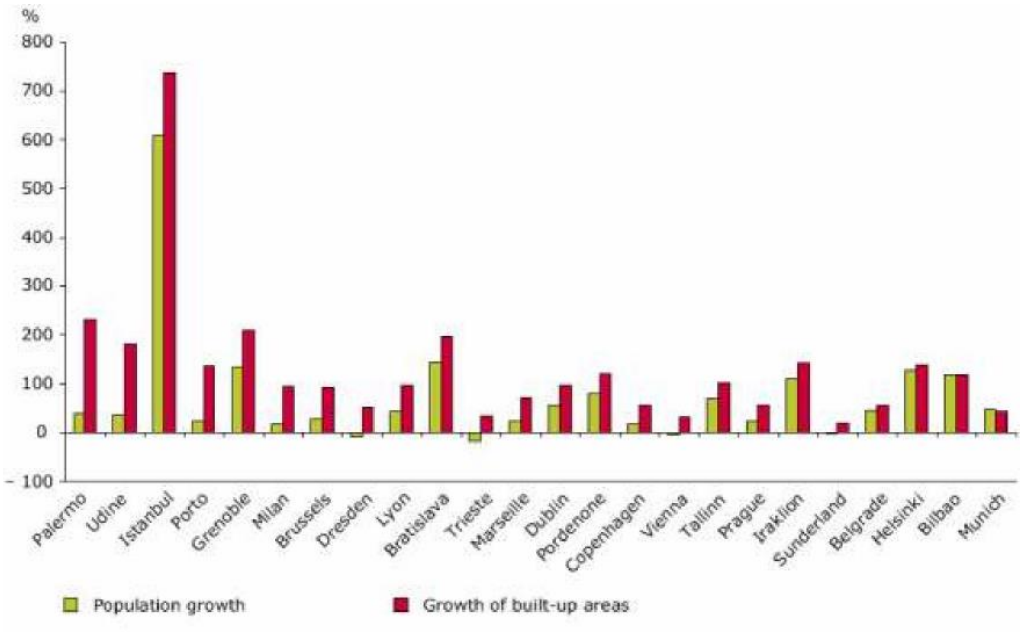
European urban and regional planning on all levels is increasingly being challenged by economic globalisation and this will continue to intensify over the coming decades. Traditional European cities have developed into regional agglomerations, but planning methods and the associated management tools have not progressed and these are still applied within a "traditional" model of land use planning and non-integrated environmental management. In addition, poorly integrated and unsystematic approaches in land use policies with limited linkage to environmental quality will further impact on the environmental problems seen in many European cites. It could also be claimed that this may increase land-related conflicts in densely urbanised regions and in turn seriously threaten the social function and competitiveness of all European cities and regions, including those in the new Member States.

Moreover the current financial and economic crisis has the potential to enlarge land related problems due to the reluctance of financial institutions to take higher risks for projects in the existing urban context.

The never ending extension of built-up areas and migration of the population from rural to urban areas across Europe has been recognised as a long term trend as most of the economic activities are concentrated around major urban areas. A more recent trend is the migration of population and some economic activities from city centres to the urban fringe and neighbouring rural areas encroaching onto "greenfield" land, i.e. land that has not previously been developed. This phenomenon is referred to as urban sprawl and has been recognised as one of the most significant land use changes in the last two decades across Europe (EEA 2006). Urban sprawl is accompanied by the conversion of land to artificial surfaces resulting in soil sealing, thus further increasing the environmental consequences of urban sprawl. Indeed over this period, the extent of built-up areas in many western and eastern European countries has increased by 20 % while the population has increased by only 6 % (cf. Figure 1). Even in shrinking regions, the consumption of land remains on a high level. This poses a very serious threat to the existing nature of European landscapes with significant environmental problems linked to increasing transport distances and volume of traffic, and the increasing use of private modes of transport exacerbating greenhouse gas emissions and climate change. Moreover, these trends endanger the achievement of European environmental goals in areas such as biodiversity protection and water management and also hinder the effectiveness of instruments in these areas, including the Natura 2000 network and the Water Framework Directive.

The land and property market across Europe is a multi-billion Euro business. It is difficult to separate the land market from the overall real estate market, but a recent study undertaken by the EPF NPdC (Etablissement Public Foncier Nord Pas-de-Calais, France) shows that in the Nord Pas de Calais region alone, the land property market amounted to 850 million Euros between 2000 and 2002, a 6% increase on the previous period 1997-99. The annual average land area developed represented around 1,000 ha. However, vacant land represents less than 1% of the total of land developed, despite an estimated 1,800 ha of vacant land available for redevelopment in 2006. Moreover, in another report linking urban sprawl and recycling of land, EPF NPdC estimated that if all 1,800 ha of vacant land located within the urban area was recycled it would save an equivalent of 8000ha of mostly agricultural land in the periphery of urban areas. This is possible because vacant land is already close to transport and utilities infrastructure, and so not requiring the construction of new infrastructure.

Unbalanced and uncontrolled development puts high risks on competing market led developments in the redevelopment of urban land and brownfield projects, and could lead to market failure as illustrated in several American cities (e.g. Detroit). These risks are also highlighted in a report by the RICS Foundation (RICS 2012) on the development



Source: MOLAND (JRC) and Kasanko *et al.*, 2006.

Figure 1. Population growth and the growth of built-up areas (mid-1950s to late 1990s), for selected European cities

of land and property markets in central and Eastern Europe where the Czech Republic and Poland are respectively ranked second and third in a combined growth and stability/risk indicator in the region. However, the authors of the report stress the importance of reliable market data and transparency.

At the same time, a significant proportion of artificial areas is not actively used and could potentially be redeveloped instead of encroaching on non-urbanised land. In this context, vacant sites are defined as previously developed land or derelict and vacant land and building sites. This includes any form of development, e.g. former housing estates as well as disused industrial or military sites as well as disused social or technical infrastructures. The term "vacant sites" is preferred to brownfields which are often associated with previous industrial or commercial sites that are potentially contaminated. In some cases, vacant sites can also include agricultural or natural areas surrounded by urban areas. Vacant sites are a natural reservoir of land that can potentially be redeveloped.

One important key to unlocking the vacant site potential is the provision of accurate and up to date land cover/use information. The implementation, validation and wide European adoption of specific inventory, typology and decision support services for vacant lands provide the basis for a system aiming at mitigating urban sprawl. URBIS services enable consideration of the land reuse strategies in the context of ecosystem services whereby the supporting, regulation, provisioning and ecosystem services provided by the vacant sites could be identified to inform future planning policy and decisions to foster a more holistic planning approach critical to sustainable urban development.

The concept of URBIS services is presented in Figure 2 below and is conceptually linked with the circular flow land use management ("Fläche im Kreis", 2005). Circular flow land use management aims to provide an integrated political and governance approach which includes the whole spectrum of policy areas and fields of activity. It is developed in relation to both local and regional levels and combines planning considerations at both levels in an integrated urban and regional land development policy. The cycle relies on the interplay between strategies and instruments in different fields of activity, and on a suitably comprehensive deployment of tools (instrument mix) in these areas, which includes, land information (the key-focus of URBIS), planning cooperation, organisation and management, investment and support programmes, marketing and legislation.

2. ROLE OF COPERNICUS LAND MONITORING CORE SERVICES (LMCS)

Vacant urban land can present very different characteristics depending on the level of development and previous use of the land. As a result, depending on size, location and previous use, vacant land may be redeveloped with minimum inputs (for example development of a green park from land with no previous use) or at the other extreme require substantial remediation work (for example development of a housing estate on potentially contaminated land). However, lack of knowledge about site conditions and characteristics typically hampers redevelopment, whatever its readiness for redevelopment. Although information exists locally, it is often patchy, incomplete and distributed between different organisations. Moreover, there is a lack of consistent information at the European level making it difficult to exchange and compare data. However, opportunities exist to overcome these

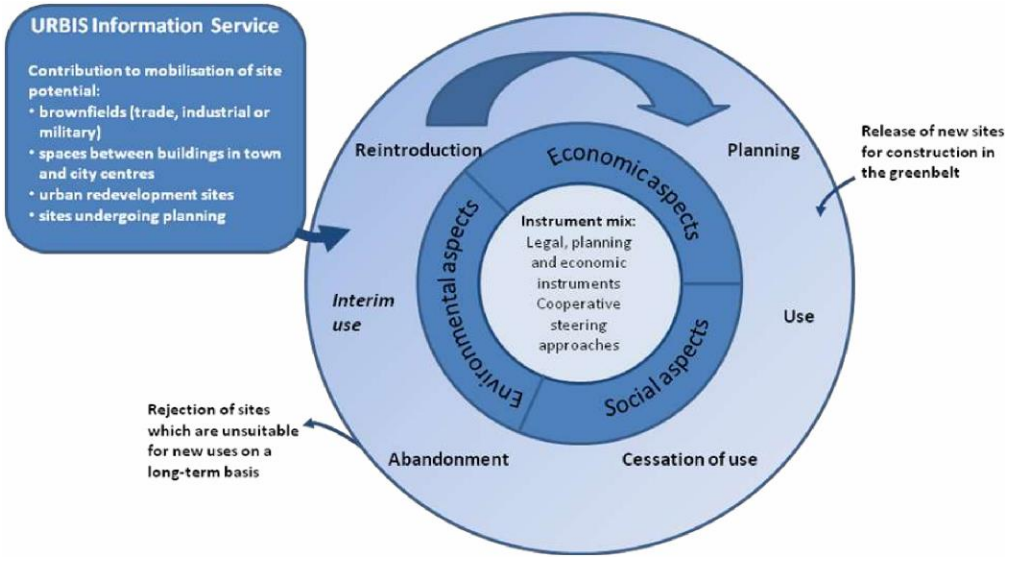
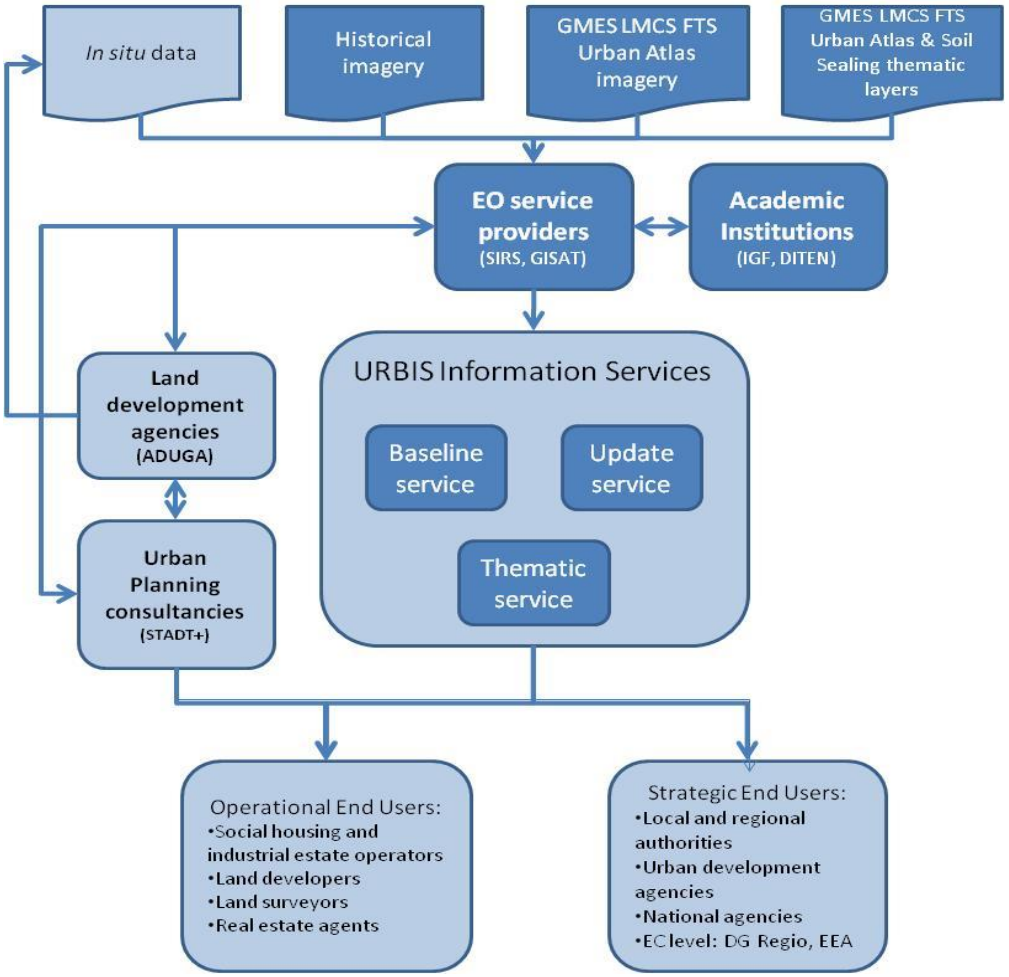


Figure 2. Role of URBIS in the circular flow land use management concept (after "Fläche im Kreis", 2005)

Figure 3. URBIS service architecture



constraints via the development of a methodology to develop a European information service on vacant land with the deployment of Copernicus LMCS. In particular, the Fast Track Services (FTS) on Land Monitoring developed by a number of EU research projects including geoland (1 and 2), and the follow-up GIO Land pan-European and local components (Urban Atlas 2012, High Resolution layers) introduce new more detailed layers of information focused on urban areas essential for the development of an information service aimed at identifying and characterising vacant and derelict urban sites. The development of such an information service will play a major role in the promotion of the recycling of existing urban sites, thereby directly addressing the reduction of urban sprawl.

Such an information service currently does not exist or is incomplete. In addition, the various initiatives that exist are locally based and lack a common methodology making it difficult to exchange and compare data. The availability of Copernicus LMCS open data makes it possible to develop new EO services for urban planning. In particular, availability of the GIO Land five High Resolution layers (Imperviousness degree for 2006, 2009 and 2012, tree density, grassland, water bodies and wetlands for 2012) and the Urban Atlas (2006 and 2012) combined with outputs from geoland2 regional and local Core Mapping Services (CMS) and Spatial Planning Core Information Services (CIS) concerning spatial planning provide realistic data to explore and build such a service. The Urban Atlas in particular with its characterisation of "land without current use" facilitates the development of the URBIS proposed vacant land inventory and typology information service. Furthermore, EO data acquired for LMCS services can be easily re-used to tailor the proposed URBIS service to the specific thematic needs of the users. Without it, the development of such a service would be very costly and time consuming, and the level of sustainability on the data supply side would be questionable.

The Urban Atlas and other core services are primarily for use at European level, but URBIS is also focused on providing an information service relevant at the local level. In addition, other land cover/use data sources can be used as a basis for URBIS should they be available from user organisations.

3. OPEN DATA AND GIS

URBIS services will be built upon various sources of open geographical information data from local, regional, national and European level. According to the a recent communication paper from the European Commission (Com 2011) the market size and growth of the geographic information sector shows the potential of public data as an engine for job creation. The German market for geo-information in 2007 was estimated at 1.4 billion euro, a 50 % increase since 2003. In the Netherlands, the geo-sector accounted for 15 000 full time employees in 2008.

Recently, a number of initiatives have made it possible to open up the access to geographical information. At institutional level, these initiatives are encouraged globally notably through the GEO. The aim of GEO is to build a GEOSS whereby the duplication of data and initiatives is minimised through the development of a system of systems. In Europe, the GEO initiative is supported through Copernicus and INSPIRE. INSPIRE fosters interoperability between information services whilst Copernicus provides core information services on which to build value added services. The fact that most of the Copernicus core services adopt an open data policy facilitates the development of downstream services.

Crowd sourcing initiatives such as Open Street Map will also contribute to the development of URBIS services. Worth noting is that Copernicus core services were initially integrated in Open Street Map for areas where precise field observations were lacking such as in some Eastern European countries.

4. URBIS OBJECTIVES, SERVICES, USERS

4.1 Objectives

The URBIS project aims to develop, implement and validate in real environment innovative information services related to urban vacant land, based on open geospatial data, to support planning of European Large Urban Zone's (LUZs) in a sustainable way.

The specific objectives of the project are:

- Objective 1: To assess the potential reuse strategies of vacant urban land based on its past uses and characteristics and through wide involvement of end-user organisations, to establish common ground for the development of URBIS services.
- Objective 2: To develop a methodology for an inventory and typology of European vacant urban land based on Copernicus LMCS FTS Urban Atlas and soil sealing layers and the analysis of multi-temporal imagery to determine potential constraints to redevelopment.
- Objective 3: To develop, implement and validate interoperable services on a number of representative LUZs across Europe under operational conditions in collaboration with key European stakeholders/practitioners.
- Objective 4: To develop a sustainable operational and business model for the URBIS information services
- The proposed service architecture is illustrated in Figure 3 below and shows the main sources of data for the planned URBIS services and linkages between EO based service providers, land development agencies, land use planning consultancies and end user organisations.
- URBIS will rely primarily on the Copernicus LMCS FTS Urban Atlas, soil sealing layers and their associated source image data. In particular, the 'Land without current use' category of the Urban Atlas will be further investigated in combination with historical imagery to determine past use. In situ data when available will be sourced from land development agency partners and stakeholders and used to provide local knowledge and contribute to the development of a validation data set.

4.2 URBIS services

The project will develop and implement three main categories of URBIS services:

1. Baseline services: initial inventory and typology of urban land, not only to identify sites that can be used for re-development, but also to identify sites that should be preserved and not used for further development (e.g. high ecological value). The inventory will be based on data from the Urban Atlas.
2. Update services: an update service, with the regular update of the vacant urban land inventory synchronized with the planned Urban Atlas updates.

3. Thematic services: a set of added-value services tailored to end-users (local authorities, policy makers).

1. Baseline services

This service will be in line with the Urban Atlas reference year 2006 and will include the analysis of historical imagery for at least 3 reference years in the last 30 years (e.g. 1975, 1985 and 1995). The 2006 URBIS vacant site inventory product will be based on the analysis of the Urban Atlas vector layer combined with the original Urban Atlas imagery and historical imagery. It should be stressed that the purpose of the inventory and typology of vacant sites is not just to identify sites that can be used for redevelopment, but also to identify sites that should be preserved and not used for further development (e.g. high ecological value).

This will be achieved in two steps:

First, by reducing the Minimum Mapping Unit of the 2006 Urban Atlas vector layer for all the potential vacant urban sites to include non-built and derelict building parcels. This will focus on the following Urban Atlas Classes:

- Green areas greater than 500m2 included within classes 12210, 12220 and 12230 (associated land with roads and railways)
- Mineral extraction and dump sites (class 13100)
- Land without current use (class 13400)
- Green urban areas (class 14100)
- Sports and leisure facilities (class 14200)
- Agricultural (class 20000), Forest (class 30000) and Water (class 50000) features adjacent to artificial areas

Secondly, a change detection analysis based on the historical imagery. The output of this process will be twofold:

- It will result in a series of enhanced (500m2 Minimum Mapping Unit for the classes listed above instead of 2500m2 for the original Urban Atlas vector layer) historical Urban Atlas layers
- This information will be used to characterize potential vacant sites using the following attributes (table 1.1)

Besides the land-use and land-cover results already available in the Urban Atlas, state-of-the-art processing techniques for land-cover classification and multi-temporal analysis will be applied to the related source satellite data to optimize the classification accuracy especially in the case of very-high spatial resolutions.

2. Update services

During the course of the project it is envisaged that an update product based on the same characteristics as the baseline product for the reference year 2013 (+/- 1 year) will be provided.

3. Thematic services

URBIS baseline and update products will be used to derive a series of thematic services. The type and detailed characteristics of these thematic services will be defined and developed in collaboration with end user organizations, but are likely to include the following:

- Potential sites for development: housing, shopping centres, industry
- Establishment of green corridors
- Development of potential sites for renewable energy production

The definition and content of thematic services will be enriched based on the implementation of the pilot studies foreseen in during project, when the baseline and update services will be developed. However, a set of specific added value services, targeting private sectors, is already envisaged to be tested during the project:

- Support the establishment of new business activities: logistic platforms, tertiary and commercial activities areas;
- Allow sites identification for housing construction;
- Allow sites identification to assist shrinking cities strategies (demolition/ Interim Use concepts);
- Inventory of sites with conversion potential into green spaces;

- Identification of sites for requalification into natural environment (protection of species, blue and green corridor).

One main activity of the URBIS project is the implementation, test and validation of the above mentioned services in real environment within 3 already selected Large Urban Zone (LUZ), geographically coherent with regards to partner's location, and which encompass a various set of specific criteria's and requirements in the field of vacant land reuse.

The 3 selected LUZs which will participate to the pilot studies are:

- Greater Amiens (France)
- City of Osnabruck (Germany)
- Moravian-Silesian Region (Czech Republic)

4.3. Users of URBIS services

The first priority users of URBIS services are local and regional planners. In more general terms, end users in the URBIS context can be separated in terms of operational and strategic users.

- Strategic users: such as local and regional authorities, European and national agencies in charge of urban planning, would directly benefit from URBIS services as for the monitoring of the implementation of particular territory planning policy (e.g. the 30 ha goal on reduced land consumption in Germany). Furthermore, URBIS services may be used to support the allocation, monitoring and evaluation of ERDF funds in urban areas, or to assess to which extent urban development is meeting targets for the redevelopment of vacant sites.

- Operational users: such as industrial estates operators or private land developers are likely to require the URBIS services for meeting the requirements of a specific need such as a to know where suitable vacant sites are located within metropolitan areas greater than a certain size for the construction of supermarkets, or a local authority in charge of social housing looking for suitable sites for the construction of a new project. Financial institutions might be interested in general land data to improve project business plans. Sites from developers are also required to place renewable energy production. Regional and local planners also need information on the different vacant land development options as a critical component of urban and regional planning in relation to the management of urban sprawl, and more generally in relation to the creation of green belts, nature conservation and leisure areas and their connectivity .

URBIS will contribute to the development of a new market for EO derived information (vacant land inventory and typology) led by EO service providers, SME's based on Copernicus products (LMCS FTS Urban Atlas and Soil Sealing layers) and addressing the needs of various stakeholders involved in land development at an operational and strategic levels.

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Digitisation and participation

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The Dutch government is preparing an unprecedented and comprehensive reform of all legislation concerning the physical environment, resulting in a new Environment and Planning Act. Its implementation is supported by a new digital system, which contains massive amounts of data but is not designed to enhance the involvement of communities in the planning process. This could be done by intensifying the application of 3D city modelling, augmented reality, virtual reality and the use of social media.

Two of the major challenges of the Environment and Planning Act are to increase the involvement of citizens in local planning practice, also known as participatory or collaborative planning (Fagence, 1977), and to stimulate private planning initiatives. So far, the results of interactive decision-making processes in the Netherlands have not been very promising (Boonstra and Boelens, 2011). An important precondition for such planning empowerment is not just the availability of sufficient and validated data, but also the way in which information derived from those data is visually presented. To involve more, and especially younger, people in planning policy and initiatives, we need to make more and smarter use of modern 3D visualisation techniques and social media. First, this paper addresses the characteristics of the new Environment and Planning Act, the features of the new digital system and how it supports professionals in the planning process. Second, it elaborates methods of 3D visualisation and social media strategies that could support non-professionals engaging in the planning process, concluding with some remarks concerning further research and experiments in our Saxion LivingLab.

1. ENVIRONMENT AND PLANNING ACT

1.1 A comprehensive legislative operation

In the 1960s and 1970s, the Netherlands, in an effort to improve the quality of the physical environment, rapidly introduced a system of sectoral laws. More or less independent legislation was established on spatial planning, construction works, water, air, noise, soil and other environmental compartments, with each of these laws having its own set of standards. Initially, the procedures to request administrative permissions were arranged by law, too, but in the 1990s and in 2010, a harmonisation was introduced in stages (Environmental Permitting (General Provisions) Act). This procedural harmonisation, however, is far from complete. According to the government, the current legislation no longer ties in properly with the current and future developments.[1] The timely involvement of stakeholders in the decision-making process on projects, for instance, is not adequately ensured and the accumulation of legislation makes the current system far from transparent for citizens. Naturally, it is important that legislation provides certainty, but it may also stifle planning initiatives by citizens and entrepreneurs. Calculation models and scientific evidence are often applied too rigidly. The (digital) provision of information also differs between the various laws. This discourages participation in the planning process.

The Environment and Planning Act has been announced by the Dutch press as the largest legislation operation since World War II. The new system is based on a shift in the paradigm: from 'No, unless' to 'Yes, provided that' in response to planning initiatives that will improve the physical environment as a whole. This creates room for development.

In time, it will replace some 26 sectoral laws. An estimated 50,000 analogue zoning ordinances will be turned into approximately 400 digital environment plans. The Environment and Planning Act has already passed both Houses of Parliament and will be implemented as from January 2019. The Environment and Planning Act has yet to be elaborated in technical regulations. At the same time, all corresponding planning data and IT systems will be integrated and modernised. In fact, the entire planning process will be digitised over a period of 4 – 8 years.

The Environment and Planning Act's methodology follows the directives of the European Union (EU), in which a central policy cycle is aimed at the active realisation of specific targets for the physical

environment, according to the government. This requires clear framework conditions in which citizens, businesses and the government can develop activities. The Environment and Planning Act offers a unified system of instruments to ensure those activities keep on the right track.

Important objectives of the Environment and Planning Act are:

to offer scope to consider planning initiatives from society

to stimulate and safeguard participation in the planning process.

1.2 Changing society

Society is changing: increased individualisation, greater access to information and, in particular, the emergence of social media. Citizens are increasingly less likely to be represented in fixed groups, but form varying networks to deal with a single theme. Partly as a result of the democratisation of knowledge, the authority of social institutions – including the government – can no longer be taken for granted. Society's needs are changing as well: work is less restricted to a particular area, mobility is on the increase, knowledge and points of view are rapidly shared, but the depth of the shared information is decreasing.

The current environmental legislation does not correspond sufficiently to the developments in society. Municipalities, for instance, feel that the current research obligations and legal precedents force them to make detailed zoning plans, while society demands fast and flexible government action. Large projects may currently take dozens of permits.

The current legislation arranges citizens' participation and involvement in projects in a different way, and considers active involvement, preferably at an early stage, most desirable, in particular in case of complex projects. The Environment and Planning Act obliges the government to take the interests of all involved parties into account in its decision-making process. Additionally, the government is accountable for its actions. The Minister may impose rules on early involvement and stated the following during the discussion in Parliament: 'Administrative bodies will have to justify the input yielded by the early involvement and the manner it was weighted in its substantiation of the draft decision, which will allow interested parties to examine what was done with their contribution.'[2]

2. ENVIRONMENT AND PLANNING ACT: THE DIGITAL SYSTEM

2.1 The digital system to support the Environment and Planning Act

The communication between public authorities and citizens is increasingly digitised. During the next few years, this trend is set to continue in environmental law and in planning practice. This is in line with the further digitisation of society.[3]

Digitisation of the Environment and Planning Act focuses on both the provision of information (the availability of the right information at the right time) and the procedural support. To ensure an effective improvement of the digital information provision, a transparent system is required that is clear in terms of its methodology, language, control and data management. The digital system is not an isolated set of rules, but part of the existing e-government services, the generic data infrastructure, the internal government processes and the legal system.

The preliminary design of the digital system comprises of (1) a single portal connected to user applications that offer standardised information required by citizens, businesses and authorities for applications for building permits and notifications, (2) a central information infrastructure, to which clear agreements and digital standards apply and (3) information institutions linked to the information infrastructure that offer practical standardised information from various policy fields (such as planning, building & construction, water, soil, air, noise, etc.) required by the promoters and authorities.

The digital system is not one large ICT system, but a coherent set of agreements and ICT facilities, recordings, data collections and sources. This system ensures that the promoters, interested parties and authorities can consult the information they need for the Environment and Planning Act's processes. Furthermore, all information must be easily accessible for everyone, which is not the case right now. Data sets are created as a result of varying motives and interests, which is why data on the physical environment is not always sufficiently available, usable or durable to be used right now.

The role that citizens and entrepreneurs increasingly ask and assume is of great importance. They want to be informed about and involved in the planning process through co-creation, or even be in the driver's seat. They could even perform their own measurements of noise levels or air quality, or develop technology (open data, 3D, etc.).

The Environment and Planning Act can only work properly if information, data, rules and decisions are digitised and made public and can be displayed easily. The quality, reliability and availability of information should be secured and should be easily understood by everyone. Among other things, such openness and transparency ensure that both public authorities and citizens have access to the same information.

2.2 Design principles

Digitisation will only succeed if the skills and expectations of citizens and entrepreneurs are included explicitly and continuously. This means that the digital system must not be set up from the perspective of a (steering) authority, but from the perspective of the user.

The availability of information is a basic requirement, but still by far not enough for a 'level playing field' for citizens and authorities. The information will have to be disclosed in such a way that even a non-skilled user will be able to be an equal discussion partner. And that is only possible when data are aggregated to information in line with the world as perceived by citizens. Visualisation in 3D makes information easier to understand for non-professionals. Maximum simplicity and transparency are, therefore, important conditions for the digital system as an instrument to support participation, but are not yet established.

There is a great diversity of parties who develop plans, both public and private. In order to do justice to this diversity and to make the interest of the user of the information paramount, it is necessary to differentiate in information supply. Each actor in the planning process has other questions and needs. A citizen participating in the planning process relies for his information needs on the government and on professional promoters. At the same time, the government and the professional players do not always have the funding, time and interest to make the information available to citizens in a comprehensible form. Ultimately, the digital system to support the Environment and Planning Act aims for citizens to receive individualised information, tailored to their personal situation and needs.

2.3 Increased focus on the needs of society

An integral part of the digital system will be the development of service formulae that describe what the service to the initiator of spatial plans will be like (VIVO, 2016). The service formulae also offer the government some guidance. By means of 'customer travel', the formulae will be tested in practice. Developing the service formulae in practice offers an insight into what this requires the municipalities to do in terms of customer processes, channels, work processes, information supply, human resources, financing and staff.

Between now and 2024, the service formulae will be developed and implemented within the municipalities. Starting point is that the service formulae are developed and tested in close cooperation with citizens and entrepreneurs. In this respect, the Netherlands is one of the frontrunners in Europe. In my view, we still pay too little attention to citizens who want to participate in the planning process. As far as I am concerned, informative and interactive 3D applications should be central in service formulae for participation processes.

3. 3D APPLICATIONS IN THE PLANNING PROCESS

3.1 Introduction

How can we involve the local community in a planning process that requires massive amounts of complex data? Nowadays, the general public still has practically no 3D visualisation tools to aid in visual understanding. Kunmar et al. (2016) considers this problem as the major cause for the non-involvement and negligible influence of the general public in policy making. We must realise that society has become more set on the visual recording and processing of information. The value of 3D stands or falls with the development of applications from a user perspective.

In practice, it is clear that from a user perspective, 3D is preferable to 2D. Many people use 3D technology each day. 3D movies have been around for years now, 3D printing techniques are also developing rapidly. However, mobile applications, smart phones and tablets in particular show the fastest development with the most users. Virtual reality (VR) and augmented reality (AR) are developing at lightning speed, also because the capacity and speed of smart phones and tablets are becoming ever greater. Samsung, for instance, includes a VR headset with its latest smart phone model, which can be placed in a headset. The quality of the image still leaves to be desired, but that is merely a matter of time.[4]

3.2 2D to 3D environment plans

According to Stoter (2015), 3D environmental plans are the future. Instead of a 2D map and extensive descriptions, municipalities should make a 3D model, visualising all the relevant information for a particular area. That would not only be buildings and

objects in the public area, but environmental aspects with a spatial dimension, such as air quality, noise, external security, soil quality and mobility as well. Changes in time can be visualised better in 3D than in 2D. However, according to Stoter, 3D won't really take off until the market picks up on it by developing new applications. Many 3D geodata sets have been developed through market initiatives, such as the Esri[5] 3D content initiative, with open 3D viewing services for a number of Dutch cities (Stoter, 2015).

Environment plans in 3D mainly have four user groups:

The government itself, for the benefit of its public tasks;

Promoters intent on realising a (building) design;

Citizens who wish to be involved in the proposed spatial developments;

Entrepreneurs who use the data in commercial applications.

The dataset used in the Netherlands to build the environment plan is the Basic Registration Large-scale Topography (BGT). The BGT records detailed spatial information and provides input for spatial models. Of the currently available basic recordings, only the IMBRO model for the subsoil offers 3D information. In principle, the BGT could easily be expanded to offer 3D models if elevation data were available through a national public facility, but that isn't the case yet. Some municipalities already use elevation data in models. Those models, however, have primarily been developed for the first mentioned target group, the government itself, rather than for participation by society.

Standardisation of the models is necessary for all user groups. That is why national agreements on the supply of data or data sets are needed. After all, an environmental plan is a legal document of which the content should be validated. This also means that the data must be well-protected, but at the same time be sufficiently open to stimulate market initiatives leading to innovations in 3D applications. The more open data are available, the more interesting it becomes for entrepreneurs to develop new, innovative, 3D visualisations.

3.3 3D city modelling

'Local governments and cities around the globe are rapidly incorporating advanced 3D tools and technologies into their planning, design, construction and operations. 3D GIS and 3D CAD technologies connected to local government databases and businesses are weaving a common thread throughout communities. Improved mapping, collaboration, 3D building designs and visualised opportunities for better education and understanding all flow from these new technological assets'.[vi] Reality or wishful thinking?

The first 3D city models were developed as early as in the late 1990s. Around that time, the first steps were made to develop Google Earth. This application is now used by many individuals as well as urban planners. In 2015, the ISPRS International Journal published a comprehensive state of the art review of 3D city model applications. In this study, the authors demonstrated that 3D city models were used in at least 29 cases as a part of more than 100 applications. According to the authors, the comprehensive inventory could 'be useful for scientists as well as stakeholders in the geospatial industry, such as companies and national mapping agencies, as it may serve as a reference document to better position their operations, design product portfolios, and understand the market' (Biljecki and Stoter et al. 2015, p. 2842).

Geodata developments are moving fast as well. In the Netherlands, 3D is now supported in the optional part of IMGeo, the Basic Registration Large-scale Topography (BGT)'s information model. Around the globe, we see 3D city models being developed (Jackson & Simpson, 2012). The X3D Blacksburg Collaborative (Virginia Tech), for example, is developing a city model of the town of Blacksburg and its surroundings.[7] The city of Adelaide, Australia, has created a 3D city model as a key tool to assist in planning for the City's future[8]. The city of Austin, Texas also uses 3D models for urban planning, to improve research and decision-making by urban planners.[9] And a last example: the city model for Pretoria's Tshwane district. Various design teams created a collaborative 'master plan' that everyone could work from.[10]

Who or what are the driving forces behind the rapidly expanding 3D city modelling? In the private sector, these are the major firms of architects and planners, who are modelling in 3D for public consultations in their urban projects. The most important corporation for 3D city modelling is Esri, which has a virtual monopoly in government planning departments with its ArcGIS suite of tools, now being updated through their recent purchases of Google Earth Enterprise and ETH-Z's procedural modelling software 'CityEngine'.[11] Top university

centres on 3D modelling and 3D visualisation include MIT (SENSEable Cities Lab in Boston and Singapore), ETH-Zurich's Future City Lab in Zurich and Singapore, CASA at University College London and the Institute for Advanced Architecture Catalonia in Barcelona, but many other scientific institutes around the world experiment with 3D city modelling (Jackson & Simpson, 2012).

The examples of current initiatives in 3D city planning, public as well as private, show that 3D city models can perform several functions at the same time. From a public perspective, it is a tool for professional city planners and a means to develop tourism by informing visitors about places and buildings. From a private perspective, city models combined with other sources of (big) data, can be used for commercial (development) purposes. From a scientific perspective, city models are a useful database for research.

From the perspective of participation in the planning process, 3D city models could be modified for virtual reality (VR) and augmented reality (AR) applications.

3.4 VR and AR

From the perspective of enhancing a Smart Society, the potential of 3D visualisation techniques for interactive public participation is most interesting. A Smart Society can be seen as 'one that successfully harnesses the potential of digital technology and connected devices and the use of digital networks to improve people's lives' (Levy & Wong, 2014). By experimenting with augmented reality (AR) and virtual reality (VR) we can gather valuable information about the way people experience new developments and changing environments in their own neighbourhood and city.Virtual reality is the term used to describe **a** three-dimensional, computer-generated environment that can be explored and interacted with by a person. That person becomes part of this virtual world or is immersed in this environment and whilst there, is able to manipulate objects or perform a series of actions.[12] VR has already been used in a wide number of fields.[13] With the introduction of the Oculus Rift[14], the Samsung Gear VR[15] and the Hololens by Microsoft[16], VR technology is becoming affordable for the main public.

The next generation comprises new applications like Web-based Virtual Reality Geographical Information Systems (WebVRGIS). However, an experiment with WebVRGIS in Shenzhen, China, showed that the quality of the VR modelling on a city scale depends highly on the available volume of data (Varna et al. 2016). Another promising development are Peer-to-Peer (P2P) network engines for geographic VR data and GIS analysis, which combines VR, 3D GIS and P2P networks (Zhihan et al., 2013). The P2P network makes a mapping of the users in real and virtual space. It could support VRGIS functions and serve as a web engine for 3D globe and digital city. However, like with WebVRGIS, the processing of massive amounts of (big) data and making them available in a web application for mobile devices is really challenging (Li et al., 2015).

Simulation technology like the CityEngine, the OpenSimulator and CafuEngine are rapidly developing VR tools for use in 3D urban planning[17]. Zhang and Moore (2014) made a comparative study of a three-dimensional VR model against 3D models built with ArcGIS and BricsCAD tools. The results from the comparison with GIS and CAD were significantly positive as to ease-of-use and faster task completion in an urban planning context.

What is augmented reality (AR)? 'AR supplements the real world with virtual (computer-generated) objects that appear to coexist in the same space as the real world' (Azuma, 2001, p. 34). The public is getting accustomed to using virtual reality apps. A few years ago, we witnessed the introduction of Google Glass and earlier this year, Nintendo launched the popular AR game Pokémon Go. The potential of AR for planning practice is hard to overestimate. In the Netherlands, 4 out of 5 people have a smart phone, and 65% a tablet.[18]

Clearly, the hardware is no impediment to the large-scale application of AR in planning practice. What we need is access to data and parties interested in the development of tools that expand the toolkit of the urban professional responsible for participation and that can be applies in almost every phase of a planning process (Reinwald, 2014). Olsson (2012, p. 739), who compared the effect of AR on a mobile system with paper visualisations of the plans, concluded that AR was highly useful to visualise building plans in a 'holistic and intuitive way from the first-person point of view, thus having a clear additional value over the traditional printout-based visualisations'. The results of case studies points in the same direction (for example Garnero, 2013 and Wanarat & Nuanwan, 2013).

In architecture, AR and VR applications are developing rapidly.[19] What promotes this development is the availability of data sets in CAD and Construction Information Management systems (Bouw Informatie Management, BIM). This offers

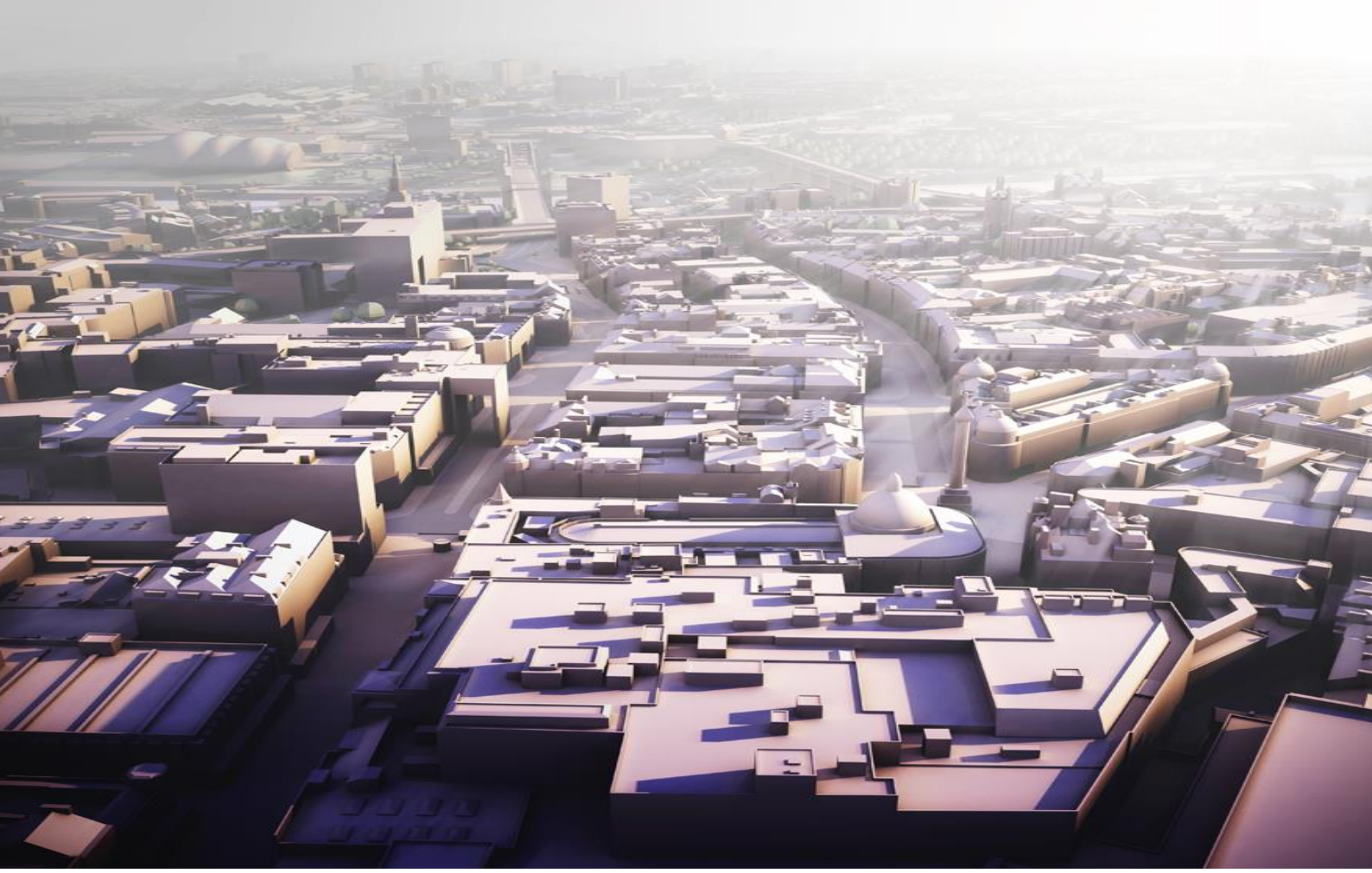

Figure 1. Virtual Newcastle Gateshead (source: Northumbria University)

prospects for AR and VR application at site level as well, as the Netherlands shows a strong increase in the number of data sets shared by municipalities and provinces on data platform.[20] Cooperating with other organisations such as knowledge institutions creates more new initiatives. The introduction of the Dutch Environment and Planning Act is expected to boost this development in the Netherlands even more. The major challenge will be to stimulate the development of AR and VR applications that use existing and new data platforms (like the digital system being developed in the Netherlands). AR and VR also enable us to get community input regarding subjective aspects of the urban environment (Sabri et al., 2016). Society could thus have a significant influence on the planning process. 3D city models using AR and VR techniques are therefore important incentives for social innovation in the physical environment.

4. SOCIAL MEDIA AND PUBLIC PARTICIPATION

How can planning professionals use social media to stimulate the sharing of ideas, opinions and information, thus enhancing the involvement of society in the planning process?

4.1 Interaction between planning professionals and society

Planning professionals should invite and enable community members and other interested actors to communicate about plans and their effects. There are several strategies to design public participation in the planning process effectively. Based on a review of more than 250 articles and books, Bryson et al. (2013) answered the question of how to design public participation. He provided us with a dozen guidelines, most of which also apply to online participation.

According to Bryson et al., it will first of all be necessary to establish that a public participation process is needed, and that it is based on a clear understanding of the challenge or problem (a part of the specific context) for which public participation is a desirable part of the response. The community members may have different views on the problem or challenge, and they determine the legitimacy of the process. The same applies to the management of expectations. Can the participants ask questions about the plan or project, are they supposed to give their opinion, or are they expected to co-create or even co-decide? In the latter case, an appropriate set of rules and a structure are needed to guide operational decision-making. Who gets to be involved in decision-making and how? According to the guidelines, it is necessary to manage power dynamics to provide opportunities for meaningful

participation.

Secondly, the purposes and desired outcomes of the participation process have to be clarified and, if necessary, regularly re-designed. In an online participation process, the community re-design is more an ongoing and co-creative process than a regularly performed activity by the professional.

Thirdly, every participation process, whether offline or online, must be monitored and evaluated. The outcome of evaluations must be shared with the participants. It should also be perfectly clear how the outcome of the process will be used. Because planning is a cyclic process, participation never stops. Whereas the 'traditional' participation process stops after the initial planning phase, the online participation process continues, but with a changing community.

In most major infrastructure projects in the Netherlands, social media like Facebook and Twitter are an integrated part of the communication strategy. The absence of research publications makes it impossible to evaluate the effectiveness of the use of social media in the planning process.

4.2 Interaction within a community

Interaction within a community will increasingly take place through social media. For example, there are over 4,500 WhatsApp groups for neighbourhood watches in the Netherlands and Belgium.[21] In his dissertation on social media use, Robin Effing concludes that the perceived value of social media for non-profit communities depends on having a social media strategy (Effing, 2014). This is not a strategy composed by a professional outside the community, but by the community itself. That is the most distinctive difference from the participation process as described in paragraph 4.1. As in the case of the neighbourhood WhatsApp groups, it is important for communities to develop an integrated approach to their social media strategy. According to Effing (2014, p. 137), 'a strategy will exploit the potential benefits and provide the community with the advantages of social media, such as reaching potential new members, and on the other hand, it regulates the downsides of use, such as reducing the impact of social media attacks on the community. In addition to having an integrated approach, it is important to understand that there is no one-size-fits-all strategy, but that the strategy depends to a large extent on the chosen social media channels, the specific nature and goals of the community, and its environment'. He mentions seven key elements of the social media strategy within a community and most of them also apply to a planning process.

First of all, the use of social media should have a pre-defined goal to be effective and also a target audience that can be reached through social media channels. Secondly, it would be useful to know what behaviour is to be expected from this audience. Thirdly, there has to be some kind of organisation and resources within the community to make and carry out an activity plan to guarantee the continuity of the interaction as much as possible and also to monitor the communication on social media channels to prevent bullying, harassment and gossip as well as to prevent conversations from escalating and causing severe reputational damage.

Communities that have set up a social media channel to mobilise citizens against government plans can be very successful – see for example the occupation of Taksim Square and Gezi Park in Istanbul, Turkey in 2013[22].

5. FURTHER RESEARCH

Research on visualisation tools to support planning practice is carried out from perspectives like geographic information science, computer graphics, 3D city modelling, interaction design and urban planning. Based on an analysis of 114 articles, published in 2004-2014, Billger et al. (2016) conclude that studies of implemented tools in real planning processes are still rare. Lovett et al. also stress the need for systematic evaluation of applications for 3D visualisation techniques (Lovett, 2015). According to Brown and Kyttä (2014), there is a need for more empirical research to increase participation rates by using GIS (PPGIS). However, an important precondition for that kind of research is the availability of web-based PPGIS tools (Butt and Li, 2012). Another way to experiment with 3D visualisation tools is through serious gaming (Poplin, 2012).

Both empirical research and serious gaming are part of our research programme at Saxion UAS. One of our main topics is participation. With the support of the Dutch Ministry of Infrastructure and Environment, we established a LivingLab to carry out research projects that support the implementation of the Environment and Planning Act and the digital system. At the moment some 10 municipalities, a province, 2 water control boards and 2 civil organisations participate in experiments with the new legislation. One of the municipalities is currently working on a 3D environmental plan which will be subject to participation later this year. With groups of students, we will conduct experiments

with digital vs analogue participation. The purpose of these experiments is to better understand the citizens' information needs, to determine the possibilities that 3D technology offers and to evaluate the effectiveness of the various forms of participation. On that basis, we aim to develop new 3D applications to be used in the planning process in multidisciplinary teams. We also intend to research the development and application of social media strategies in the context of the Environment and Planning Act.

Although the development and management of big data for cities using virtual reality technology is an inspiring and promising approach, we can identify some serious challenges. First of all, we must learn more about user preferences, especially regarding VR and AR, if we want to involve more citizens in the planning process. That's what we are working on now in our LivingLab. Another challenge is to deal with the increased amount of (big) data and the quality of that data: in other words: "data we have, information we need". Thirdly, we must evaluate the use of social media by society itself critically. The instrument itself can be very useful in a participation process, but when initiated by professionals this usually fails.

6. CONCLUSION

We can conclude that, due to their multiple purpose use and business opportunities, 3D city modelling, VR and AR applications are innovative and promising tools for public participation in the planning process and rapidly growing commercial market. It is also a fascinating field of applied research. It is important that governments and businesses adopt policies that support 3D digital technologies such as AR and VR, in particular when applied in planning and decision-making processes in which interactive public participation is desirable or required. The development of digital systems that support the new Dutch Environment and Planning Act in the Netherlands offers us a unique opportunity to make a great leap forward in 3D applications, not just for planning professionals but in particular to stimulate an innovative urban planning practice that involves interactive digital public participation.

ENDNOTES

1 TK 2013-2014, MvT 33 962 Nr. 3 (https://zoek.officielebekendmakingen.nl/kst-33962-3.html)
2 Nadere memorie van antwoord, 16 February 2016 (https://www.eerstekamer.nl/wetsvoorstel/33962_omgevingswet)
3 Vision letter e-government 2017 (https://www.rijksoverheid.nl/documenten/kamerstukken/2013/05/23/visiebrief-digitale-overheid-2017)
4 http://www.tested.com/tech/556752-testing-samsung-gear-vr-consumer-release/
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6 https://www.3dvisworld.com/features/feature-articles/6133-new-approaches-for-3d-city-design-and-urban-planning.html
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10 http://www.arup.com/3d_city_modeling
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12 http://www.vrs.org.uk/virtual-reality/what-is-virtual-reality.html
13 http://www.vrs.org.uk/virtual-reality-applications/
14 https://www3.oculus.com/en-us/rift/
15 http://www.samsung.com/nl/consumer/mobile-phone/wearable/galaxy-gear/SM-R322NZWAPHN
16 https://www.microsoft.com/microsoft-hololens/en-us
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Inspire and be inspired: an innovative, crowd sourced design of the Spatial Structural Vision 2030 'Room for Ghent' (Belgium)

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1. GHENT LOOKS FORWARD TO AN AMBITIOUS AND INNOVATIVE FUTURE

Ghent is a city of approximately 320,000 inhabitants (approximately 250,000 inhabitants and over 70,000 daily college and university students), situated in the centre of the Flanders Region (Belgium). The city has a strong tradition of strategic urban planning. Monitoring and analysis have shown that the spatial vision of the current Spatial Structure Plan of Ghent (for 1999 to 2003) is actually still accurate. Nevertheless some aspects require further explanation or renewed insights. Some emphases and priorities need to be revised. The result will be a renewed plan: the Spatial Structural Vision 2030, 'Room for Ghent'. We are pursuing a shift of emphasis for several subjects. This includes:

- a thorough update to formulate a coherent and forward looking answer to the new challenges as regards a liveable, climate proof and child-friendly city;
- a more strategic policy document that is less detailed and prescriptive, albeit with well defined limits, capable of weighing up and using the development potential of the city at any time and in a more flexible manner;
- focusing on a systematic policy driven use of space while taking account of the living environment of the inhabitants, as well as their everyday use of space;
- developing a planning policy in which citizens can play a more active role (co-creation).

Overall, spatial capacity and spatial quality are key concepts.

2. SOCIAL AND SPATIAL CHALLENGES OF THE FUTURE

Which new challenges are to be expected?

2.1 The liveability challenge: transforming the city into a liveable environment for young and old with sufficient and well distributed green areas

The liveability challenge is quite broad and comprises very divergent aspects (social, cultural, economic and ecological) that often interfere with other challenges: a liveable city is simultaneously an accessible city, with a balanced and affordable housing market, as well as sufficient (differentiated) job opportunities. Climate change and growing car traffic puts urban liveability under pressure. A liveable city is also a child-friendly city. This requires an integrated approach: all children need education, should be able to move safely, to play and to engage in sports. Spatial planning plays a crucial role in this regard.

2.2 The climate challenge: sustainable and climate proof spatial development

The depletion of fossil fuels and climate change are global issues which also require answers at the local scale. Spatial measures are playing a vital role. For instance by organising the space in such a way that the mobility pattern of people is changing, or by means of sustainable house renovation, we are able to reduce the need for energy - and thus CO2 emissions (mitigation). In Ghent green areas and water can positively contribute to the cooling of the urban environment. A more open urban structure decreases the urban heat island effect (currently already 3 to 8 ° C hotter than outside the city). Open spaces are also necessary to capture water in case of heavy rainfall and to retain water in periods of drought (adaptation).

2.3 The demographic challenge: tackling the growth and altering the composition of the population in a sensible way

Ghent's population keeps expanding and 20,000 extra citizens are expected by 2030. Moreover, family and social structures are changing. There are more small households, as young families are leaving the city. All these demographic trends are creating new social and spatial challenges.

On the one hand, these questions require a policy which focuses on a differentiated, suitable, affordable and high-grade living (10,000 suitable dwellings are needed). This implies measures tailored to the family composition, age and / or physical disabilities. They encompass sufficient (supporting) facilities: education, greenery, recreation, (child friendly) public areas and more.

On the other hand, we need to pursue a policy which facilitates a well-considered use of scarce available space and land. We are looking for smart methods of densification: new high-grade housing typologies and densification of the 20th century districts. The challenge of the future is to provide compact and high-grade housing with ample open space. The duality of our society also plays a role in the city dynamic; we therefore need to address the spatial consequences of social segregation and will investigate how we will be able to mitigate their effects from a spatial viewpoint.

2.4 The mobility challenge: the need for selective access of the city and its region

As regards mobility, we can observe two tendencies in Ghent.

On the one hand, Ghent is subjected to an increasing force of attraction, owing to demographic growth, an increase in the number of students and commuters, and a higher activity level. On the other hand, Ghent has been playing a pioneering role in the past decades as regards sustainable urban mobility. We are reaping the first fruits of these developments.

The immediate pressure from the metropolitan region remains the key mobility challenge: in absolute numbers, the car traffic from the neighbouring suburbs is still increasing, owing to growing housing provision and other activities. Public transport supply and safe and direct bicycle links are often lacking, thus raising car dependency and increasing traffic on the main roads towards the city. Moreover, historically the current transport model, including trams and buses, has a strong radial orientation towards the city centre. However, because many (large-scale) functions are situated outside the historic centre, Ghent has gradually evolved towards a polycentric municipal structure. This means a larger spatial and mobility interaction between various urban growth centres, enhanced further by often mono-functional developments which affect the distribution of activities (housing, working, shopping, education). These developments are partly breaking up the historic radial movement pattern, with a huge impact on overall mobility.

If we want to maintain the persistent current mobility trends, we will have to adopt smart growth strategies for the urban districts and suburbs to safeguard and enhance manageable and sustainable mobility. Besides car traffic, we will have to develop bicycle traffic and public transport as fully-fledged mobility systems, tailored to the Ghent region. This challenge requires a quantum leap of mobility and spatial policy. The current transport systems are insufficiently adapted to the existing spatial organisation, and vice versa. Next to promoting and accommodating bicycle use, we will also need to focus both on managing flows and impacts of spatial developments on the mobility system. As regards public transport, we will increasingly build on the potential of locating spatial developments on interchanges and public transport axes. Individual motorised traffic needs to be disconnected from individual vehicle ownership; car sharing systems are gradually outgrowing the niche level. The perceptible revolution in the freight and distribution systems requires spatial support.

2.5 The economic challenge: spatial support of the growing, changing and innovative economy

In order to meet our employment objectives and to reduce unemployment we need additional, differentiated and suitable job opportunities in Ghent. 30,000 new jobs will be needed by 2030. A future-oriented employment development will be required to raise - or even to maintain - job opportunities. We have to take into account new economic trends and tendencies. High-grade space for the economy is one of the essential conditions to create jobs.

The challenge consists of well-planned economic growth for further diversification of the economy, by creating sufficient space for companies in growth sectors, such as energy and environmental technology, as well as the creative sector.

Through monitoring and target-oriented research, we can react more swiftly and make a correct assessment of the new economic trends. This will

enable us to provide an appropriate high-grade offer.

3. OPTING FOR A CROWD-SOURCED DESIGN OF SPATIAL PLANNING

We opt explicitly to design the Structural Vision 2030 "Room for Gent" as a spatial but also a crowd-sourced plan. This human-centred approach means that we:

- pursue the ambition to pay more attention than before to everyday spatial planning on behalf of the citizens (planning based on their living environment);
- give citizens an active role in spatial policy formulation (co-creation), besides traditional involvement of experts, sector organisations and decision makers.

These two aspects of crowd-sourced planning are closely related to investigating which social and spatial knowledge and competences are required for the spatial policy. On the one hand, we need to count on active participation of citizens in co-creating the space by mobilising their local knowledge of the area and its use.

On the other hand, it means that the preparation of spatial project briefs and the analytical phase of the spatial policy plans draw on more than physical-spatial expertise. This should avoid that the planning process is prematurely narrowed down to physical-spatial tasks (e.g. densification). Thus, we will identify which other actors we need to involve during spatial interventions. We are aware that there is a need for inputs by social scientists and professionals (social planners, social workers, participation professionals) who can provide expert knowledge on social trends and (their impacts on) the use of space into the spatial policy process.

Whoever approaches the space from the perspective of the users and enables them to play a more active role in spatial policy, will inevitably be confronted by the social stratification of society. Citizens differ in their socio-economic position (class), level of education, gender, ethnic-cultural background, sex, age, lifestyle, etc. These differences are compounded by power relations, which express themselves in the unequal capacity of the various groups to shape the use and design of space to their proper interests, needs and aspirations. From the 117,665 families in Ghent 30% have foreign roots. The population density is 1,622 inhabitants/km2.

Ultimately, spatial policy has to reach a position. However, based on their democratic mission spatial policy makers will have to ensure that all social groups are treated more or less equally. This means that planning policy is also an instrument of community building. This includes providing space for diverse human activities in accordance with spatial planning and certain types of land use, choice of locations for service provision and economic activities, flexibility of spatial rules, access to the use of spatial and other instruments, and throughout the role of citizens in spatial policy making.

When regional policymakers are entering into negotiations with various space users they have to see to it, according to their democratic mandate, that all social groups are equally addressed. Based on their status and mandate as spatial experts, they are reconciling the demand of citizens as regards the use of space with the capacity of spatial systems. Until now, their mission statement was all too often included in the instrument of judicial rules, which led to a deficient anticipation of social trends, changes in land use and the desire of citizens to jointly determine the space. Crowd-sourced planning will provide a new meaning. Where planners previously facilitated predetermined (desired) socio-environmental practices, they now develop target-oriented instruments and flexible budgets which should enable them to proceed more effectively to achievements.

The pilot projects that are elaborated in parallel to the intrinsic process of the Structural Vision 2030 'Room for Gent' represent an ideal test case for the transition toward crowd-sourced planning (see below).

Broad societal debate

Various actors are playing a role during the preparation of the Structural Vision 2030 'Room for Ghent'. It is essential that all of them know their jobs and can provide input. That is why consultation and feedback run like a thread throughout the process. Good consultation structure and direction, a social debate, active communication and thorough data monitoring are crucial during the entire process, from the elaboration of the vision up to and including its actual completion.

To keep this in mind, a thorough internal process structure is necessary.

A project team represents the various municipal services involved. At regular intervals, they are providing vital input, based on their expertise (green areas, mobility, housing, etc.).

From the early beginning, the City of Ghent was keeping a finger on the pulse by means of a think tank. This consists of a diverse group of approximately thirty broad-minded Ghent citizens who experience the entire structure planning process. The group includes people who are feeling involved in the future of Ghent, can debate with an open mind, respect views of others and have sufficient motivation to participate during the entire process. During the think tank meetings, brainstorming sessions are held on a rather abstract and conceptual level about the spatial future of the city of Ghent. The results from these discussions provide inputs to the project team to achieve an innovating, future-oriented and sustainable spatial vision of Ghent.

Creating involvement

The preparation of such a structure plan is impossible without the involvement of a broader audience. From the beginning we opted for active public debate. Eventually, we will be dealing with an abstract message that may not be able to keep the attention of many people going. 2030 will indeed not quite occur in the immediate future. A structural vision is not immediately translated on the ground, old viewpoints do not change overnight. Moreover, it is certainly not a ready-made reality, but a vision in the making. The audience is required to show not only interest but also active participation. The target groups include a very wide range of ages, professional categories and social profiles. The challenge is to keep the process interesting, both for the specialised spatial planner as well as the student, young family, the elderly couple, the tourist, the entrepreneur, the employee in the social economy and so on.

Creating urgency was taking the first hurdle. How could we bring to the attention that 'Room for Ghent' is imminent, should be achieved, and will have consequences for all Ghent citizens? At the end of January 2015, a broader communication trajectory and a social debate were initiated, including a press conference and a 'stunt'. At the 'Gravensteen' (Castle of the Counts), Ghent's most important historical monument, a giant banner announced that the castle would accommodate luxury flats. Needless to say that press attention and 'buzz' were assured.

With the cooperation of a communications agency, the campaign was supported by social media. The proper media channels of the City of Ghent were also fully deployed.

www.ruimtevoor.gent

To reach the broadest possible diverse audience, the communication occurs via various channels, both online and offline. The online communication takes the lion's share, and constitutes the basis of the debate.

A tailor-made interactive website was created, next to the existing municipal website. In Spring 2015 everyone could post their own ideas about the future of Ghent. People could also share and like ideas of others. To make this comprehensible, a different theme was highlighted every month: working and learning, housing, leisure and meeting, nature and environment, care, transportation. Via social media a question was 'pitched' each week, boasting the necessary challenge to lure people towards the website and post their own ideas. Every month, a 'room maker of the month' was speaking in a film, spreading inspiration about the monthly theme.

The launch of two playful promotional films with renowned Ghent citizens generated interest of the regional and national press.

Besides a gathering place for inspiring ideas, the online platform also provides a calendar mentioning the activities as regards the city of the future, a news forum with reports, background information on 'Room for Ghent' and a newsletter.

Links to existing initiatives

The offline communication is just as important. Not everyone has access to the internet or is actively using social media channels. Billboards in the Ghent cityscape were supporting the campaign.

Furthermore, trajectory intakes were held from the very beginning, including a wide spectrum of organisations, research institutions and associations to jointly examine when and how their specific target audience can participate in the debate. Their participation is therefore

tailored to the specific target group and their input is gradually incorporated in the intrinsic process. Whenever possible and relevant, the City of Ghent links to current (policy) trajectories and meetings, such as 'District of the Month', highlighting a specific urban district. Internal communication, within the city administration, occurs with intranet messages, so-called 'lunch meetings' and articles in the staff magazine.

Switch between macro and micro levels

One of the key challenges in the public debate is translating the abstract message to the various target groups, while ensuring that the input of these groups transcends the local level, as to include them in the intrinsic process. However, the real story of the citizen is the starting point to achieve a broader vision.

Hence, every target group is encouraged and inspired on a micro level that is proper to its situation. Every single thing is relevant that could inspire people to tell how important life and work in the city is for them and which are their expectations. The Ghent citizens are indeed the experts with respect to life in the city. This activity is followed by an in-depth moment during which the stories are raised to a higher level. Discussions in different groups are moderated by a representative of the municipality or municipal staff member. Experience has shown that such an approach allows a constant switch between the micro and macro level and yields quite a satisfactory input.

The web link www.ruimtevoor.gent is using this method. The 'question of the week' or the 'space maker of the month' formulate a concrete discussion item, often providing broader answers. For example when someone in a film is telling about how he shares his garden with the neighbours, this starts a discussion about more meeting places in districts or the demand for more district parks.

Introduce landmarks

Since the campaign is stretched over such a long period of time, it is necessary to keep attention alive. Depending on the phases of the intrinsic process, the campaign is subdivided into several smaller campaigns, each with its proper focus and landmarks. These landmarks are important since they provide a feedback moment. The turning point was an inspiration day on behalf of a broad audience, including walking tours on several themes. Some ideas, assembled via the website and activities, are elaborated with an expert and public jury.

Pilot projects

Experts from the think tank, together with the City, selected some ideas suggested by Ghent citizens. In consultation with the authors of these proposals, a process of co-creation was initiated. Their ideas represent a possible future for Ghent. They incite to reflect on actual solutions and show what is feasible. Thus a study and an animation will show the potential when we remove a piece of the motorway from a residential district (E17 in Gentbrugge). Another pilot project will illustrate how unoccupied churches can be deployed in a different manner. A group that submitted an idea to pay more attention to short-chain agriculture started working on a vacant lot. An entire district gets a proper master plan and is examining how to improve the occupancy rate of unused inner areas. In turn, these bottom-up ideas offer inspiration for the Structural Vision 2030 and are revealing something about the spatial lines of force in the future.

By the end of 2016 the Structural Vision 2030 will be incorporated in the official procedure. Citizens will be informed about the contents of the structural vision during an information meeting and will be able to formulate their objections, remarks and comments during the public inquiry. A publication and several short films will clarify the selected choices. The structural vision will also be illustrated

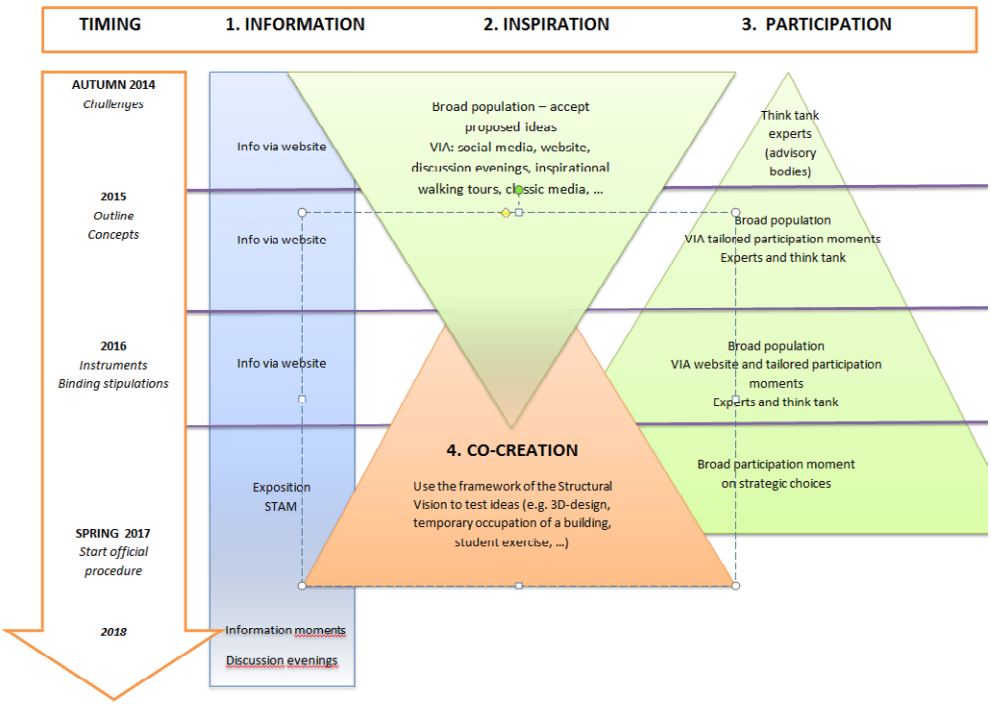

Figure 1. Scheme of participation and communication process. (Source: Stad Gent)

during an exhibition at the STAM City Museum.

4. VISION AND SPATIAL CONCEPTS FOR SPATIAL DEVELOPMENT: 'ROOM FOR GHENT'

The Structural Vision 2030 includes the global targets and ambitions of the City of Ghent as regards its spatial development. Based on this mission statement and the desire for a crowd-sourced design, 'Room for Gent' can be interpreted as 'Room for all Ghent Citizens'. The spatial development is intended to give all Ghent citizens (Ghent residents and Ghent users) the necessary liveable space for their development. The two parts of the title of this Structural Vision 2030 are each covering their share of its contents. 'Ghent' stands for everything that the municipality and the Ghent citizens (want to) accomplish:

- Ghent as an resilient and family friendly, coherent city boasting a mosaic of places with a proper identity
- Ghent as an authentic city
- Ghent as a high quality, viable and intertwined living and working city
- Ghent as an innovative city
- Ghent as a versatile city of knowledge and culture
- Ghent as a multi-layered, sustainable and climate proof city, which intends to remain liveable for future generations of Ghent citizens
- Ghent as a self-confident, pioneering, seducing and ruling cooperating city.
- 'Room for' illustrates the way in which we intend to achieve this in respect of the spatial aspect.

The vision elements can indicate how to offer a spatial response to the challenges we will be facing, in the (medium) long term, thus how to offer guarantees for a future proof city.

4.1 The vision elements

4.1.1 We are building a liveable city

Each spatial project is founded on the basic assumption that it needs to contribute to an increased quality of life. When a project can no longer warrant the viability of an area and its surroundings, the spatial capacity of that area is exceeded. Elements of capacity are protection, comfort, experience and focus on children and youngsters.

4.1.2 We are taking the physical system as the basis of spatial development

Throughout history Ghent developed itself on the physical system of the confluent river valleys of Scheldt and Lys. This physical system is also the basis of the further spatial development of the city. Certainly the water structure and the water system are determining spatial bearers. Many other patterns are adapting themselves to the physical system and, in particular, to the water. The substratum

is often literally an un-reclaimed area; it does not only impose preconditions during development, but it also provides a lot of (spatial) opportunities that we want to highlight. The subsoil codetermines the structure of the overhead spatial development.

4.1.3 We are opting for a cautious urban development

The spatial uniqueness, functionality and quality of the Ghent area (landscapes, urban structures, open and public spaces and buildings) are three criteria that occur at each spatial development. How it works (functionality) and what it looks like (image) are equivalent and have a strong mutual dialectics. We are taking into account the present characteristics, the significance and history and the possible future of a place, as well as the relation to its environment (genius loci): cautious urban development respects the stratification of an area. We continue to build on the existing city and reckon the existing spatial and social fabric (improvement without displacement). Cautious urban development supports the social dimension of living and working of the Ghent residents in the city. Spatial interventions are adding value, at a social, functional, scenic, economic and ecological level (in any case more value than the one that could have been lost).

4.1.4 We are making the city climate-proof by means of water and greenery

Green areas and water, varying from the large green poles at the edge of the city, over the green (blue) axes and the district parks, and also including street trees, green façade and rooftops are making the city attractive, liveable and climate proof. Green areas combined with water are cooling the city in summer and are mitigating the urban heat-island effect. Greenery also provides shade to cool urban areas on hot days.

The smallest green spots, including even a solitary tree, are also playing a crucial role. Green structures are not only significant in residential areas or within busy public areas, a fully-fledged green structure in economic clusters also constitutes an essential link for the management of urban temperature, the water system and the air quality in the urban fabric. Greenery plays an essential role in retaining, infiltrating and buffering rainwater and thus helps to prevent flooding. Reducing surface hardening is important to allow a maximum water infiltration into the soil.

At the urban level, greenery certainly has a positive impact on air quality. The direct effect (by absorption) of vegetation of noise is rather limited. However, the indirect effects are often more significant: we experience noise as less annoying in an attractive green environment.

4.1.5 We are striving for a sustainable use of space by innovating instead of merely expanding

When the city is expanding, this must be done in a sustainable way. Sensible growth is the key word. This can mainly be achieved by renewing the urban tissue and coping with urban expansion within the existing infrastructure. We are opting for innovative solutions in which the available space and the existing heritage are used in an (more) efficient manner, while simultaneously reckoning with its spatial capacity and spatial quality. An efficient use of the available space is also a prerequisite if Ghent wants to be a viable, child-friendly, climate neutral and climate proof city.

4.1.6 We are strongly focusing on public space

Optimal residential quality of public space is essential. We are designing a space in which everyone can stay and move independently, and is arranged in a child friendly way. Next to cohesion, design criteria also include (traffic) safety, scale, quality, readability, comfort and usability.

4.1.7 We are pursuing interweaving and diversity and are opting for proximity

One of the key assets of Ghent is its unique intertwinement. In the future we intend to highlight its vibrant mix of functions, atmospheres, architectural styles and cultures. The proximity and accessibility – a result of the city's scale – generate opportunities. The spatial options need to enable and strengthen this intertwinement. In this regard, not only inhabitants, but also other users (students, tourists, commuters, employees, etc.) should each get their proper spot(s) in the city without jeopardising the balance within and the viability of these spots.

Within its neighbourhood (within walking or cycling distance) every Ghent citizen should have access to (local) basic services such as local food, exercise and play, greenery, employment, education and health care. By introducing new amenities and services and by opening and creating east access to large, multifunctional complexes of enterprises and facilities (hospitals, schools, sports halls ...) we will create micro-centrality. Thus we are reducing the

number of car trips of a family. We will also enhance social cohesion, anticipating demographic growth and the demand for facilities, as well as creating space for economic development. By focusing on densification and proximity new densification opportunities will arise.

4.1.8 We are opting for a selective, but high-grade accessibility

Intertwinement, diversity and proximity require selective accessibility. More people means more flows. The city needs to be accessible to everyone, but not at the expense of quality of life in and around the city. We are striving towards an accessible and liveable city, with high-quality contemporary urban mobility. Diversity should once again be the keyword, deploying diverse modes of transporting goods and passengers, thus effectively achieving a symbiosis between accessibility and liveability. Cycling and walking are the basis of this strategy.

4.1.9 We are stimulating dynamic and change-oriented constructions

By taking into account the future modification and usage opportunities of design and realisation, it is possible to prolong the useful life expectancy of buildings and building elements. Thus, we anticipate a change of needs and a reduction of environmental impacts of construction.

4.1.10 We are looking for spatial synergies in the metropolitan area

Spatial structures and developments do not stop at the city boundaries. Spatial developments such as housing, employment, mobility, security, the use of infrastructure and facilities, nature and greenery (poles) or food supply are discussed at the level of the urban region. Thus we adapt the (spatial) policy to the existing interweaving between Ghent and its neighbouring municipalities, we ensure that synergies occur and we also develop the urban region in a balanced, sustainable manner.

4.2 The spatial concepts

The spatial concepts indicate in short the main features of the way in which we are dealing with space in and around Ghent, and especially with structuring its subdivisions, and how they need to be developed to achieve the spatial vision. They are the basis of further development of the Structural Vision 2030 in later projects, plans and instruments. They are stable and are looking forward (at least) to 2030, and whenever possible even until 2050.

The following five spatial concepts are involved:

1. water, topography and soil are the basis of the expanding city

2. water and green areas are giving oxygen to the city

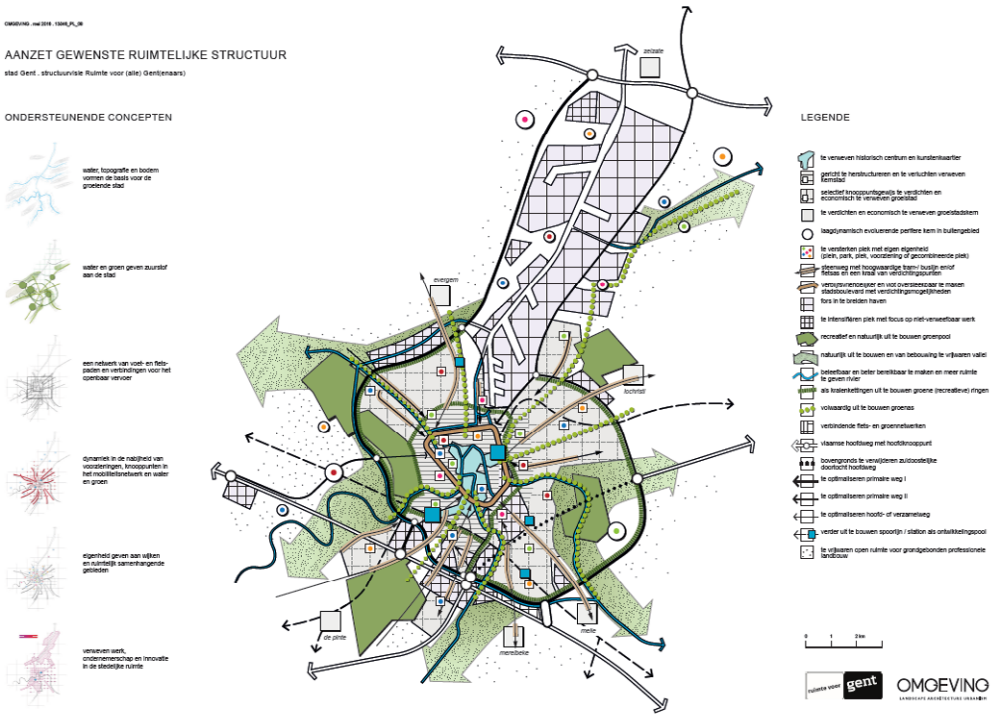

Figure 2. Source: Stad Gent and OMGEVING cvba

3. the network of pedestrian paths and cycle tracks and connections to public transport are providing selected accessibility

4. the densification occurs in a smart way in the immediate vicinity of infrastructures, at junctions in the mobility network and in the urban green-blue areas

5. employment, entrepreneurship and innovation are interwoven in the urban space.

4.3 The desired spatial structure

The desired spatial structure combines five (equivalent) spatial concepts with spatial networks and emphasises its internal cohesion (Figue 2).

4.4 Looking for implementation

The City of Ghent, the provincial and regional authorities, the private initiators and Ghent citizens are assuming different roles in the spatial development of the city.

The local authority plays a significant initiating and active role in achieving a robust structure of the spatial networks. This is the case for the realisation of new (green) public space, raising the residential quality of existing public space and strengthening the bicycle network. The local authority is the key partner of other authorities in the development of the public transport network, the protection and safeguard of open space.

The local authority has a pioneering and directing role in fulfilling objectives such as interweaving, densification, quality and uniqueness. For a number of goals, it remains the leading party: the realisation of social infrastructure is a prime responsibility of the authority. By planning these provisions at the appropriate places in the urban tissue, we can strengthen and support the network structure. Yet, in future, these kind of achievements will evolve towards cooperation and shared responsibility with residents and users.

The majority of spatial realisations are private initiatives. The local government is assuming a directing role to ensure that these private initiatives do contribute to an enhanced quality of a place, a district and the city as a whole.

To implement the ideas and options from the Structural Vision 2030 we count on the following aspects.

4.4.1 The significance of design, design research and quality monitoring

Good design is often the result of design research. High-quality design and design research are stimulated in various ways as methodology:

- by accompanying private parties and inciting them to design competitions
- by organising proper design competitions
- by conducting design research (research of building blocks).

A 'city architect' cooperates with a Quality Chamber for spatial and architectural quality.

4.4.2 Stimulating behaviour modification and consciousness as regards spatial quality

There is a need for an evolving mentality as regards property. The basis of our property model dates from Napoleonic times, ensuing in individual and collective capacity development. In Ghent 50% of the residents live in a home they own. However, all sustainability insights indicate that an evolution from property to use as the basis of a sustainable society is the next logical step. We are also stimulating increasing consciousness with respect to quality of proximity, greenery and water.

4.4.3 Implementing spatial strategic projects

We distinguish strategic places the transformation of which is essential in implementing spatial ambitions. On the one hand, it involves some large-scale places within the built fabric in which space will become available in the coming decades that can be developed or transformed. On the other hand, in the rural areas we have areas for which we will make sharp strategic policy choices. The structure planning process includes reflection and design exercises that will portray the potential as well as the surplus value of these strategic locations.

4.4.4 Deploying (innovative) instruments

We will elaborate instruments for the gradual implementation of spatial options: incentive instruments (e.g. books of examples (prototypes / models) and subsidies), co-productive instruments (e.g. setting up and supporting bottom-up experiments), directing instruments (including regulatory and policy guideline frameworks, acquisition) and internally directive instruments (e.g.

organising workshops, efficient project structures).

4.4.5 Monitoring and assessing the spatial development

Because of the process-oriented character of structure planning, systematic monitoring and assessment is anchored in implementation. By determining the correct (feasible) indicators, we will monitor the impact of spatial choices in a transparent way. Spatial strategic projects are continuously assessed and checked as to their spatial policy choices.

4.4.6 Cooperation with other authorities

Achieving the options of the Structural Vision is a combined action between diverse actors, in which other authorities are playing a significant role. For those aspects which explicitly belong to the competence of other authorities, we as local authority are submitting suggestions and initiate cooperation.

4.5 CONCLUSION

The Structural Vision Ghent 2030 is innovative in a Flemish and an international context, both intrinsically and with respect to the process.

1. The Structural Vision 2030 'Room for Gent' is the first local spatial structure plan in the Flanders region that completely fits into the current strategic and financial long-range plan of the city and posits itself as a coordinating spatial vision document next to (agreed and supported) sectorial policy documents, of which they are the spatial framework.

2. It is the first local spatial structure plan in the Flanders region with the ambition and the instruments to achieve a 100% space efficiency within the current urban configuration, meaning that on balance it does not have to include new hard developments (turning ground into hard surfaces).

3. It does not mention detailed and localised statements, but contains a set of assessment frameworks and procedures and a practiced organisation structure in order to make spatially and socially responsible choices and use the available opportunities throughout all urban challenges.

4. It opts for a radical interweaving of functions and an economic use of space and it translates this into appropriate assessment frameworks and instruments.

5. It is the first crowd sourced local spatial structure plan in the Flanders region; vision and content are elaborated by means of broad co-creation and include a thoughtful component of co-creation and behaviour management to achieve its implementation.

6. It is the first local spatial structure plan that looks beyond 2030 to 2050, as regards the consequent building on the physical system, future-oriented infrastructure and climate resilience (including effective spaces for water and growth of green areas at all scales). The structural vision does not only provide a framework for necessary short-term achievements, but simultaneously links them to – equally indispensable - long-term goals and strategic projects

7. It is the first local spatial structure plan that deploys the bicycle as a basis of urban development, more than public transport, and considerably more than the car.

Figue 3. Children at work in one of the "Room for Ghent" workshops. Source: Stad Gent

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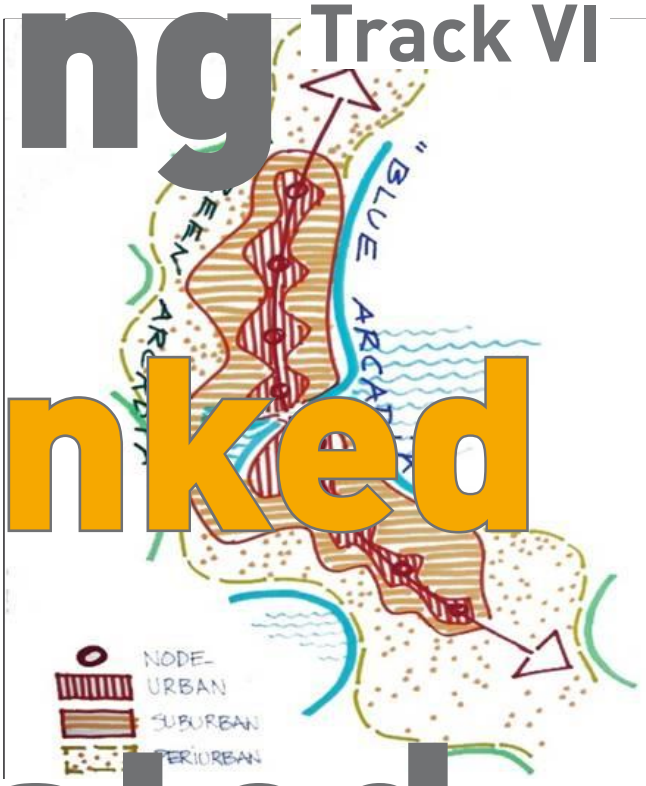
"CITIES WE HAVE VS. CITIES WE NEED"

Track VI

Planning for an interlinked and integrated rural-urban development



Final Report

by Tathagata Chatterij (India), Lorraine Gonzales (USA) & James Chakwizira (South Africa)

INTRODUCTION

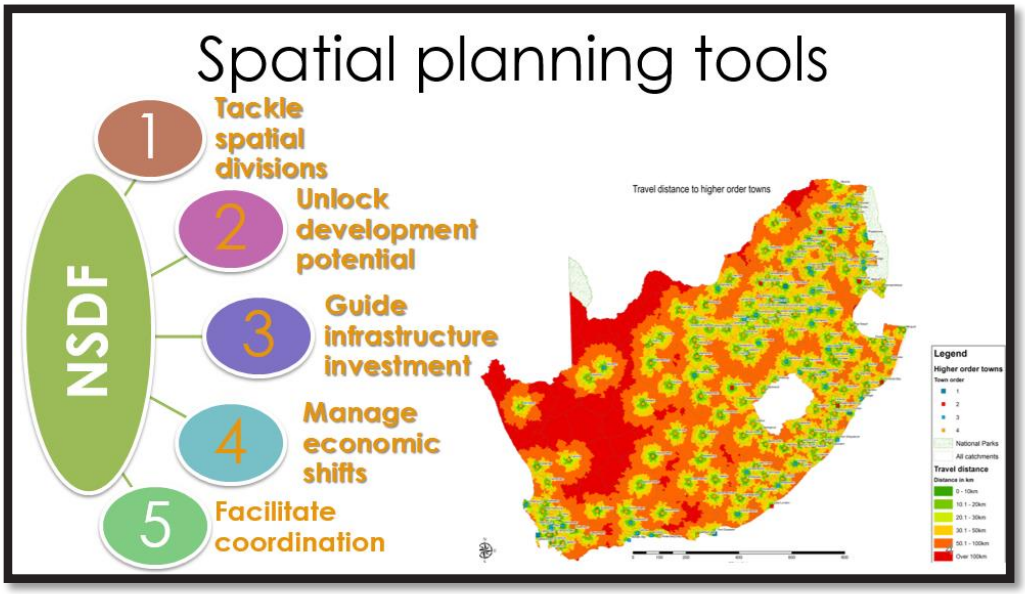
Track 6 explored the changing conceptualization of the urban rural divide and the possibility of new forms of urbanity and rural existence, through five thematically organized discussion sessions. Session 6.1 discussed with the application of spatial planning as an instrument to achieve a more harmonious relationship between rural and urban areas. Session 6.2 focused on the use of spatial planning to generate economic growth opportunities at the local level. Session 6.3 explored the fundamental changes in rural-urban relations brought about by urbanization and migration that resulted in a need to protect and preserve those settlement patterns that threatened the cultural attributes and qualities of life. Session 6.4 looked at the complexities involved in rural-urban relations from the stand points of major developing countries. Session 6.5 focused on peri-urban interface – the areas which often depict a mix of rural-urban land use characteristics.

THEMES & KEY POINTS

Two overarching messages emerged out of the discussions under Track 6. First, there is a need to focus on planning issues at a regional scale - beyond the rural and urban administrative boundaries, to achieve the objectives of integrated and interlinked rural-urban development. Second, to achieve regional sustainable developmental outcomes, spatial planning tools and processes are of great relevance – however, their application on the ground are often stymied due to a multiplicity of agencies involved.

In recent decades fundamental changes in rural-urban equations have occurred. The result created impacts to global sustainability and the quality of life. The interrelationships between built forms, food security, energy usage, protection of water and other natural resources, and transport systems, the key attributes of a settlement system, were reconfigured due to a rise in population, urbanization, urban sprawl, and consumerist life style. The papers presented by the authors addressed these issues and raised several questions in regards to how to improve:

- existing planning processes to provide for greater economic opportunities and social inclusion?
- livelihood opportunities in rural areas?
- the process of migration to be more inclusionary?
- application of special planning tools?
- preservation of cultures, traditions, architectural characteristics and life styles through the planning process?



Source: Cheri Green: Spatial Targeting and Prioritization of Social Services Investment for Non-Metro SA

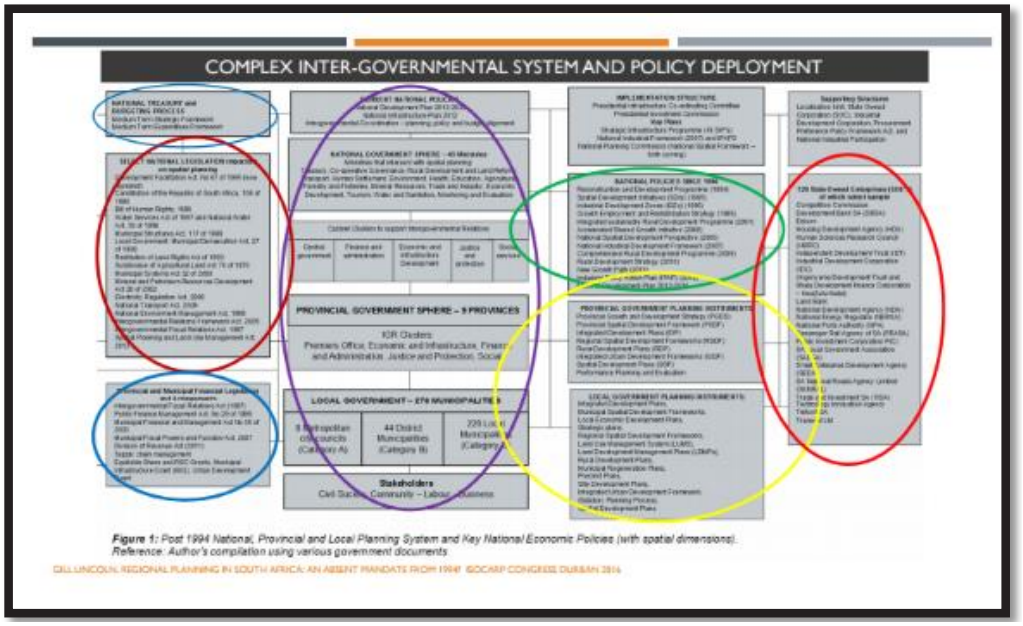


Figure 1: Post 1994 National, Provincial and Local Planning System and Key National Economic Policies (with spatial dimensions).
Reference: Author's compilation using various government documents

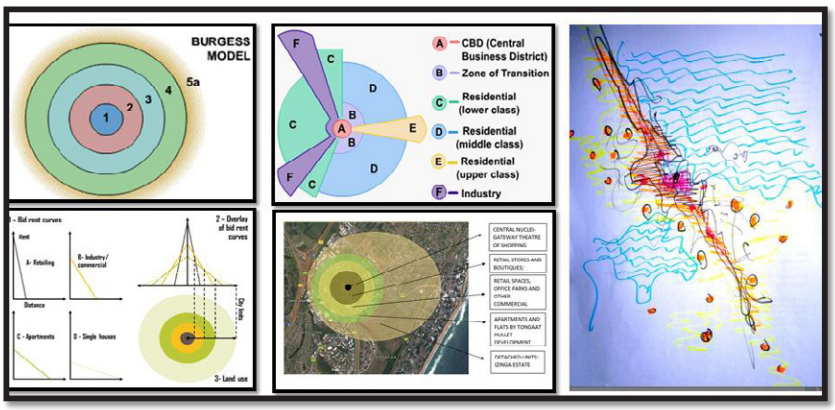
Source: Gil Lincoln: Regional Planning in South Africa: An absent Mandate From 1994?

- livelihood and livability in the peri-urban areas, which are frequently in a state of flux?

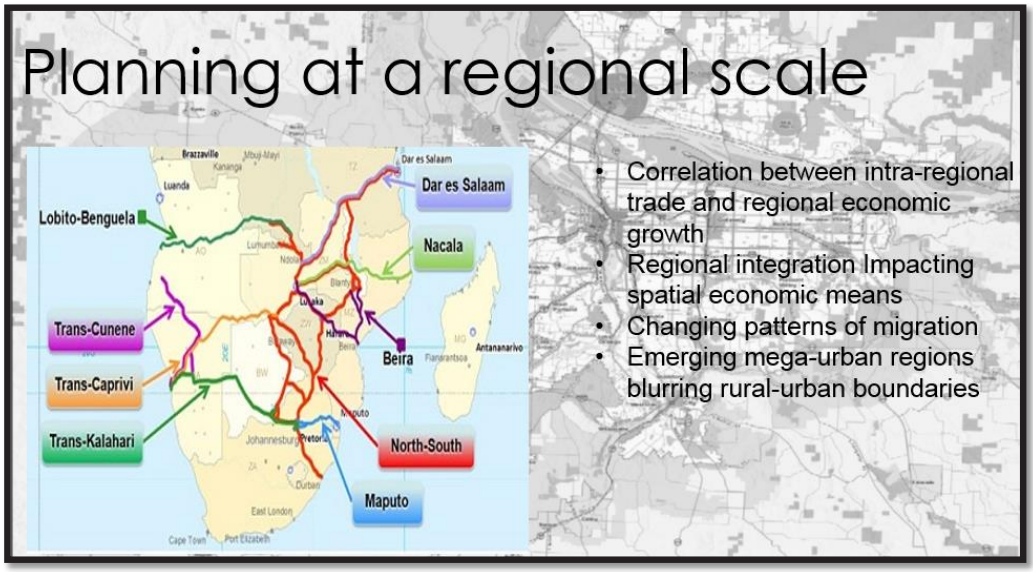
Conventional thinking had equated urbanization with modernization and development, however the rising threat of climate change, environmental conflicts and widening socio-cultural polarization compel us to question such developmental orthodoxies, and direct us to focus on adoption of a more sustainable approach toward urbanization. The research presented in Track 6 suggest adaptation of a new policy regime, to address the unique attributes of rural settlements and economies rather than strive for a complete urban transformation. It was demonstrated how livelihood opportunities in rural areas, could strengthen supply-chain linkages with urban centers, thereby integrating urban and rural settlements. At a national scale, spatial database atlases can help policy makers prioritize investments in depressed regions. At an international-regional scale, development corridors, offer the possibility of tighter regional economic integration between different countries, and leverage development potential of remote regions that are often rich in natural resources.

SOUTH AFRICA PERSPECTIVE

The South Africa perspective considers urban and rural spaces to be interdependent for sustainable development. This is because South Africa has a



Source: Shu Wang: Evolution of Traditional Boat Dweller's Settlements in the Process of Urbanization in Southeast Coastal Region of China.



Source: Gil Lincoln: Regional Planning in South Africa: An absent Mandate From 1994?

repertoire of existing frameworks such as; National Development Plan (NDP) Vision 2030; NSDF (currently under revision); National Infrastructure Plan (NIPs) (2012) through the Strategic Infrastructure Projects (SIPs); Integrated Urban Development Framework (IUDF) (revised 2014), that provide transition opportunities to better integrate rural and urban spaces.

The government's efforts to eliminate poverty and reduce inequality within the population (NDP, 2030), rely on both urban and rural areas to provide the desired opportunities and change (NPC, 2012). The population's migration pattern and natural and economic resources create a dynamic interconnection between these areas (UID, 2014, p. 16). The interdependence of rural and urban spaces is as need develops a comprehensive integrated approach to urban development in response to peri-urban migration patterns (UIDF, 2014, p. 8). As an example chapter 8 of the National Development Plan (NDP), 'Transforming human settlements and the national space economy', presents a vision for urban South Africa:

SOUTH AFRICA GOALS

By 2030 South Africa's goal is to revive rural areas that are functionally integrated, balanced, and vibrant settlements in a meaningful and measurable manner. For this to happen the country must:

- clarify and relentlessly pursue a national vision for spatial development;
- sharpen the instruments for achieving this vision; [and]
- build the required capabilities in the state and among citizens" (NPC, 2012, p. 260).

The policy framework aims to guide the development of inclusive, resilient and livable urban settlements, while squarely addressing the unique conditions and challenges facing South Africa's cities, towns and the rural landscape. Consequently, the NDP recognizes that,

> "[a] fundamental reshaping of the colonial and apartheid geography may take decades, but by 2030 South Africa should observe meaningful and measurable progress in reviving rural areas and in creating more functionally integrated, balanced and vibrant urban settlements' (UID, 2014, p. 12).

South Africa relies on micro-planning to provide rural based and rural livelihood development. Existing established "systems of system planning" interventions in place such as the Agri-parks national project, integrated development plans (IDPs), local economic development plans (LEDPs), Built Environment Performance Plans (BEPPs), Spatial Development Frameworks (SDFs), Land Use Schemes (LUSs) and municipal planning by-laws emphasize a reliance on micro-planning. Local initiatives need to be strongly integrated and connected through regional spatial networks and connections at different spatial levels of scale intervention.

South Africa as a country is excited and aware of the opportunities that advancement in spatial planning tools offer in terms of new possibilities to integrate developmental mechanism at multiple scales of governance. Work, initiatives and interventions in a variety of existing planning frameworks, the National spatial economic opportunity atlas (NSEOA) by the Department of Rural Development and Land Reform (DRDLR), advancement in geo-spatial analysis and

targeting tools by the CSIR, Spatial planning and modelling work by the Gauteng City Observatory Unit, provide ways that advanced spatial planning tools to assist in increasing efficiency and service delivery and improve linkages, market access and flow across the spatial spaces in the Country.

CONCLUSION

The discussions held under Track-6, demonstrate the importance of developing a common spatial planning framework to create greater synergy between rural and urban settlements, and achieve greater synchronization of goals and objectives of the various institutions involved in the regional planning process, and create sustainable outcomes. Findings of Track 6 strongly resonate with the New Urban Agenda, adopted by the United Nations at the Habitat III conference, which reposed faith back on spatial planning, to strengthen the fundamentals of planning – after years of neglect under a neoliberal, market-led development paradigm.

The South Africa perspective reiterates the need to improve the institutional mechanism of coordination, streamline existing governance systems, and build the human resource capacities that are poorly coordinated and instead function as "silo" institutions or departments. There is an effort to close the existing implementation gap still and as the discussions in Track 6 to develop a common spatial planning framework to enable greater synergy between the rural and urban settlements.

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The National Spatial Economic Opportunity Atlas (NSEOA): a tool for trans-disciplinary rural and urban development planning

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South Africa's National Development Plan (NDP) emphasizes the need to transform our national space economy. Achieving this requires an in-depth understanding of the localities of resource and infrastructure endowments, opportunities, needs, current and potential economic activity, and government initiatives. To address these needs and provide the information and data to inform planning, the Department of Rural Development and Land Reform has developed an electronic spatial economic opportunity atlas. The Atlas will also provide a vital tool for all spheres of governance to undertake the activities and produce the plans that are required by the Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA). These spatial planning systems include the National, Provincial, regional, and Municipal Spatial Development Frameworks, and will play an important role in achieving the requirement outlined in Section 9 (2) of the SPLUMA which require national government to improve the capacity of provinces and municipalities to implement effective spatial planning and land use management.

1. INTRODUCTION

The Department of Rural Development and Land Reform has begun a process to develop a Spatial Economic Opportunity Atlas for South Africa, hereafter referred to "the Atlas" which will highlight the role and relative importance that different places throughout the country play in contributing towards the economy. It will provide information on both the current status quo as well as the potential, and will form an important informational basis for the development of the National Spatial Development Framework (NSDF), required by the National Development Plan (NDP). The Atlas itself will assist municipalities particularly in their compliance with the requirements for the Spatial Planning and Land Use Management Act (SPLUMA).

The Atlas will collate existing base information and analyses of growth sectors, threats, opportunities and weaknesses in the South African spatial economy and will present these in an easy to use electronic and internet based system, which will allow for scenario modelling and trend analysis. It is envisaged that the Atlas will also become a portal that will link other relevant economic and spatial information, legislation, policies, plans and relevant initiatives occurring in South Africa.

This initiative recognises the existence of other similar atlases but an area where the Atlas aims to differentiate itself from other economic knowledge products will be its coverage of previously neglected small towns, rural and homeland areas, as well as the bigger, more developed parts of the country.

2. POLICY FRAMEWORK

2.1 Rationale for the development of the atlas, benefits and opportunities

One of the primary aims of the Atlas is to provide the base information for the development of the NSDF, identified in both the NDP and the SPLUMA to address spatial inefficiencies and inequalities, identify areas of opportunity and ensure proactive management of natural resources and ecosystems.

2.1.1 Towards the development of the NSDF

The NDP emphasises the need to transform our national space economy. Achieving this will require an in-depth understanding of the localities of resource and infrastructure endowments, opportunities and needs and current and potential economic activity. The Atlas will provide the information and data to inform this.

The functions that the NDP lists for the NSDF are indicative of the information that the Atlas will need to provide:

- For the NSDF to tackle spatial divisions, it will need to be informed about current spatial patterns of access and deprivation.

- To unlock development potential it will need information on areas that are, and are not, growing economically, which lack infrastructure, skills, innovation or governance capacity. These will demonstrate where investment in economic and social infrastructure and institutional support should be targeted.

- To guide and inform infrastructure investment and prioritisation, the Atlas will inform the NSDF by providing information on the location of current infrastructure as well as an understanding of where new infrastructure should be developed.

- To manage contemporary economic and demographic shifts, the Atlas will provide the NSDF with information on economic dynamics, including where there is potential to concentrate activity whilst balancing the need to avoid congestion.

- To allow the NSDF to facilitate the coordination between government and other agents, the Atlas will provide a common reference point for uniform geo-spatial information.

2.1.2 Implementing SPLUMA

The Atlas will also provide a vital tool for all spheres of governance to undertake the activities and produce the plans that are outlined in SPLUMA and will play an important role in achieving the requirement outlined in s. 9 ss. 2 of the Act which requires National Government to improve the capacity of provinces and municipalities to implement effective spatial planning.

The Atlas will be an important resource for all spheres of government in their development of Spatial Development Frameworks (SDFs) and Integrated Development Plans (IDPs) in providing multi-sectoral spatial development information including information on previously disadvantaged areas, rural areas and areas under traditional leadership, identifying historical spatial imbalances in development and providing direction for strategic developments, infrastructure investment and priority areas for investment in land development.

Towards these, the Atlas will play a major role in enriching plans so that the principles of spatial justice, spatial sustainability, efficiency, spatial resilience, and good administration outlined in SPLUMA can be reached:

- Spatial Justice: The Atlas will identify areas of poverty and deprivation as noted in Section 7 (a)(ii) of SPLUMA, and provide data informing how they can be appropriately addressed (SPLUMA Section 7(a)(iv));

- Spatial Sustainability: The Atlas will identify prime and unique agricultural land as required in Section 7(b) of SPLUMA; environmentally sensitive land; and inform decisions on sustainability;

- Efficiency: Through identifying existing resources and infrastructure, the Atlas will allow for their optimal use (SPLUMA 7 (c)(i)) and will inform and speed-up decision making to mimimise any negative impacts of development.

- Good Administration: By providing shared information in a transparent form for all spheres of government to use in their planning and analysis, the Atlas will contribute towards principles of integration and good administration.

3. TOWARDS REALISING ECONOMIC OPPORTUNITY

Although 'economic opportunity' is a widely used term, its meaning is not always clear and in different contexts it may have different meanings. Basically however, identifying an opportunity is about identifying the set of circumstances that makes it possible to achieve a particular goal.

The important thing however is to recognise that opportunity means different things to different people and different sectors. There is no one set of favourable circumstances, but instead a infinite series of combinations of circumstances which would represent different opportunities to different people at different times. A further important factor is, given a set of favourable circumstances, there are again, infinite ways in which we can make use of them to different ends.

3.1 Understanding the type of economic opportunity to be identified

A key issue then is understanding what we are trying to achieve. What sort of opportunities should the

Atlas identify? Here the NDP (Department: The Presidency, 2011) provides guidance, and lists the key elements that must be achieved in transforming the economy: "South Africa needs an economy that is more inclusive, more dynamic and in which the fruits of growth are shared equitably. In 2030, the economy should be close to full employment, equip people with the skills they need, ensure that ownership of production is more diverse and able to grow rapidly, and provide the resources to pay for investment in human and physical capital" (NDP Department: The Presidency, 2011)

The NDP recognises that this should be done through a focus on the following:

- Increasing exports, focusing on those areas where South Africa already has endowments and comparative advantage, such as mining, construction, mid-skill manufacturing, agriculture and agro-processing, higher education, tourism and business services.

- A more efficient and competitive infrastructure. Infrastructure to facilitate economic activity that is conducive to growth and job creation. An approach will be developed to strengthen key services such as commercial transport, energy, telecommunications and water, while ensuring their long-term affordability and sustainability.

- Reducing the cost of living for low-income and working-class households. Inequality and poverty can be addressed by raising incomes through productivity growth and reducing the cost of living. A commitment to a minimum living standard will ensure that all households can meaningfully participate in the economy. The costs of food, commuter transport and housing must be reduced, while raising the quality of free or low-cost education and health care.

- Reduced cost of regulatory compliance, especially for small- and medium-sized firms.

- A larger, more effective innovation system, closely aligned with firms that operate in sectors consistent with the growth strategy.

- Support for small businesses through better coordination of relevant agencies, development finance institutions, and public and private incubators.

- An expanded skills base through better education and vocational training.

- Strengthened financial services to bring down their cost and improve access for small- and medium-sized businesses.

- A commitment to public and private procurement approaches that stimulate domestic industry and job creation.

- A higher rate of investment, with public sector investment crowding in private investment. This will depend on partnerships with the private sector, policy certainty and building confidence in the long-term growth of the economy.

- A labour market that is more responsive to economic opportunity. This requires lifelong learning and career advancement; stabilising the labour environment; strengthening dispute resolution institutions; reviewing regulations and standards for small and medium enterprises; addressing public sector labour relations; strengthening the application of minimum standards among employers, recruitment agencies and brokers; strengthening active labour market policies and labour matching; and enabling skilled immigration.

- Enhanced commercial diplomatic services to support the expansion of South Africa's global market share.

4. SPATIAL PLANNING AND ECONOMICS

It is pertinent to consider the question of how spatial planning and land use planning in South Africa can and do (or do not) support and encourage a vibrant local economy.

The approach followed a case study on a spatial development framework to illustrate a variety of plans in relation to the economy, and finally a summary of issues.

4.1 Municipal spatial development frameworks – illustrative case studies

A case study of iLembe SDF is set out below, with a view to determining the influence these plans have on economic development in the municipality concerned, and how it may inform investors and other role players. These issues are important in the development of the Atlas in that they provide valuable information on the type of information and focus the Atlas should include to better inform the

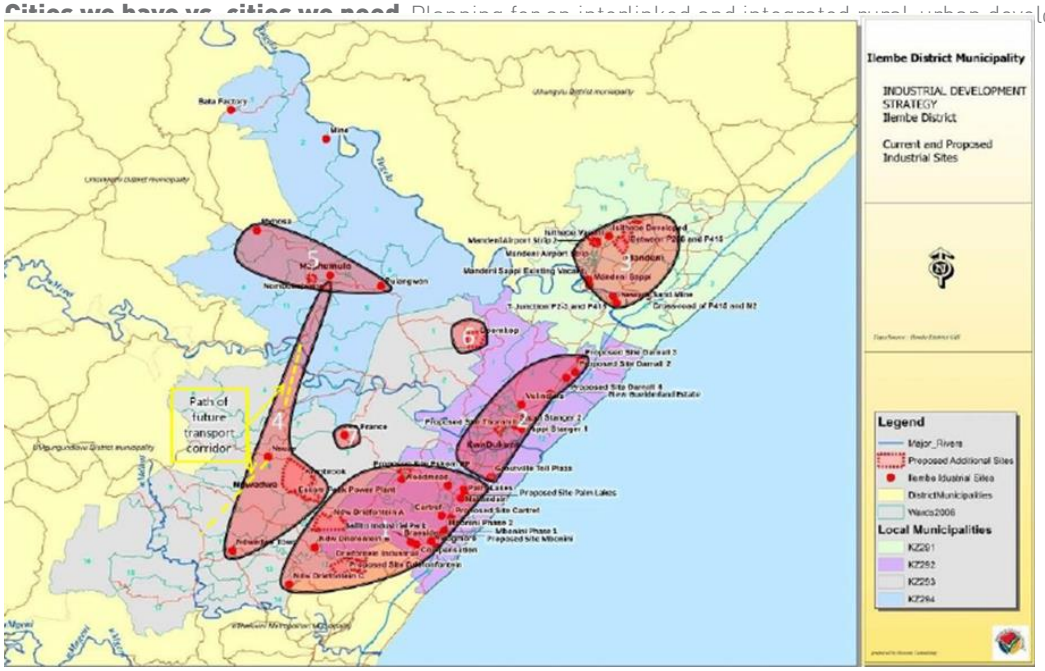


Figure 1: Ilembe industrial development (Source: Ilembe SDF Review 2015)

economic imperatives of SDF's.

A number of questions can be posed:

- In what way do the plans give direction to economic development?
- Do the plans present opportunities for development?
- Do they indicate where and what new significant infrastructure may be developed in the near future?
- Is there an indication of where markets are located, and what thresholds are suggested?
- Is there evidence of an integrated approach, involving different line function departments?

4.1.1 Ilembe District Municipality spatial development framework

The iLembe District Municipality Spatial Development Framework Review (2015) presents a high level overview of the district municipality providing socio-economic data such as levels of income and education, which do not appear to inform the SDF proposals in any way.

The economic analysis of the district is thin, and very generalised. For example, there is an assumption that the industrial complex of Isithebe (which was originally conceived as a "border industry", typically separated from the main urban centres to achieve the aims of apartheid), will continue to grow in its relatively isolated location in the north of the district. The prospects of its growth or decline, and which sectors it is intended, or likely, to serve are not discussed. There is a note towards the end of the report calling for increased incentives.

The "industrial development" depicted in the diagram below includes a number of smaller areas of "proposed additional sites". Firstly, it is not clear what the envelope shapes are intended to depict, and secondly there is no discussion in the document about the proposed location, size or function of the proposed new industrial sites, nor how they will relate to other urban areas, or supporting facilities. Also, there is no indication of linkages to residential areas.

The SDF states that the District is envisaged to attract investment for industrial development through the promotion of spatially defined industrial clusters. Ballito will be a site for light industry, KwaDukuza will support medium sized industries and Mandeni and Isithebe will cater specifically for heavy industries. Together they will form a thriving manufacturing inland corridor. It is reordered in the iLembe District Spatial Economic Development Strategy 2013, that excess demand will be catered for westwards along the R614 and R74. Light manufacturing will also occur as value adding to the reconstructed agricultural activity in the hinterland" (iLembe SDF, 2015).

It would be important in the SDF to indicate how this should be achieved, and what conditions need to be met for these ideas to materialise.

The SDF states that "apart from the identified nodes, the SDF must further identify strategic investment areas which are areas that are not necessarily nodes

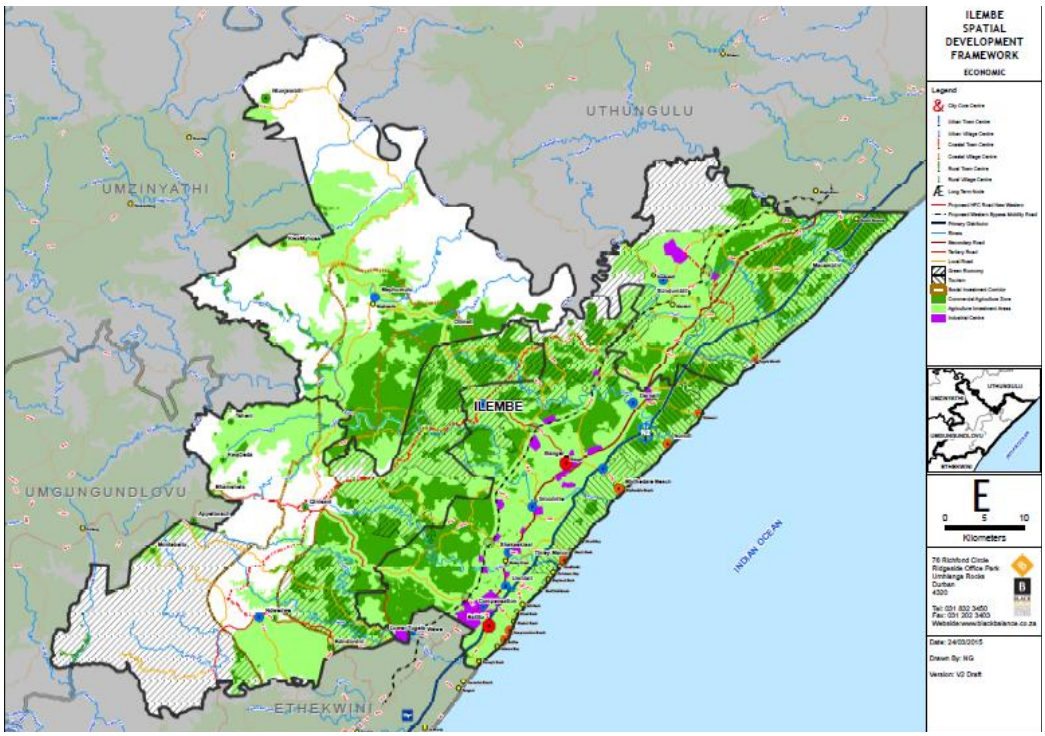


Figure 2: Ilembe economy (Source: Ilembe SDF Review 2015)

but do possess unique characteristics and may be used as positive spin-offs. The strategic investment areas may be industrial areas such as iSithebe and Sundimbili, tourism areas, manufacturing focused regions. These are also areas that need to be prioritised in terms of infrastructure and investment" (Ilembe SDF, 2015).

In the "Economic" map shown below in figure 2, areas where certain economic activities and sectors are expected to be established (or, possibly – are being directed to establish here?).

The light green denotes "Agriculture Investment Areas", and the darker green denotes "Commercial Agriculture Zone". It is not clear what the distinction between these two is meant to be, nor what the purpose of this distinction may be.

"Tourism", shown in a hatch overlay, and located between the national freeway and the coast all the way from the district's southern boundary to its boundary with uThungulu District Municipality. This is a somewhat simplistic rendition of tourism potential.

Likewise, the "Green Economy" zone, generally located in the western part of the Municipality, and covering both the green and white shades on the map, do little to indicate what is intended.

In a generalised manner, the Ilembe SDF sets out its plan for economic development as follows:

"Spatial Economic Development – identifying and mapping out key strategic regions for various economic sectors such as tourism, agriculture and mining will begin inform the strategies for each of those regions required to unlock the potential of the identified economic sectors. Determining the economic drivers has been based on an analysis of the existing economic make-up of Ilembe, in terms of both existing economic activity and the economic potential development of Ilembe's context – the Province of KwaZulu-Natal, South Africa and by implication the District's place and possibilities in southern Africa and the world. The term "economic drivers" refers to the standard economic sectors as commonly understood and also to the clustering of a range of sectors, sub-sectors or value-chains.

In the analysis to date, three key economic drivers have been identified as follows:

1. Agriculture:

- Identification and secure of high potential agricultural land in traditional council areas
- Establishing agri-hubs in appropriate locations throughout the District
- Facilitating market production

2. Tourism:

- Wildlife routes, incorporating the mass ecotourism destinations

as well as coastal routes.

- Angling Route, incorporating top recreational fishing spots e.g. and other popular fishing destinations.

- Zulu Cultural Heritage Route, incorporating Kwadukuza and Mandeni specifically.

3. Industrial Sector:

- The municipality should provide incentives for industrial development in terms of availability of land.

- Should declare Isithebe as an Industrial Development Zone and develop a marketing strategy to attract potential manufacturing/ industry into the area.

- Utilise natural resources for industry such as indigenous wood for furniture and provide support to local entrepreneurs first as well as monitor BEE components at district and local level (iLembe SDF, 2015).

The concluding spatial framework shown below in figure 3 does little to guide either public or private investors. There is a proposed western bypass "mobility" road, running parallel to, and lying west of the R102. This has not been discussed or motivated in the report, nor how it will influence spatial structure or development. The blue and yellow colouring denotes the anticipated or planned massive spread of "urban village" and "rural village" respectively.

The "priority infrastructure routing" shown in shaded tone along the main movement routes throughout the District sheds little light on the priorities for development, and may easily interpreted as maintenance requirements for the District.

In summary, this SDF does little more than depict the status quo, except for the massive anticipated urban growth along the coast, and to a lesser extent along parts of the district's western boundary. In the demographic projections to 2030 and 2050 presented in the report, it would appear that the population in the District could be expected grow by approximately one fifth of its present size by 2030. There appears to be a mismatch between these figures and the size of urban expansion shown here.

5. OVERVIEW OF FACTORS TO BE INCLUDED IN THE ATLAS

South Africa's economy has a marked duality, with a sophisticated financial and industrial economy having grown alongside an underdeveloped informal economy.

For the purposes of the Atlas, the following factors have been identified to be included in the Atlas

1. Economic and Financial Factors

2. Governance

3. Human/ Social factors

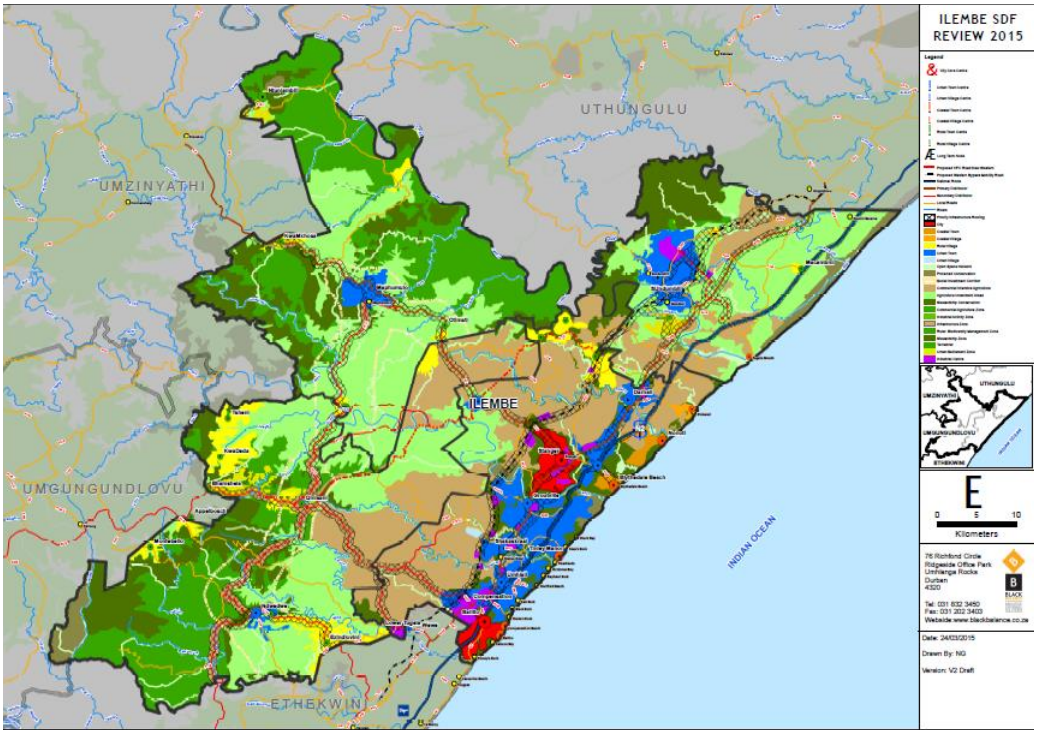
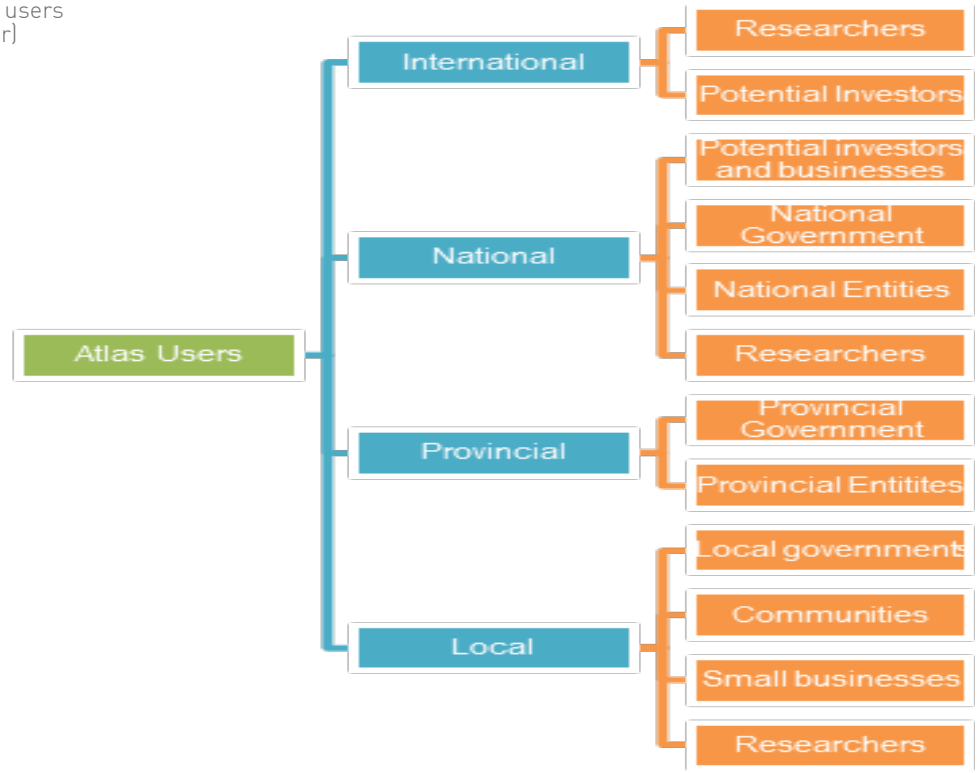


Figure 3: Ilembe spatial development framework (Source: Ilembe SDF Review 2015)

Figure 4. Atlas users
(Source: Author)



4. Capital resources – Infrastructure

5. Environmental factors – climate change, global warming, water shortages

6. Output

7. Critical cluster and sectoral data (ei, Mining, Agriculture, Tourism, etc)

Mapping the factors and identifying the sectoral opportunities, overlaid by the state of the natural assets may provide a clearer indication of the potential for economic opportunity in specific areas.

6. FOCUS ON THE NEEDS OF FUTURE ATLAS USERS

It is envisaged that the Atlas will be used by users as identified on Figure 4.

7. CONCLUSION

The National Spatial Economic Opportunity Atlas will be developed on the backdrop of the National Development Plan which emphasizes the need to transform the complex and disjointed spatial patterns inherited from South Africa's past spatial planning systems and identify and capitalize on economic opportunity to encourage economic growth that will result in the development of disadvantaged communities. The main aim of the Atlas is to ensure the implementation of the Spatial Planning and Land Use and Management Act 13 of 2015 by supporting the development of the National, Provincial, Regional and Municipal Spatial Development Frameworks. The Ilembe SDF case study clearly demonstrates the lack of effective direction in the identification of economic opportunities in the area which do very little to guide potential public or private investment. Therefore, the Atlas will not only provide the status quo of such areas but assist the municipalities and a variety of other users to identify areas of economic potential in urban and rural areas for development. Key to this is ensuring that the Atlas spatially illustrates context, status quo, spatial priorities, trends and opportunities.

Therefore it is essential that the Atlas is a valuable product, it will be closely tailored to the needs of its users, will be technically robust, its data will be accurate and up to date and the broader system sustainability will be considered during the development of the system.

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Using catchment area analysis and GIS based spatial analysis for prioritising spatial investment in non-metro South Africa

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In the search for greater equity, spatial justice and efficiency of service delivery, the concepts of central place, agglomeration, and accessibility, together with GIS principles of catchment analysis, were applied to develop service catchments for social facility provision. A geo-spatially targeted hierarchy of places was also identified to prioritise investment of regional middle-order facilities in "Service Malls" located in the most optimal towns to best serve non-metropolitan areas in South Africa. This paper outlines the background, principles and process applied. Delivery of social services in rural South Africa remains a major challenge twenty years after the demise of apartheid. Challenges include the poor planning and allocation of facilities; processes which are vulnerable to politically based decision-making.

The identification and profiling of service catchments seeks to support a more structured and equitable allocation of resource, while the identification of prioritised town points enables targeted social facility investment for the allocation of middle-order social facilities in non-metro areas. The latter aims to achieve a more spatially balanced, sustainable and efficient allocation of services, meeting the needs of both users and service providers and serving the largest number of people from the least number of service points, in line with the principles of equity, government policy and fairness.

The catchments and prioritisation form part of a larger research project focused on the consolidation and differentiation of provision standards to guide social facility development and investment in mainly rural areas.

A key finding was that, if a spatially targeted investment strategy was used for locating middle-order services, it can halve the number of potential service points required while still providing services within acceptable travel distances, to over 90% of all citizens. This could have a major impact on the rationalisation of services and the more efficient allocation of resources.

1. INTRODUCTION

In a search for greater efficiency in service delivery, the concepts of central place, agglomeration, settlement hierarchy and facility planning theory, accessibility and principles of GIS-based catchment and optimisation analysis were collectively applied to develop a geo-spatially targeted set of service points that eliminate the spatial overlap of service areas for middle-order services. The paper outlines the development of this geo-spatially targeted nodal hierarchy that can be used to prioritise investment of regional middle-order services (preferably in "Service Malls") in the most optimal towns to best serve non-metro South Africa.

The analysis outputs used to illustrate the work here are part of a project to develop differentiated provision standards for social facilities for a range of rural planning contexts that have been linked to a profile of service catchments for all areas in South Africa. In the sections that follow key issues are outlined, and the theoretical framework for defining the service catchments explained. The paper briefly touches on the development of service catchments undertaken before the eventual identification of the geo-spatially prioritised set of proposed investment nodes. It describes the processes used to develop the prioritised approach to middle-order social facility services nodes. Such nodes should comprise key facilities for transacting life, such as 24-hour health services, citizen registration, police services and application for social grants.

The paper briefly touches on the range of economic and planning frameworks that underpin the research approach.

2. PRINCIPLES AND LITERATURE

2.1 Provision of social services in South Africa

The South African constitution provides for each citizen to have access to basic services. In this respect, it has become a legislated requirement that local authorities in South Africa prepare Integrated Development Plans to promote consolidated and informed development as well as deliver services. Constitutionally, South African citizens have entrenched rights to access to healthcare and social security amongst other factors (Section 27 of the Bill of Rights). This is in line with the Integrated Urban Development Framework (IUDF 2016). Sustainable Development Goals (SDG) and the National Development Plan 2030 (NPC 2012), which requires that by 2030 South Africa should have made meaningful and measurable progress to reviving rural areas and creating more functional, integrated, balanced and vibrant urban settlements.

If essential services are not made accessible to all communities, even the most remote, these community members will be unable to make such vital life transactions as obtaining legal status as South Africans or residents (registering births and deaths, obtaining identification documents), accessing health services, regional-level justice facilities (courts) and grant application offices, and so forth. Such services are required to promote full productive lives, improve standards of living, and obtain social support when required to truly benefit from the vision of the new democracy. Currently, the delivery of social services is unequal and remains a major challenge even twenty years after the demise of apartheid, and especially in rural South Africa. Challenges include poor planning and the misallocation of facilities through politically biased decision-making. Owing to the complexity of the development landscape it is not suitable, neither is it sustainable, to provide the same level of services to all areas of the country. Given that departments and municipalities have limited resources to provide services to citizens, the ultimate goal is to ensure – within the parameters of sustainability – that all citizens at least have minimum access to key citizen services from the least number of service points while still meeting population service thresholds and distance requirements, considering settlement patterns, and avoiding the development of 'White Elephants".

There are currently limited universally legislated access norms and standards to guide the development of government provided social and other facilities in rural South Africa. Experience with applying facility standards has highlighted the important role played by the context of local areas and it is widely accepted that not all services can be provided at all places. Some service types have higher population thresholds and a wider service reach with longer acceptable access distances and facilities provide different levels of service, e.g. regional versus local services. Therefore, services of different levels need to be distributed in different ways and provided at different levels of settlement based on minimum population numbers for them to be feasible, equitably distributed and optimally utilised. It would thus be inefficient to provide the same level of service in all areas of a country irrespective of the area context (population densities and types of development are important factors to consider).

Past projects for the Department of Public Service and Administration, City of Cape Town and City of eThekwini amongst others (Green et al. 2012b; Green et al. 2010b; Green et al. 2010a) have proved that accessibility analysis is an extremely useful tool to sustainably locate facilities in a way that incorporates principles of access distance, service threshold and centrality. However, this process would prove very time consuming and costly if it were to be undertaken on a national level. The demand on skilled resources required would also make this impractical; thus, in 2013 the CSIR embarked on a process aimed at applying principles of accessibility planning for social facility location on a national level which would be less data intensive. The approach used was to develop a spatial logic for the efficient and equitable allocation of a range of different social facilities that incorporated the principles applied in the GIS-based accessibility planning but without the necessity to have access to the current facility supply data. This led to the development and profiling of service catchment areas around existing nodes of various levels with the aim of establishing a hierarchy of service points for South Africa that could be used as the basis for the planning of different levels of facility provision.

2.2 The role of central places in rural development

Walter Christaller introduced the concept of Central Place Theory in 1933 to explain the spatial arrangement of the number and size of settlements. Although Christaller's assumptions regarding an isotropic surface and evenly distributed population

are mostly invalid for South African conditions, where densely populated settlements often manifest outside key towns, his concept of a central settlement providing services to those living around it remains universally valid irrespective of different density types. The theory consists of two basic principles: that of threshold (minimum population required to provide goods or services at a place); and, the range or maximum distance people will travel for services (Christaller 1933). The latter is often referred to as the sphere of influence.

Accessibility analysis for facility location planning has incorporated and is dependent on two economic mechanisms, namely range or access distance and threshold; both of which are part of Central Place Theory. The first of these two major components refers to the ability to reach a facility using available and affordable transportation; the second, to the ability to be able to utilise a service which has adequate capacity. The ability to reach a service is generally governed by a willingness on behalf of the potential user to pay for the trip in terms of time and/or money. In reality, this mainly translates into a maximum distance people are prepared to travel, after which the cost of travel exceeds the usefulness of the service to be received and the trip is foregone. The introduction of the concept of range/distance to the provision of social facilities introduces a spatial dimension in planning in terms of the location, distribution and spatial organisation of services. This spatial perspective supported by GIS analysis has proved a robust approach for locating and planning social facilities.

Some important definitions:

Threshold is the minimum market (population or income) needed to bring about the selling or provision of a particular good or service. In the provision of communal free services, the minimal value will not be measured in respect of income or profit but will relate more to the efficiency of providing the service to at least a minimum (viable) number of clients;

Range (access distance) is the maximum distance consumers are prepared or able to travel to acquire goods/ services since at some point the cost or inconvenience will outweigh the need for the good/service.

2.3 Approach & methodology

2.3.1 Principles of hierarchies in service delivery

As indicated, different services or service offerings have different operational requirements and population thresholds that make a service viable from a service provider perspective. Users are willing to travel different distances to address different service needs depending on the frequency at which the service is required, as well as the value of the service to the user. These principles form the basis of facility provision standards which need to be incorporated as input parameters into models designed to support the accessible planning of facilities. For some of these, legislated guidelines are provided; others have evolved though practise or trial and error. To undertake the catchment demarcation, a clear understanding of the typical access and threshold values for different services was required.

When one considers facility planning thresholds and access distances, it is clear that different facility types can also be grouped based on their having similar threshold and/or access distances and that these can be broadly divided into three categories of services: low-order basic services; high-order services; and, those in between, that form the 'middle-order' facilities. Low-order facilities that serve a fairly small number of people and are accessed frequently, such as schools, should be located as close as possible to all communities of minimum size, while middle-order facilities, such as 24-hour clinics and Home Affairs offices, that serve a higher threshold of people but are used on a much less frequent basis can be located at further spaced intervals in more established places. Higher order facilities, such as universities and large hospitals, can be spaced even further distances apart and require many more people to be sustainable.

This hierarchical nature of social service delivery can ideally be linked to a hierarchy of centres that clusters social facility provision such that the widest possible area and highest number of people are served. The establishment of a hierarchy was thus considered a logical spatial structure for equitably allocating facilities of various types to different levels of catchments/settlements.

2.3.2 Planning for the location of communal services and economic geography

It is not possible to rely on the market to regulate the distribution of social facilities, especially in sparsely populated poverty ridden areas with limited demand, and thus the welfare approach is appropriate for the provision of social services in South Africa. Smith (Amer 2007) presents the key concept of the welfare approach as being "who gets what, where and how",

which provides the fundamentals of facility planning for most services irrespective of income. The "what" refers to the service provided and the "where" to the concept of spatial variation, whilst the "how" refers to the broader social and political functioning. A fundamental issue in respect to facility location is the population that the facility will serve ("who"), as well as a good understanding of "where" this population lives, how they are distributed and what their profile is. By looking at the "who", planning for a specific target group based on the threshold, and by examining "where" demand is located relative to facility location, and by setting a maximum access distance, time or cost limit, a certain level of equity and balance in service provision can be achieved.

In understanding the "where" of facility location, one can look to economic location theory. The theory assumes that both suppliers and users will tend to minimise their costs and that the service/ outlet will be located "where" the provision of goods and services, including transport, is optimised. Thus, travel or access distance is critical in facility location planning. People live at different densities and at different distances from facilities and their reasons for selecting a facility may include a range of factors. However, by introducing the concept of facility thresholds and applying similar threshold (or population ratios) relative to facility size and similar distance limits it is possible to work towards broader equity across a region for the "what", i.e. the service being provided. This is true even if some citizens choose to make alternative choices based on various social, economic and cultural factors or perceptions as well as the available public transport options. Modelling or planning facility location based on the assumption of informed citizens making a rational choice to visit the closest facility may not always be universally realistic; however, when applied at a strategic level such an approach can provide informed decision-making to achieve potentially greater equity in meeting service delivery backlogs.

Demand targeting and estimation in the provision of social facilities is critical for correctly calculating the size of the service while cultural, economic and social factors in facility use are also important considerations. A key output of the research undertaken was to demarcate and profile 'wall-to-wall' service catchments and to calculate the demand within each service catchment, as well as within a specific distance of the central node of each catchment, to gain a better understanding of "where" services are needed and can best be located. To this end, a critical component of the project was to develop a clear understanding/description of the different service catchments including their settlement morphology, which is the subject of a separate paper (Sogoni et al. 2016).

2.3.3 Spatial equality and social well-being/ quality of life

In the provision of services, citizens should as far as is possible not be discriminated against because of where they live. Irrespective of where people choose to live (within reason), the right to access certain basic services needs to be recognised and some effort made to provide access (even if infrequently/ periodically) within the restrictions of the available funding. The issue remains that the more sparsely populated an area is, the more difficult and costly it proves to provide communal services and, in some cases, mobile, periodic or electronic based services are the only options. Discrimination based on gender, creed or race is not acceptable, and it is argued that so too is discrimination based on place of residence (Amer, 2007). Smith (1995) also highlights the need to achieve social justice within the spatial and geographical arena.

3. OBJECTIVES/ RESEARCH QUESTIONS

As the free market cannot successfully regulate the distribution and provision of social facilities and there are insufficient funds to provide all the required facilities in every settlement in a developing country such as South Africa, choices need to be made as to which locations to service first and which to develop later when funds become available or the population grows. It can also be rationally argued that within the context of budget constraints, services should be provided where they can have an impact on the largest number of people (Green et al. 2008) and, therefore, the identification of those places of greatest need and accessibility to residents should be prioritized for investment.

Thus, the identification of a prioritised hierarchy of places – as discussed in this paper – that can be used as a means of spatially targeting the largest number of people from the least number of service points is important.

4. APPROACH & METHODOLOGY

4.1 Analysis approach

In the project, two levels of analysis were followed. The first was to demarcate catchments based on centrality to central places and then to profile these based on a range of relevant planning parameters. Following which they were ranked based mainly on

their settlement typology and population. This then informs and defines a minimum basket of services for each level of catchment under the assumption that all identified services can be met. The second analysis looked at how best to target investment by the optimal provision of service access to a basket of middle-order services. Middle-order services have an access reach of approximately 30km and the goal was to find the lowest number of optimal locations to service at least 80% of the population with a middle-order package of critical services. The latter approach is intended to support the development of sustainable service delivery networks in an environment full of pressures, relating to insufficient resources to deal with the extent of the development challenges and competing political and administrative priorities.

4.2 Creating the catchment hierarchy

To support the differentiated and appropriate provision of facilities for different contexts, the service catchment approach (Green et al. 2012a) was used to allocate and define all areas of the country into appropriate service catchments. After this, the hierarchical concept was used as the building block for drawing up facility provision packages and their allocation to the different levels of catchment.

Making use of advanced GIS spatial allocation models, it is possible to undertake, from a strategic perspective, a national/regional analysis of demand (population distribution) and potential supply points (town points) linked via the transport network. Such models are very useful for balancing and planning facility capacity within a region or area to achieve spatial equity and social justice. These tools were applied to demarcate service catchments for social facility provision for all areas outside the metropolitan areas using accessibility/central place principles. Service catchments for South Africa were developed around the 1 328 nodal places of different sizes and settlement morphology that had already been identified for South Africa (stepSA 2016). For this process, the country was divided into 1km2 grid cells and these units were used to allocate all areas, and by implication their population, to one of the classified settlements. A detail dwelling frame dataset was used for the purpose of assigning the population to each grid cell and then using this to aggregate the population to the defined catchments.

The classification and profiling of an extensive range of settlement and development contexts as they occur outside of the metros is critically important in understanding how much, where and how facilities should be distributed within catchments. The profiling identified a vast range of diverse settlement contexts which proved difficult to classify into a usable number of types; however, the profile of each catchment does provide significant detail to better inform the facility location within each catchment. The diversity of South African contexts also means that local adaptations are required in each instance. The profiles of the catchments cover a range of factors including population size, density, area, administrative role, economic production measured through Gross Value Addition (GVA), settlement morphology and topography, nodal level, and information on travel distances to other settlement levels. The settlement morphology within each catchment is considered to be a key informant to the final number, size and distribution of services within each catchment.

To ensure the sustainability of services and their effective provision, the location of services at key points of accessibility and centrality is critical. The first approach was to develop a 10-level hierarchy. The hierarchy has certain links and relationship to the CSIR/SACN typology of settlements for most of the higher order places, while the catchments of lower order places were mostly ranked according to population size. The reason for this is that population demand is the single major factor together with distance affecting the efficiency and viability of services.

The nodes of the first four catchment orders (1–4) are considered to be developed middle to higher order settlements or, in the case of some order 4 nodes, to at least be the most significant place within more remote/sparse regions. The classification of Levels 1 to 3 and most selected level 4 nodes is based on the SACN/CSIR Typology (stepSA, 2016). The aim was to ensure that in most areas of the country there is at least one level 4 (or above) catchment node within a reasonable distance at which to locate middle-order facilities. (The definition of reasonable is context specific given that in the more arid western regions of the Northern Cape 80km may be reasonable while the distance is seen as excessive in more densely populated parts of the country.) Catchments of Levels 5 to 10, in comparison to the higher catchment levels, have less economic functionality/concentration or contain fewer people.

The alignment of the different facility thresholds (the number of people or the size of a community to be supported by a facility) and the appropriate access distance to reach a facility was used as input to the development of the catchment hierarchy bands. Some of the key threshold values for selected

services (e.g. a 1 000-person threshold for schools, a 5 000-person threshold for a fixed 5-day a week clinic, and a 20 000-person threshold for a Home Affairs office) informed the number and range of catchment levels defined. By understanding the frequency of service use and typical acceptable travel distances for different services, and using the key parameters of service threshold and access distance of selected facilities, it is possible to group different facility types and to link these with catchments of similar thresholds. The creation of a hierarchy of catchments thus forms an important regulating system for the equitable and efficient distribution of services.

5. RESEARCH ANALYSIS & FINDINGS

5.1 Research analysis

An evaluation of the number of people by each catchment category confirmed the concentration of people in the higher order catchments, with over 50% living within the influence sphere of a metro, city or regional service centre. There is also a clear predominance of non-metro catchments which have concentrated settlements and which display a clear nodal structure in the South African settlement morphology, thus reinforcing the use of town points as focal areas for middle-order service location.

Since the key focus of the main project was on differentiated service provision levels to support the application of standards in rural areas, service packages linked to the typical threshold values were developed for each level, with allowance for extra services in more remote areas or adjustment of the package based on the morphology. For effective application of the standards packages, an understanding of the internal settlement morphology of the catchment is vital. The morphology and its implication on service distribution networks has been addressed in a paper by Sogoni et al. (2016) as well as through the development of project related application guides.

The provision standards are focused on aspects of access and threshold in relation to a range of functional service areas rather than facility design and structural elements. Service provision packages were drawn up based on the crucial concept of providing a minimum of key services to transact basic life requirements. If these essential services are not accessible, community members will be unable to make such vital life transactions as birth registrations, and obtaining access to grant, education and health services. These key services thus form the basis of any service package offered to a community. Depending on the size of communities and their location and distribution, the service packages will provide different levels of service specialisation or frequency of use.

To further evaluate service access provision and support planning of middle-order services such as 24-hour clinics and citizen registration services, a travel distance and density analysis was undertaken to test the centrality of all town points at the centre of the catchments. The analysis focussed on the 30km distance range. The reason for this is that, based on the most commonly provided middle-order services, there is a clear convergence of distances between several services as indicated below:

- 15 to 24km – police stations, FET colleges and community halls in a rural context;
- 25 to 30km – Home Affairs offices, Department of Labour offices, multi-purpose centres/ Thusongs, SASSA offices, hospitals or community health centres depending on density.

Many of the above social facilities form the core of the so-called "Social Services Mall" concept where middle-order services, that are considered to be critical for all citizens, can be clustered together in close proximity or even under one roof in a Thusong or multi-purpose centre.

Typically the service offering of such middle-order facilities can be incrementally increased based on the elasticity of demand, thus no maximum threshold of people to be served was applied. The 30km distance was selected as an appropriate structuring mechanism for most parts of the country for distribution of middle-order services. In sparse areas in the western part of the country (less than 10 person/km2), this distance was extended to 50km to support service viability and cost-efficiencies in low density contexts. The examination of service statistics show that at the 30km (or 50km in sparse areas) distance these services would be accessible to 91% of the population if services were non-selectively placed in all catchment nodes of Levels 1 to 7 (535 places). Catchments of Level 7 and above all contain at least 20 000 people. To achieve a 95% coverage of middle-order service to all catchments with at least 10 000 people (thus including Level 8 catchments) in a non-spatially selective manner would require that 805 service catchments be provided with services. This may result in overlapping service areas in some instances where towns are close together. Such an approach requires significant cost, management and logistics to support the large network of services.

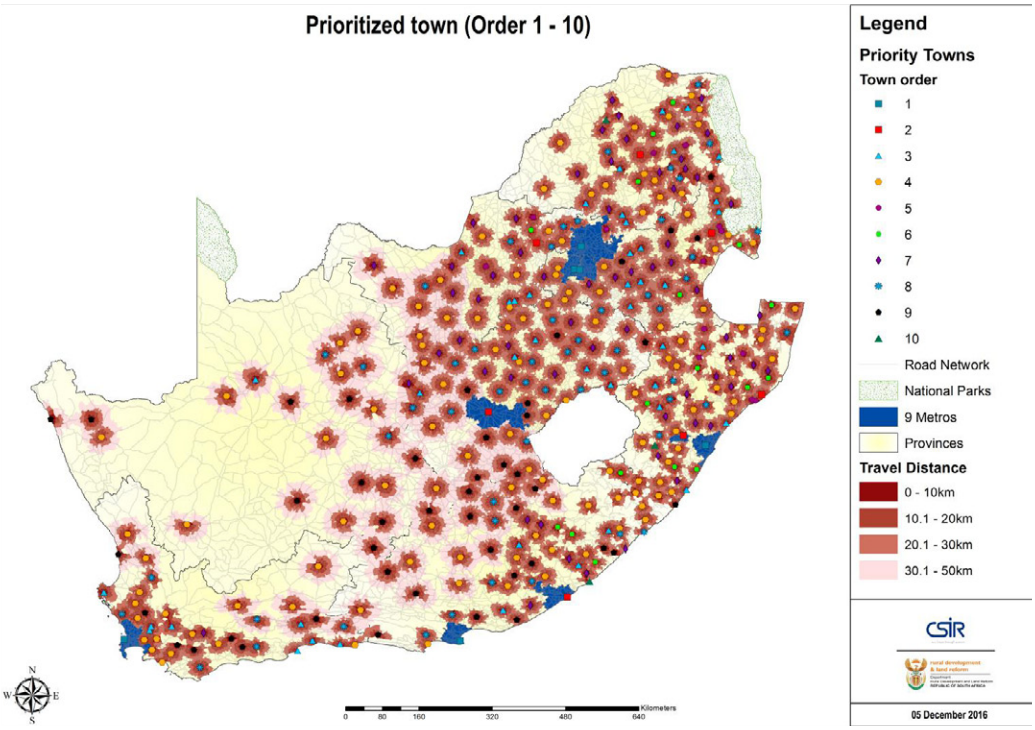

Figure 1: Prioritised towns and orders and surrounding travel distance bands (Source: Authors, 2016)

The catchment and travel distance analysis results revealed that, if the catchment level is the only criteria considered in the allocation of middle order services, there is a problem of potential service redundancy due to the overlapping and competing nature of catchments. This could result in low population thresholds at some places, thus potentially limiting the positive agglomeration effects through too much competition within the travel range.

This led to the approach of testing spatial optimisation analysis techniques to select catchment node points with non-overlapping service areas within a specific distance range and with minimum threshold levels. Thus, the most central places from each of the catchment levels were selected. The purpose was to achieve more cost-efficiency in service distribution but to still maintain equity in the location of typical middle-order services. Using the goal of service efficiency in conjunction with accessibility as the departure point, an optimisation analysis of all 1 328 node centroids in South Africa was done to identify optimum locations for social facility 'service malls' from the existing catchment centroid points (towns). The goal was to select the least number of service points from which to service the maximum number of citizens.

Since, the access range of this group of social services is generally between 20km and 30km for most areas, with a 50km range being acceptable in the very sparse western parts, these parameters were used as input distances for the optimisation analysis. (The distance is based on the road network rather than simply on a straight line distance). The use of GIS and the concept of a maximum travel distance addresses the issue of spatial quantification and fairness and enables analysis across space such that it is not limited by service ratios within administrative or other spatial units. This approach allows for measurement across boundaries, more closely reflecting the travel choices of citizens who are generally not aware of the demarcation lines between areas such as those for education or health districts.

The optimisation was applied to all areas of South Africa outside the boundaries of the metropolitan areas. A key assumption was that based on the regional importance or size of the Level 1 to 4's, analysis should by default include all these nodes and then select the most spatially optimally located towns from the remainder, irrespective of the catchment level in which the town is located. The starting point of the analysis was thus to demarcate a 30km/50km catchment around each of these nodal towns based on the network distance. Following this, an optimisation analysis algorithm was applied to all areas more than 30km/50km from a Level 1 to 4's to identify the remaining most optimal locations in the Level 5 to 10 catchment nodes to act as middle-order service provision centres. Owing to computational limitations, the analysis was done using a 50km2 spatial unit (cells).

The catchment optimisation model sequentially and iteratively identified the cells which were the most

optimal and densely populated within the distance parameter. Once all suitable cells were identified, they were assigned to the nearest towns serving as catchment centroids. This process was completed though a manual check and a catchment analysis in competition with all other towns was used to generate the final service statistics. The minimum population required was at least 5 000 people living within 30km/50km from such a centroid for it be included as a so-called priority node.

5.2 Findings

The outcome of the final catchment analysis, which took into consideration competition between catchments, was impressive. Service coverage of 91.8% of the total population within the 30km/50km range was possible from 378 central points. When only considering the non-metro population, 86.3% of people can be served from 369 points. This is a major reduction from the 805 places required to reach 96% of the population if using the catchment level approach (the first approach)) as opposed to applying a spatially targeted approach. The prioritised town locations and the respective travel distances covered around the priority towns are shown in Figure 1.

Figure 2 below shows the number of identified prioritised towns in relation to the total number of catchment centroids/ town points.

The implication of this is highlighted in Figure 3, which shows that by spatially targeting prioritised towns that optimally reach areas of 30km (50km in sparse areas) or less with no overlap, it is possible to achieve high service coverage whilst minimising the number of service points.

6. RESEARCH CONTRIBUTION

The analysis has implications for service provision throughout the country. The prioritized locations specifically identified for middle-order service location means that service providers can achieve high service reach levels using fewer locations rather than trying to roll out services to every corner of the country. These prioritized towns can potentially provide middle-order services to 92% of the country's population within 30/50km of 378 selected towns. If this spatially targeted investment strategy is used to locate middle-order services as described above, it reduces the number of potential points to be serviced by over 50% while still being within an acceptable travel distance of over 90% of citizens, including those in rural areas.

With this information, service providers have a clear understanding of which locations can yield the optimal service reach levels in the most efficient manner. This information can also be used to support a range of other investment decisions, both public and private, in a more cohesive manner.

This could have a major impact on the rationalisation of services and more efficient allocation of resources to areas of greatest impact, potentially allowing for a greater emphasis on quality and operational efficiency. This is especially relevant given the expected increased demand on the South African fiscus within the medium term.

7. RESEARCH LIMITATIONS

The successful implementation of the research outputs will depend largely on government's investment policies and the availability of resources.

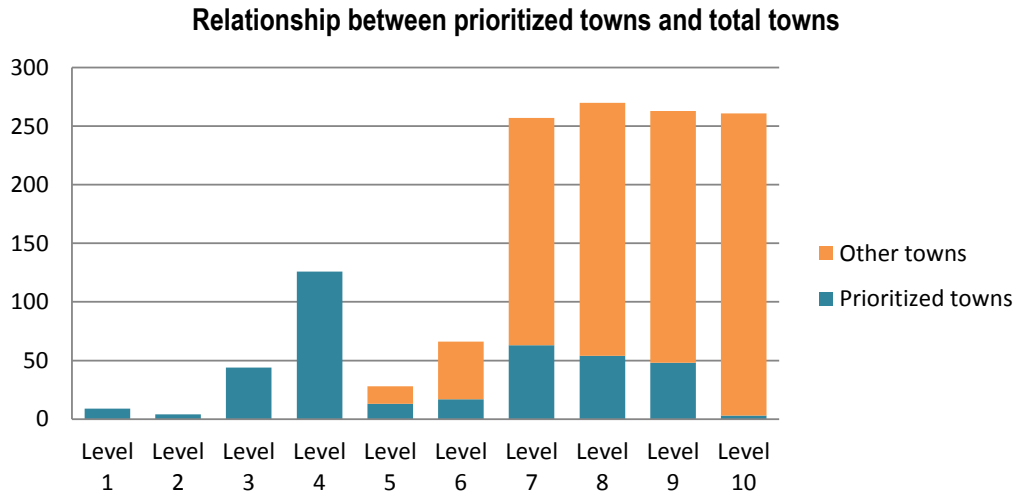

Figure 2: Relationship between prioritised towns and total towns (Source: Authors, 2016)

Town Category	Towns by Orders (Cumulative Values)										
	Order 1 (9 cities)	Order 2	Order 3	Order 4	Order 5	Order 6	Order 7	Order 8	Order 9	Order 10	*Total*
All towns (No prioritisation)											
Number of towns	9	13	57	184	212	278	535	805	1 067	1 328	***1 328***
% population reached in 30/50km	40.5%	42.3%	55.7%	74.4%	80.6%	83.6%	91.3%	95.9%	98.3%	99.2%	99.2%
Prioritized towns – including the 9 cities											
Number of towns	9	13	57	184	197	214	276	330	375	378	***378***
% population reached in 30/50km	40.4%	42.3%	55.7%	74.5%	77.8%	80.6%	87.0%	90.3%	91.7%	91.8%	91.8%
Prioritized towns – excluding the 9 cities											
Number of towns	-	4	48	175	188	205	267	321	366	369	***369***
% population reached in 30/50km	0%	3.0%	25.6%	57.1%	62.7%	67.5%	78.2%	83.6%	86.0%	86.3%	86.3%

Figure 3. Number of towns and population per order

For instance, it is stressed that as far as possible facilities should be clustered and that the selection of nodes where there is already existing development or infrastructure should be a key consideration in locating facilities. Resource constraints, particularly around budgets and staffing, mean that a roll-out of service provision (especially in the case of the more specialised and larger facilities) may be required such that the most needy and largest populations are served first and choices may have to be made between two similar locations. In this regard, the use of the prioritised town hierarchy which has been developed will be critical.

The lack of well-maintained datasets on current facilities means that additional local planning is required to avoid the duplication of services. The analysis was not able to consider the availability of public transport and route networks as this information is not readily available in a usable format.

8. DISCUSSION & CONCLUDING REMARKS

A multi-pronged approach has been taken. Firstly, to demarcate the country into service catchment regions and to profile these with parameters relevant to social service delivery and defined social facility service packages for each catchment. (Please see www.socialfacilityprovisiontoolkit.co.za.) This data can also be supportive of a range of other planning activities. Secondly, a non-overlapping hierarchy of central places/nodes where middle to higher order services can be sustainably provided at central and accessible places was developed. This structure can provide a basis for incrementally extending services to as many people as possible over the longer term.

Middle-order services that are essential for citizens to transact fully in society should firstly be directed to the prioritised nodes before they are provided to any other places with sufficient demand for such services. (Provision of low-order services provided by local facilities such as schools, social grant pay points and small health facilities would be required by all nodes.)

It is in the provision of clustered middle-order services that the opportunity exists to direct investment optimally outside the metros. This targeted approach can best serve non-metro citizens by using the prioritised town points in order to serve the maximum number of citizens in the surrounding communities from the least number of points.

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Regional planning in South Africa: an unfulfilled mandate from 1994?

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Exploring the relational complexity between regional planning and public policy deployment in the case of South Africa, using the case of iLembe district municipality, the paper traces regional planning post democracy and argues that the role of regional planning is largely unfulfilled in the current suite of planning instruments.

INTRODUCTION

Globally, regional planning is widely used in different scales of national, regional, metropolitan and economic spatial planning, and is seen as essential for supporting the economic development and competitiveness of nations in the epoch of globalization (Amin, 1999, Storper, 1997, Castells, 2014, Brenner and Wachsmuth, 2012, Porter, 1998, Dawkins, 2003). This paper will focus on regional planning from the formation of the democratic republic in South Africa to the present, and considers what kind of local and regional planning has emerged in dealing with the challenges of economic growth and sustainable development. Whilst the South African space economy is considered to be relatively diverse, long term structural weaknesses persist (Padayachee, 2006, Marais, 2011). Poverty, inequality and unemployment continue to be serious challenges, despite major expenditure on socio economic infrastructure by the state since 1994 to close the gap between the apartheid and post-apartheid period (Marais, 2011, Plaatjies et al., 2016). The analysis that follows outlines regional planning as mandated by the Constitution of the Republic of South Africa and the role of the local state in planning to meet these challenges. The analysis is drawn from insights using a range of existing secondary literature in which regional planning and public policies relating to competitive regions are mentioned. Included are official state documents. Interviews with practicing planners from the iLembe District municipality and associated entities have helped enrich the study. The study is a work in progress on regional planning in South Africa.

The paper is structured in the following way: Section 2 reviews the literature and international influences on regional planning theory. Section 3 locates regional and spatial planning policy in South Africa since 1994, the global economic context, and recent national economic policies, inter alia, the Industrial Policy Action Plan (2008), New Growth Plan (2009), Rural Development Strategy (2010), National Development Plan (2011) and Strategic Infrastructure Programme (2012) provide the framework. Section 4 explores regional planning through the case of the iLembe District Municipality in the Province of KwaZulu-Natal. The paper concludes that the role of regional planning is largely absent in the current suite of planning instruments, that a number of sectoral policies that have spatial consequences are lacking coherence and synchronization, and that the intergovernmental system for co-ordination is complex and burdensome for the size and shape of the South African system.

ANALYTICAL FRAMEWORK AND INTERNATIONAL INFLUENCES

The analytic approach is informed by a review of the international literature on regional planning to support analysis of the complex and multi scaler relationships that exist between policy deployment, institutional and integrated development, and capital formation in the political economy in South Africa. The origins of regional planning are found in wide ranging disciplines, including spatial and economic geography, sociology, spatial planning, economics, politics, social science and public management (Campbell and Fainstein, 2003, Pike, 2007) and can be considered, not surprisingly, as contentious. Definitions of regional planning depend on context, including institutional and legal, particular planning cultures and traditions, and identities (Friedmann, 1963, Friedmann, 2001, Healey and Upton, 2010, Paasi, 2012, Scott and Storper, 2007, Hillier and Healey, 2008). Hall (1992) states it "refers specifically to economic planning with a view to the development of regions which, for one reason or another, are suffering serious economic

problems, as demonstrated by indices such as high unemployment or low incomes in relation to the rest of the nation," and referred to in the literature as 'problem regions', 'lagging regions', 'less favored regions' and 'underperforming regions' (Pike et al., 2007).

Other definitions include "the methods used to influence the future distribution of activities in space" (CEC 1997b cited in Glasson and Marshall, 2007). Whilst others suggest that co-ordination of spatial impacts of other sectoral policies, interventions associated with distribution of economic development between regions as a result of market failures, and land use regulations (CEC, ibid). Regions take on various forms, such as administrative, cultural, economic, functional, governmental, and historical, in which the conditions for capital formation and accumulation in a regional configuration significantly lead to the organization of economic and social life for its citizens in which optimum arrangements are realized. It includes the use of land and other resources to meet social, economic and environmental needs for current and future generations, and to ensure resilience to external and internal disruptions. Analysis of the complex flows of capital, labour, resources and raw materials, sector markets, competitive and comparative advantage of local economies, value chains across contiguous spaces and regions, land markets and infrastructure, institutional context (conventions, practices and policies), and the role of social partners, are necessary to inform regional planning interventions.

Regional planning approaches are considered heterogeneous, with common elements relating to: territory that is regionally defined, that form part of sub-national administrative units, and that require spatial planning. At least seven elements are identified in the literature relating to what national framework should guide and enable the development of regional planning. They include competitive and comparative advantage (McGuirk, 2005, Harrison, 2010, Storper and Scott, 1995), cluster theory (Porter, 1998), flexible specialisation and agglomeration, networking and co-operative competition (Markusen, 2003, Wood and Valler, 2004); territorial (Brenner, 1998), co-operative governance and institutions as complex - including government agencies, trade unions, civil society and multi-lateral agencies (Jessop, 2004, Amin and Thrift, 2000, Amin, 1999, Andrew and Feiock, 2010), strategic spatial planning (Hillier and Healey, 2008), regional identity (Paasi, 2012), and redistributive concerns (Peck et al., 2010). More recently, the importance of local context and particular growth experience, or place-based concerns have been highlighted by Barca et al (Barca et al., 2012) and Markey et al (Markey et al., 2008) as the core of economic development and success in which spatial inequalities invoking redistributive concerns are expressed.

Related concepts include "New Regionalism" (Keating, 1998) in a post-Fordism and subsequent globalization context in which new regional spaces and descriptors such as city regions, cross border regions, and metropolitan regions have emerged. Key shifts are a result of major changes in the "production of space" (Lefebvre, 1991), the global context of economic reconfiguration, and resultant influences of digital processes on production and consumption under contemporary capitalism. These include the push to innovation and learning nations, the transforming role of the modern state and greater decentralization to the local state (Keating and Loughlin, 2013, Keating, 1998, Jessop, 2002). In addition there is public policy focus on revitalizing local economies through the generation of new technologies and commercialization and production thereof, an expanded definition inclusive of relational effectiveness of supply chains, public and private sectors, civil society, building social capital and collaborative efforts, and co-operative competition (Nalebuff and Brandenburger, 1997). Pike et al, (2007) argue that "no singularly agreed homogeneous understanding of development of or for localities and regions exist", reinforcing heterogeneity associated with defining regions. Regions thus can be defined as the functional spaces of economic planning and governance in which capital formation in relation to land, labor, capital and the regulatory environment intersect, and in which conditions to support markets and social concerns are deliberated.

A key objectives for planning in an increasing complex world, is the need to support economic competitiveness, territorial cohesion, equity, and sustainability. Exemplars of new regionalism mainly located in developed nations, are Silicon Valley, Baden-Württemberg and Emilia Romagna (Hospers and Beugelsdijk, 2002). Whilst advanced economies emphasize these elements, a major gap in the regional planning literature relates to developing countries, peripheral, and poorer locations, who do not share these experiences. Regional planning is largely absent and situations prevail in which inter alia, complexity, heterogeneity, informality, alternative land arrangements exist side by side with private land ownership, and where coherent formal

markets are largely absent, and yet where complex inter and intra government administrative systems co-exist with Traditional systems (Pike, 2014, Scott and Storper, 2007, Rogerson, 2010, Turok, 2010, Harrison and Todes, 2001, Todes, 2004, Todes, 2011). Even though some indicators of regional planning discussed earlier are valid for advanced capitalist economies and may not be wholly applicable to the context of developing countries, they are useful for a country like South Africa attempting to modernize its own economy, where elements of contemporary industrial capitalism exist alongside deprivation and poverty.

For the purposes of this research, the term regional planning is defined as it refers to space, territory and place, its relationship to the political economy with particular interest in the location of economic and industrial activity and the related competitive drivers of economic performance. Successful regions display markets that are organized and networked in which co-opetition[1] and the use of the digital economy as integrator find expression in the more efficient utilization of the space economy. This includes being locations of knowledge and learning that support innovation and creativity, an attractive investment environment, well developed human capital, infrastructure and connectivity, economic diversity and specialization, and governance arrangements (Clarke and Eyal, 2013). In summary, the concept of capital formation in the production of space, using land, labor, capital and the regulatory environment, inclusive of competitive and comparative advantage scrutiny, is key.

SOUTH AFRICAN CONTEXT: REGIONAL, ECONOMIC AND SPATIAL PLANNING

Regional planning in South Africa under Apartheid (1949-1994) has been a relatively effective planning instrument in establishing the political economy of separate development and spatial fabric, albeit with its skewed and morally reprehensible objectives. This is well documented in the establishment of the Homelands system, de-concentration growth points and low wage industrial areas, often in rural and peri-urban areas in pursuit of racial capitalism (Dewar et al., 1986, Wellings and Black, 1986, Rogerson, 1998, Rogerson and Rogerson, 2010, Wittenberg, 2003). Furthermore, the planning system under apartheid reinforced racial capitalism through linkages to an industrial strategy that supported the traditional mineral energy complex (Fine and Rustomjee, 1996). The social, economic and spatial expression of the apartheid system was one of inequality at every level of society and set the context for transformation of post- apartheid South Africa.

However, two decades into democracy and economic development in South Africa (1994 to the present), the spatial divide in relation to socio-economic development persists, the spatial expression of the political economy has in the main remained intact leading to the exacerbation of the triple crises of structural unemployment, poverty and inequality as identified in the National Development Plan (National Planning Commission, 2011). The public expression of poor service delivery inter alia, is articulated in the voices of the urban and rural marginalized through growing protest action. Growth centers are in the core, such as Gauteng, Durban and Cape Town, whilst the periphery and outer periphery continue to decline. The salient feature of structural unemployment is an expression of both "market" and "government" failure within the current political economy, despite twenty years of democratic informed policy-making. The economy is increasingly divided between a formal economy that is not job producing, and a growing informal sector that contributes approximately R160 billion into the economy, and an estimated 28% to GDP (SALGA, 2016). The intended transformation of spatial planning has been slow to respond to these challenges and in the main been a policy 'taker' rather than a proactive policy maker. One of the key contributors to the current scenario is the perceived disarticulation of the policy frameworks driving economic development and growth (Kaplan, 2013, Malikane, 2016)

Spatial Planning

Since 1994, regional planning has largely fallen away as an instrument for growth and development, and been replaced with newly demarcated political and administrative boundaries defined by the Local Government Municipal Government Demarcation Act of 1998, the Municipal Structures Act of 1998 and the Local Government Municipal Systems Act of 2000, and others, with defined responsibilities (Berrisford, 2011). The key purpose of spatial planning as defined in the Constitution (Republic of South Africa, 1996), is to provide ethical, fair, just and sustainable solutions to the built environment and mandates local government to provide equitable and efficient services, build local democracy, promote social and economic development, collect revenues, ensure safe and healthy environments and create sustainable local government systems. However many local government structures have been insufficiently resourced by way of skills and organizational systems to function as entities, and thereby able to fully engage within their mandate. In addition, the main impetus driving the demarcation appears to be political rather than criteria based on

the economic potential, socio-economic, revenue and other considerations.

With the introduction of the above local government legislation, the planning system has been overhauled to establish "wall to wall" local government systems. The current spatial planning framework in South Africa is derived from the Constitution (Republic of South Africa, 1996) listed in Schedule 4 Part A, provincial planning listed in Part A of Schedule 5 and "municipal planning" listed in Part B of Schedule 4. It is recognized that there are overlapping functions between the different spheres of government. Regional/provincial planning and development is perhaps the least developed of all the planning instruments, and are allocated to provinces in terms of Schedule 5.

Similarly, governments redistributive approach to meet the basic needs of the poor have placed greater burden on local municipalities to deliver. The government system is complex, with a total of 45 ministries at national government level, 9 provinces, 8 metropolitan municipalities, 44 district municipalities and 226 local municipalities (http://www.gov.za/), to service a population of 54,9 million (Statistics South Africa, 2015). Figure 1 below outlines the complex planning architecture and intersecting policy, legislation and intergovernmental linkages. Moreover, an intergovernmental system to achieve maximum impact on government investment in a given locale was introduced through the Municipal Finance Management Act 2003 and the Intergovernmental Relations Framework Act of 2005 (IGR). The Medium Term Strategic Framework is governments 5 year electoral plan, that provides a mandate to provinces, districts and local municipalities.

Intergovernmental system and sectoral planning

Funding of decentralized local government has also undergone complex transition and is carried out through the National Treasury as mandated by the Constitution and Intergovernmental Fiscal Relations Act of 1997. Provinces and municipalities are funded through a system of grants, a provincial unconditional equitable share grant based on population distribution in which basic services to poor households, institutional administrative support and community services are considered, and other conditional grants as determined by the Fiscal and Finance Commission (Treasury, 2014, Pearson et al., 2016, Wittenberg, 2003). This was considered necessary due to insufficiently developed administrative structures and tax base from which to operate as municipal entities. The equitable share formulae has recently been reviewed as it was considered to be lacking in coordination and cohesion in effectiveness of impact in planning and management of infrastructure (Finance and Fiscal Commission, 2012, Treasury, 2014, van Donk et al., 2008). Moreover, the National Treasury has increasingly played a coordinating role within the State, across government departments and entities, through an intergovernmental system and framework of "co-operative governance" across national , provincial and local government spheres (Pearson et al., 2016). In particular, this has been done through budget and financial management reform measures devolved to local government, whilst maintaining a degree of centralized control. This is realized through the instruments of the Medium Term Expenditure Framework (MTEF) and Public Finance Management Act (PFMA)[3].

Figure 1 illustrates the relationship between government spheres, legislation, and supporting institutions for coherent policy deployment. The IGR system, made up of crosscutting ministries, clusters, and technical committees, is complex and burdensome for the size and shape of the public administration system, population characteristics and market needs.

To illustrate the point, at national level the IGR vertical and horizontal alignment structures support twenty-one committees, at provincial level using KwaZulu-Natal as an example, there are eleven and using the example of iLembe at a district level, there are ten – indicating forty-two IGR structures across spheres of government. Moreover, whilst there are spatial planning instruments at provincial, district and local municipal spheres, at national level these are lacking. Likewise, 129 state owned enterprisers (SOE's) mainly responsible for supply side infrastructure push, such as transport, energy and financing, represents state monopoly over key areas, with little incentive for competitiveness resulting in inefficiencies and high costs of doing business, especially for local municipalities dependent on bulk supply of services in a local context.

State led policies and spatial initiatives 1994-2016

From 1994 a number of national economic plans with spatial implications, have been undertaken to address apartheid legacy deficits, spatially rooted poverty and associated spatial inequalities, whilst at the same time enabling investment and economic growth requirements. This has also been in a context of reductions in tariff protection

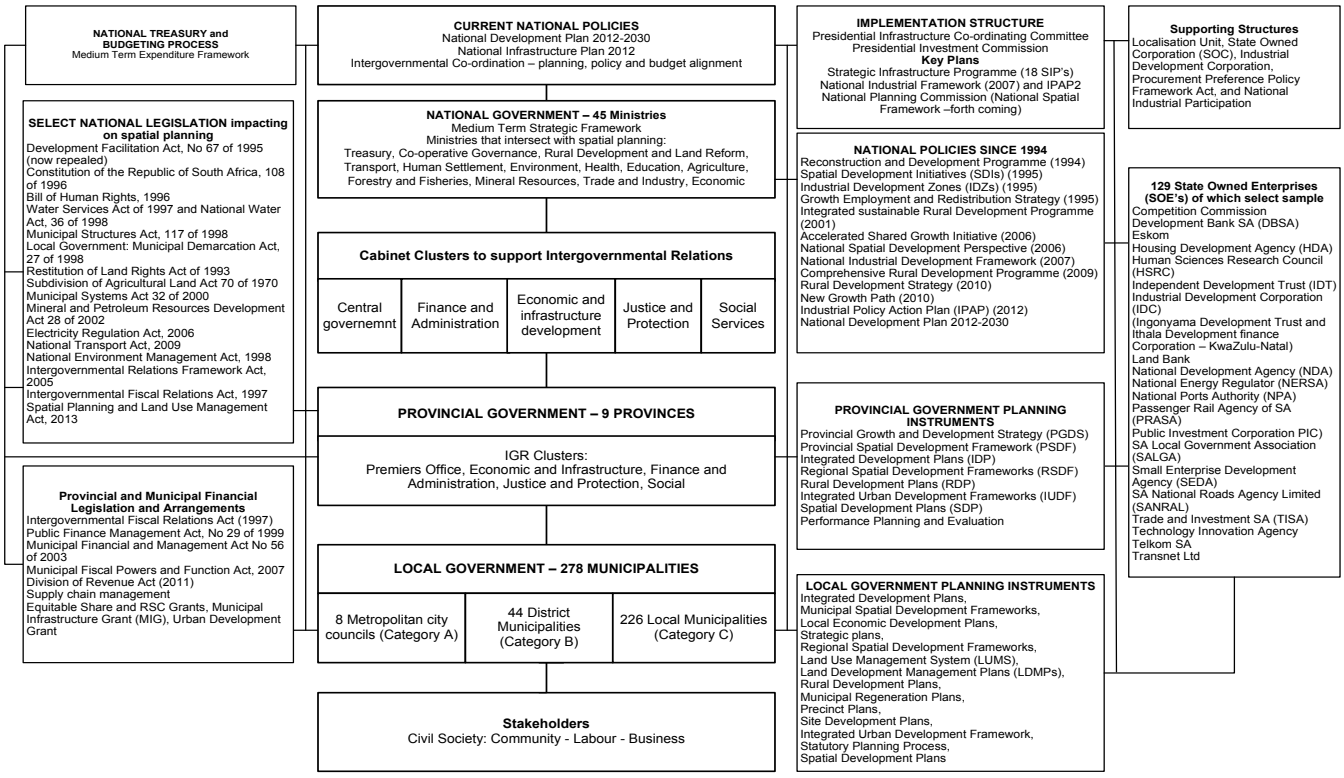

Figure 1. Post 1994 national, provincial and local planning system and key national economic policies (with spatial dimensions). Source: author´s compilation using various government documents.

post 1994 that has negatively exposed South Africa to global forces. Rogerson (2010) suggests there has been somewhat confusing and uncoordinated application of regional planning at government level. Recent national policies include the New Growth Path (2010), supported by the Industrial Policy Action Plan-(IPAP), which argues for the re-industrialization of the South African economy and a focus on the green economy. However, the 2007 National Industrial Development Framework (NIDF) is administered by the National Department of Trade and Industry (DTI) to facilitate inter alia, economic diversification, labor absorbing industrialization and developing a knowledge based economy; but yet again, governments R1Trillion infrastructure spend through the Presidential Infrastructure Coordinating Commission (PICC) focusing mainly on energy and transport infrastructure; and in addition, the National Development Plan Vison for 2030, argues for a developmental state and a more inclusive and dynamic competitive economy in which the benefits are shared more equally, including an ambitious 5% growth rate target. Figure 2 outlines these plans and intended outcomes.

The NSDP (2006) was the first real attempt at national spatial policy, but beset by rural/urban divide perceptions and emerging neo-liberal critiques, insufficient implementation ensured (Oranje and Merrifield, 2010). From 2009, spatial targeting supporting sectoral interests and agencies within government, and largely driven by SOE's, have in the main been supply driven in response to declining employment in labor intensive manufacturing and mining, overall contraction of the market, particularly in the post 2008 global financial crisis, and continuing recessionary environment. Hence high levels of state expenditure in social welfare grants to mitigate poverty, large-scale infrastructure projects – road, rail, ports, water, sanitation, and state aided industrialization aimed at attracting firms through various policies alluded to in Figure 2. Furthermore, a reluctance to invest by business in an uncertain economic climate mitigates against the states attempts at reindustrializing the economy through beneficiation and the IPAP programme of the Department of Trade and Industry.

The spatial effect has been a concentration of investment to urban areas of GVA and employment opportunities, slow growth in secondary cities and smaller towns, and increasing urban poverty (South Africn Cities Network, 2016). Former homelands continue to be areas of social reproduction and concentrated areas of poverty, with high levels of unemployment and other social shortfalls. Dependency on remittances, social grants and other social welfare payments continue and are unlikely to decline in the near future. In summary, the last two decades has seen the sectoral contraction of the spatial distribution of the economy.

1995 National Development Spatial Framework	Attempt to map government investment and co-ordinate public spending and infrastructure through the office of the RDP
1997-1999 Spatial Development Initiatives (SDI)	11 SDI's – Using investment corridors as a means to link economic nodes with spread effects
2003/2006 National Spatial Development Plan (NSDP) **2006** Draft Regional Industrial Development Strategy (RIDS)	Spatial analysis and mapping of South Africa's economic, social and spatial trends to guide future discussions on infrastructure and government productive expenditure. Key interventions: spend in areas of highest economic potential and target social development spending in high poverty areas. Key spatial concept: growth nodes and corridors Industrial Development Zones (IDZs) introduced
2009 New Growth Path (NGP)	State led drive for job growth, revitalize rural development (especially former homelands), 5 key drivers - boost public investment in **infrastructure** and energy; support main **economic sectors** (agriculture and agro-processing, mining, manufacturing; support **new economies** (green and knowledge economy); **social capital** and public sector; **spatial development** opportunities in rural areas and broader region
2010 Rural Development Strategy	Key concerns are: agrarian transformation - system and patterns of ownership and control of land, livestock, cropping and community, an integrated programme of rural development, land reform and agrarian change (mobilizing productive agriculture, rural tourism potential, reviving secondary towns, exploiting opportunities in mining and manufacturing)
2011 National Development Plan (NDP)	Multiple development objectives with a 20 year time frame and 5% growth target
2012 National Infrastructure Plan	Supports the NGP and NDP - job creation, service delivery, tackling poverty and inequality (18 Strategic Infrastructure Projects)
2014 Industrial Policy Action Plan (IPAP)	Special Economic Zones (EPZ) legislated – geographically designed areas for targeted economic activities (Manufacturing activities qualify for financial and other incentives and reduced corporate tax)
2016 National Transport Plan	First comprehensively planned multi-modal, integrated and sustainable framework for providing transport, infrastructure and services

Figure 2. South African State led Policy and spatial initiatives 1994-2012. Reference: (Oranje and Merrifield, 2010) and authors compilation using various government documents.

Government defines itself as a 'developmental state' in which state-led intervention has been a key driver in economic development initiatives as identified in the above policies, but all the above-mentioned policy complexity and low outputs raise questions. These relate to scaler spatial planning and realization of policies in the absence of national, regional, sub regional and local planning with supporting delivery instruments. Turok (2010) suggests that "the contribution of regional and local authorities to the developmental state have been somewhat neglected" and the National Development Plan acknowledges the weakness of spatial planning and the lack of a national spatial framework (National Planning Commission, 2011). The NDP proposes a hierarchical schema of competitive corridors, nodes, restructuring zones, to environmental concerns expressed as green economy zones. Furthermore, three proposed interventions include the formulation of a National Spatial Framework (NSF), the establishment of a national observatory for spatial data, and dedicated funding (consolidating existing funding streams in the built environment), but to date there has been little tangible progress with implementation. Hence the impact on an evolving planning architecture renders spatial planning playing "catch up" in the built environment rather than as a proactive instrument determining economic development and infrastructure requirements.

In the absence of coherent national planning, uncoordinated responses to critical development issues ensue at various spheres of government. For example, choices relating to the energy supply mix such as proposed fracking, nuclear power and renewable energy appear to be unplanned responses to urgent energy needs required for a 5% growth trajectory as set in the NDP. At provincial level, the Provincial Growth and Development Strategies identify competitiveness in areas such as education, innovation, human resources and industrial growth. Likewise, in the absence of an agreed urbanization policy framework since 1994, and introduced only in 2016, recent efforts at introducing new regionalism at city scale include the Gauteng City Region initiative, and increasingly the discourses of metropolitan councils include branding concepts such as "gateways", "learning cities", "smart cities" with each city, in the pursuit of its own investment. Development Agencies such as the Johannesburg Development Agency, Enterprise iLembe[4] and

the Department of Co-operative Government and Traditional Affairs (COGTA) Economic Development Agencies (EDAs), largely based on EU examples, to drive economic development have been established. Similarly, the SOE's that are meant to facilitate and cross-subsidize capital formation at local level tend to represent vested interest, operate in siloes and are weakly linked to municipalities and their planning systems. Moreover, there are decisions at a national level that have negative local impact, such as South African National Roads Agency Limited's (SANRAL) tolling of roads that cut across local municipalities.

Almost all the policies in Figure 2 refer to spatial planning, and occasionally to regional planning, all speak to the need to be competitive, but its meaning is seldom articulated, and almost never in spatial terms. More recently, the urgency of considering regions in spatial development planning to support the NDP has been expressed in various government forums (Department of Trade and Industry, 2007, Department of Economic Development, 2013) but to date there has been little tangible progress. The intersecting and sometimes competing legislation, jurisdictional concerns, government structures, supporting institutions, SOE's and plethora of cross cutting policies across spheres of government, demonstrate a complex government system. At a municipal level, this is complicated further by the inclusion of Traditional Authorities alongside democratic municipal institutions, as will be highlighted in the case study. A persistent weakness remains poor linkages between market requirements and supportive planning tools.

CASE STUDY OF THE ILEMBE DISTRICT MUNICIPALITY

The case study uses the analytical lens of the production of space through capital formation in the context of formal and informal markets, and the regulatory and spatial planning environment to support economic growth and development. The iLembe District Municipality (DC 29) (hereafter referred to as the District) is located on the east coast of KwaZulu-Natal, to the north of the eThekwini Metro, and south of the uThungulu District and is made up of four local municipalities, Mandeni, KwaDukuza, Ndwedwe and Maphumulo. The District is a relatively fast growing region, yet facing serious economic, infrastructure delivery, and social challenges, including poverty and inequality mostly experienced in small towns associated with commercial agriculture, and former apartheid homeland areas (current Ingonyama Trust area). iLembe has a population of approximately 606,809 and is growing at a rate of 0, 8%, with an age profile of 34% under the age of 15, 61% (between the age of 16-65) is made up of the working age population, and 5% are 65 and over. The gender breakdown is 52% female and 48% male. The unemployment rate is 31%, and among the youth (aged 15-35) is 37%. Almost 40% of households earn no income, the majority of the population live on less that R500 per month and are grant dependent. The size of the informal sector is estimated at 23% against the national average of 30% (iLembe District Municipality, 2014, Statistics South Africa, 2011). The population analysis closely mirrors the national picture where the size and shape of the double youth bulge will not necessarily yield the youth dividend – where 34% are under the age of 15, and the highest unemployment figure of 31% is felt by the youth between 15-35, resulting in rising poverty, informality, high dependency ratios and increasing grant dependency.

The iLembe Integrated Development Plan (iLembe District Municipality, 2014), describes the District as well located between two of Africa's busiest ports, Durban and Richards Bay, and closely located to the King Shaka International Airport and Dube Trade Port, and on the primary KwaZulu-Natal Provincial economic development corridor (N2). As such, is well positioned in terms of local and international markets. The main economic activities are commercial farming (mainly sugar, some forestry and emerging mixed farming), and associated milling industry (Gledhow and Darnell mills), Sappi Paper mill at Mandeni, and tourism. Land holdings in the District present an interesting

Figure 3. Locality map - iLembe District Municipality (DC29) KwaZulu-Natal, South Africa. Maps by J. Kitching 2016

case. According to the IDP, the majority of land (63%) is controlled by Traditional Authorities and is jointly managed by the State and Ingonyama Trust. A further 31% contributes to commercial farming, and cultivation is mainly privately owned sugar cane. It is worth noting that Tongaat-Hulett (TH) is a major private landowner in iLembe, primarily engaged in agricultural activity and release of land for high-end residential development, resulting in monopolistic control of land release and land prices. This begs the question of its role as pro-active development player or a patient land seller that has potential to constrain the local municipality who may have different development objectives.

The case study poses interesting problems in relation to regional planning. Whilst the District is strategically located, it represents contrasting economic and social development challenges. There are high levels of inequality in settlement patterns with a major concentration of wealth in the western coastal corridor and high levels of poverty in the rural inland areas. There is uneven development, represented by Ballito with a high degree of services yet still fragile for an emerging large town, and the rest with poor quality of services, the commercial farming sector being well serviced, whilst trust land areas still have very poor access to services. Furthermore, whilst there has been some land reform and redistribution outcomes, there has been insufficient progress in scale, and there are outstanding claims that have not been settled. In effect, this represents the spatial construct of apartheid that has not been broken 20 years into democratic local government in South Africa. The sugar industry is under threat from global competition and its future is uncertain. The tourism industry also faces competition from other regions in South Africa.

Intergovernmental system

The District is linked to the national IGR through the provincial system and the KZN Provincial Growth and Development Plan, organized by clusters, technical committees and stakeholder processes that mirror the national and provincial IGR system and constrained by national treasury requirements. Additionally, a District IGR structure co-ordinates 10 fora at district level. The system is clearly cumbersome, in which diary synchronization and regular attendance of key decision makers has been identified as a challenge. Whilst alignment to national policy is evident in the statements of the IDP, there is little corresponding evidence on the ground. Achieving co-ordination, integration and alignment between departments presents a challenge. For example, the key built environment functions of housing, transport, land management, energy, environmental planning, economic planning and development, land reform, amongst others, cut horizontally and vertically across the different spheres of government.

Spatial Planning Instruments

The Municipal Systems Act as indicate in Figure 1 governs municipal planning and related spatial planning. Briefly, the alignment of national policies to municipal planning are through the Provincial Growth and Development Strategy (PGDS), the Municipal Integrated Development Plan (IDP), and supporting hierarchy of spatial plans, inter alia iLembe District Spatial Economic Development Strategy, Spatial Development Framework, Regional Spatial Development Plan and underpinned by an Environmental Development Management Framework. In all the planning instruments, there is little evidence of a coherent regional plan, and in the main, regional planning is mentioned as a component of strategic mapping with little underpinning strategy, in either the IDP or the local economic development strategy for the District. The key mandate for District municipalities and local authorities is efficient service delivery to people and business. Responsibility for economic planning is shared and contested between province, the District and local municipalities (PGDS, provincial Economic Development Department, and LED units located in the District and four local municipalities) in which strategies are weakly developed, that tend to be government driven and funded, and do not account for market demand.

A cursory review of iLembe's planning documents reveals a mainly descriptive account of current context, weak analysis of the challenges to the local economy. It largely ignores issues relating to a local industrial strategy, weak identification of the competitive and comparative advantage of the District economy, and no clear strategies for developing long term manufacturing capabilities, labor absorbing employment, and innovative capabilities associated with new sectors of the economy. For example, LED projects identified include six live projects and ten pending funding, largely dependent on provincial government funding cycles, SOE's or external funding, and mainly engaged in low order activities such as block making and mini mobile bakeries. Enterprise iLembe membership comprises mainly service sector companies supporting agriculture, franchises, retail, tourism, and professional services. The IDP is largely silent on informality, albeit a major influence in the District, and there is

little evidence of partnership coalitions to mobilize support in this sector. This may represent local development policies that are either not working, or having the desired impact.

There is little mention of the constitutional mandate relating to regional planning, or relationships with adjacent municipalities, and strategic partnerships, alliances and cooperation amongst stakeholders are absent, representing weak social capital development. Interviews conducted with spatial planners from the municipalities confirm few of the NDP, DTI, or economic development mechanisms are incorporated, or inform spatial planning. Instruments for capital formation are weak and primarily linked to traditional economic sectors like tourism and service industries all of which are insufficiently labor absorbing. In brief, the study reveals disparity at local district level; economic activity is concentrated in KwaDukuza (Ballito) and Mandeni (Isithebe); that the environment for capital formation is weak; there are high levels of informality, and governance systems are lacking inclusive coalitions.

From the above analysis, the current spatial planning instruments do not sufficiently consider the economy, trade and production systems, commodity and value supply chains across sectors, competitive considerations, and most importantly the mobilization of economic stakeholders. The result is a local planning system that conforms to compliance practices and insufficiently engages with local developmental needs of people or developing competitive business clusters. To illustrate the point, the following examples indicate the potential for developing a regional planning framework to allow planning to become more effective.

As one of the key economic activities in iLembe, the sugar industry is under threat across the Province, inter alia declining global prices, lack of government policy direction and support, a fractured industry facing internal transformation challenges, including land reform, lacking a coherent industry strategy between industry players, and facing competition from SADC countries. The key challenge is how to increase and diversify productivity. Agriculture requires added value to its activities or it could be lost to competing land uses, such as housing and commerce. Hence, shifts to mixed farming, utilizing organic farming practices, are some strategies already being employed by farmers. Existing midstream production includes milling and its offshoots such as molasses and sucrose derivatives. New downstream industries such as biofuels and bagasse could stimulate new technology and value chains into the green economy as well as opportunities for co-generation into the national power grid. Mixed farming provides new opportunities such as pharmaceuticals (e.g. Maringa, cannabis, rooibos, and traditional medicinal plants). The potential linkage to industrial policy, beneficiation, and other government policy imperatives are obvious, but there is little evidence of this in the economic development strategy and District IDP, or that the stakeholders themselves (growers, millers, representative associations, downstream suppliers) have shared strategic objectives.

Another example of potential is that of the digital economy. Several undersea cables are landed at Mtunzini to the north of the Mandeni Local Municipality (SEACOM, SAT-3, SAex and EASSy) that provide international connectivity. Direct access to the cables with manual switches represents the fastest internet and digital economic opportunities to develop competitive advantage of the region, support industrialization and job creation. Currently, neither the District nor Mandeni local municipality have the resources to pursue this, and are dependent on national and provincial imperatives. This also raises the interfaces between districts and municipalities and opportunities regional planning could bring.

The case of informality is a further case. The main activities relate to the taxi industry and hawkers in which the interface between technology, vendors and consumers could intersect more productively, help mainstream, and develop SMME activities. In the main, the planning system is ineffectually engaged with this sector, in particular around mobilizing partnerships to support access to inter-alia finance, information, and markets.

ILembe is also well situated in relation to the EThekwini metro and the broader region, well positioned in terms of transport connectivity including rail, road and air, as well as two ports, suggesting opportunities for co-opetition across government spheres. Possibly the greatest opportunity is the land holding of the area known as Compensation Flats, the last remaining largest segment of flat land at scale, in the Province that could be utilized to develop rail and intermodal structure to support industrial development with major opportunities for employment, creating opportunities for value chains, logistics and supply chains, and innovation. Finally, social capital has long being realized as an important component in addressing common objectives and local problems.

Without the mobilization of a coalition of stakeholders including business, industry, community, informal sector, women and youth around a common vision, economic opportunities would be difficult to realize.

CONCLUSIONS

This paper forms part of early research into regional planning in South Africa. It has shown how spatial planning is being shaped by complex institutional arrangements, competing policy and regulatory dynamics set in a context of intergovernmental co-ordination and co-operative governance. The case study has highlighted some of the complexities of spatial alignment between spheres of government, sometimes resulting in incoherent policy deployment and alignment rather than dynamic interaction with civil society, markets and informality. The District continues to rely on supply side strategies where decision-making is dependent on central and provincial funding support, incentives and subsidies, that current spatial planning instruments do not sufficiently consider the local economy, competitive considerations and the mobilization of economic stakeholders. From the above discussion, it is suggested that the current spatial planning architecture is largely compliance and process driven, resulting in limited ability to engage with economic competitiveness and emerging new capital formations as supported by current industrial policy on the one hand, and increasing social marginalization on the other.

However, successful regions and related theory suggest that regional planning could be a catalyst for collaborative efforts of planning authorities in specific localities to plan, target and deliver resources, close the generation gap in the space economy and allow regions to gain competitive advantage, sustainable development outcomes and positive benefits for communities. Regional planning could potentially lead to policy integration in practice and provide the necessary confidence for the private sector to invest and create new capital, which could lead to competitive advantage and the development of downstream industries. Furthermore, it could be argued that regional planning as a potential catalyst for socio economic transformation in South Africa is untested, and requires further investigation. A limitation of this paper is its reliance on secondary information. Interviews with a wider group of stakeholders are still to be conducted, and forms part of a broader study on regional planning. Furthermore, for the purpose of this paper, the spatial planning documents of the local districts have not been interrogated, and forms part of the wider study.

ENDNOTES

1 The term "co-opetition" coined by Ray Noorda, Founder of Novell, used to define competing and cooperating for business share of market using game theory.

2 For example the recent experience of iLembe Municipality in their application for the redetermination of municipal boundaries in 2012 to the Demarcation Board and indecisiveness of outcomes, and current disputes relating to demarcation processes in Limpopo resulting in widespread protests

3 The MTEF is a multi-year budget framework and supports 3 year rolling expenditure plans for national and provincial departments based on department plans, linked to delivery and affordability, the PFMA provides a framework to design planning and budgeting

4 Enterprise iLembe was established by the iLembe District Municipality in 2009 for the primary purpose to drive economic development and promote trade and investment

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Urban development versus rural development and ruralism in South Africa and Zimbabwe. What the people really want

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Robert Chambers pointed the world to the injustice of the urban bias yet development is often equated with urbanization, industry and technology. It appears then that development theory has also neglected the question of rural development with the assumption that for development to be achieved within rural settlements they must be modernized and urbanized. Countries such as South Africa and Zimbabwe have adopted development policies that promote development in the sense of modernization as opposed to development in a holistic manner. This paper therefore profiles two communities, Empa in Qunu, South Africa and Tsolotsho in Zimbabwe. Qunu follows an urban development paradigm whereas Tsholothso follows a rural development approach. What emerges is that both communities view development differently with both arguing that urban development is not always development and is not what the people want. The paper concludes by proposing a harmonious rural development model that recognizes the unique and specific needs of rural populations and economies without compromising the "rurality" of such settlements through imposing urban and technological development.

1. URBAN VS. RURAL DEVELOPMENT

Over the years the concept of development has, been narrowed down to the idea of massive urbanisation and commercialisation of spaces. This may be the result of the history of development having occurred through modernization. Willis (2011) states that for many people, ideas of development are linked to modernity. Modernization can be seen as the general mechanism by which the social transformation from agricultural dominance to domination by trade and industry takes place, and the permanent continuation of this process (Charlton & Andras, 2003). This is when the traditional sense and function of society is taken over by massive industrialisation, resulting in the abandonment of its traditional and primary activities.

As seen in the industrial revolution of the eighteenth century in Europe, the abandonment of traditional and rural society led to this industrialization (and thus modernization) to be seen as the optimal form of socio-economic development and prosperity. The less developed countries, such as those in Africa and Asia, which industrialised a little later than Europe wanted to follow suit. In the 1950s industrialization was seen as key to progress for the underdeveloped countries (Chambers, 1997:16). "They (the civil servants) want to modernise fast; they rightly observe that rich nations are non-agricultural and that their own agriculture is poor; and they wrongly conclude that rapid industrialization at the expense of agriculture can produce rapid development" (Lipton, 1978: 65). As a result they want rural administration and development. They believe that it is more difficult to plan for thousands of small farms than for a few big urban firms and that planning has little scope for changing rural life.

This has not only resulted in the commercialisation of rural spaces and settlements but also in increased rural depopulation and rural urban migration rates. This is because development and innovation have now been centralized and concentrated within non-rural settings where people found better living conditions with economic opportunities, employment and access to better housing. In his book, Chambers (1983: 4), the author notes the extremes of differences in rural livelihoods to those of urban livelihoods. He refers to this phenomenon

as the "urban bias". In comparing the differences he states that, "At one end there coexist rich, urban, industrialised, high status cores, and at the other, poor, rural, agricultural and low status peripheries." In light of this, this study looks at the development quest with a view to establishing development methods that seek to retain the rural nature of rural settlements and that do not impose the ideals of modernisation in the pursuit of rural development.

The negligence of rural development, particularly amongst developing nations, has become much more evident.. The focus and concentration of development investment on urban centres is evident in the socio-economic gap between rural and urban communities thus creating regional development inequalities where extremes of poverty and massive consumption coexist. "The core problems of widespread poverty, growing inequality, rapid population growth and rising unemployment all find their origins in the stagnation and often retrogression of economic life in rural areas" (Todaro 1997: 296). Rural areas have continuously been placed at the bottom of the development hierarchy. If considered at all, the assumption is always that rural areas must be urbanised in order to be developed. Therefore, this study aims mainly to develop a rural development model that pursues rural development without imposing the ideals of modernism on rural settlements. Instead, it will embrace ruralism by putting the needs specific to rural populations first before those assumed by urbanist and modernist development practitioners.

2. STUDY AREA

The study was conducted in Qunu (Empa), Eastern Cape, South Africa, and Tsholotsho, (Hwange), Zimbabwe. Qunu is located in the Eastern Cape Province of South Africa. It is largely known for being home to the first democratically elected president of South Africa, Mr Nelson Mandela. Qunu is located about 37km South West of Mthatha. It lies on the N1 between Mthatha and East London. Qunu was chosen specifically as a rural area within South Africa that possesses immense potential for liveable rural settlements. It lies along the main route between two major urban centres which would mean better accessibility. It was also chosen because of its historic context and thus tourism potential. However, it is chosen specifically because of the possibility of looking at these potentials being utilized without compromising the rurality of the settlement.

The specific model of development chosen for Qunu was modernist in nature with the construction of a shopping mall within the Qunu area. The mall was constructed with the hope of bringing services, particularly commercial services, to the area while providing possible employment opportunities for local residents. It was constructed by a private developer who was interviewed. The investor responsible was also interviewed. The outcomes of the survey with local residents as well as the specific interviews will be discussed in chapter four.

Tsholotsho is a rural district located in central western Zimbabwe; it lies south west of Harare and 98km northwest of Bulawayo. The name Tsholotsho was derived from the San word "Holohou", which means, "the head of an elephant. The area comprises numerous villages and borders the south of Hwange National Park. Tsholotsho is made up of 22 Wards, each ward consisting of at least six villages. The area has a "Growth Point" which serves as a service centre for commercial, municipal and health services.

The development approach in this area is one of using nature based entities to pursue development. The entity being Hwange National Park and specifically wildlife. To do this, the area adopted what is known as the CAMPFIRE (Community Areas Management Programme for Indigenous Resources) project. The project emerged in the mid-1980s with the recognition that as long as wildlife remained the property of the state no one would invest in it as a resource. CAMPFIRE includes all natural resources but its focus has been wildlife management in communal areas, particularly those adjacent to national parks where people and animals compete for resources. CAMPFIRE begins when a rural community, through its elected representative body, the Rural District Council, asks the government's wildlife department to grant them the legal authority to manage its wildlife resources and demonstrate its capacity to do so. CAMPFIRE makes wildlife valuable to local communities because it is an economically and ecologically sound land use (Tsholotsho Rural District Council, n.d).

3. METHODOLOGY

The study employed a mixed methods case study approach. This was necessary to elicit responses that determine the development trajectory of the two study areas. Similarly, the interpretive research designs and the descriptive explorative design were selected to elicit responses that subjectively describe the developmental paths in both Empa and Tsholotsho. In addition the two designs are appropriate because the paradigms are concerned with understanding the world as it is from the

subjective experience of individuals. The designs employ meaning (versus measurement) oriented methodologies such as interviewing or participant observation, and rely on a subjective relationship between the researcher and subjects.

Questionnaires, interviews and observations were utilized to collect data. These techniques sought to elicit responses on rural development models, modernization and the urban biases in the study areas. To encourage participation and an in-depth response, a focus group discussion was organized where respondents engaged with each other and the researcher on the issues of rural development, modernization and the urbanism. Observation as a technique was also used to note and observe the development in the study areas as well as during the focus group studies. Lastly, interviews with key informant such as administrators and politicians were also conducted.

Data analysis of the questionnaires was carried out in Microsoft Excel where all data was captured, cleaned and summarized. After cleaning, descriptive statistical analysis was conducted to provide a general view of the development trajectories in Empa and Tsholotsho. The analysis focused on the demographic composition, the levels of basic services, the local authority's management approaches, how the residents viewed development and their opinion on the overall development trajectory in Empa and Tsholotsho. Qualitative analysis on these issues was also done using Atlas TI to identify the main themes raised by the residents.

The study period focused on the development trajectories post independence that is; from 1980 for Tsholotsho, and 1994 for Empa

4. RESULTS AND DISCUSSIONS

The Empa findings are presented first followed by Tsholotsho. A general discussion follows before the conclusion is presented

4.1 Empa trajectory

The findings indicate that 30% of the respondents had no access to water. As ilt is often reported that one in three people in Sub-saran Africa have access to proper water facilities, this is not a surprising reflection. This remains a negative reflection. Conversely, there was a general reflection that the respondents have access to basic education, hence the 100% reflection of accessibility of schools. This reflection also isn't surprising, as the United Nations grants that primary school enrolment in Sub-Saharan Africa improved from 52% to 80% between 1990 and 2015. South Africa emphasizes education in its basic human rights as stipulated in the 1996 constitution, consequently there is not much of a difference compared to urban areas

Regarding modernisation, and particularly the impact of modernising Empa through building a shopping complex the responses were interesting. The basic idea behind the initiation of the complex was to create an entity that would bring about employment opportunities as well as to promote Empa, Qunu as a tourist destination. Views from the residents in relation to this idea are that, although employment has been created as a result of the mall development, this has not been permanent and has created few opportunities. As a result over 80% of the residents are employed outside the Empa, Qunu area. Therefore this shows that modernisation does not necessarily bring about employment, nor urbanisation equating to employment opportunities.

The most notable impact of the mall in the area is increased availability and provision of commercial services. Respondents noted that they no longer needed to travel to Umthatha or Viedgesville for services such as automated teller machines (ATMs) (although they noted that they wished that it was not just ATMs, but complete banking branches), hardware stores, salons, and supermarkets. However, the mall developer noted that there are challenges in sustaining the entity, particularly because of infrastructural issues such as road networks' condition, as well as telecommunication connections. Hence modern developments are not the panacea to solving rural poverty and development. Similarly it was also noted that development of the mall was ill conceived as the surrounding area lacks the population and financial muscle to sustain it. Hence the development is bound to fail, further supporting the notion that modernisation does not always equate to development. Perhaps rural focused development approaches such as supporting smallholder farmers or the arts industry could have worked. Therefore this requires a policy shift that does not impose urbanisation or urbanism on residents

Interestingly the residents in Empa agree that it is a liveable area because of their traditional connection to the area. Despite this, 73% of the respondents wish that Empa, Qunu would be a city. With the recent talks of the area being turned into a city because of its historical significance, those who anticipate this believe that the urbanization of the area would imply better lives for them. They assume that the urbanization of the area would bring employment

prospects, better infrastructure and services to them. Yet the mall development has not brought about much change.

4.2 Tsholotsho trajectory

With regards to access to basic services, all the respondents in the survey expressed that there was a viable number of schools in the area. However the respondents noted that state of the roads were in appalling condition which led to poor public transport operation in the area. One has also to note the impact on Tsholotsho of the Hwange National Park, and its CAMPFIRE project involvement. Most of the respondents noted the advantage of having the park with particular reference to the CAMPFIRE project. These advantages include the building of schools from the CAMPFIRE project funds as well as improved knowledge on wildlife management.

Furthermore, unlike the Empa case, the CAMPFIRE project is about natural resources management, with the aim of empowering and benefiting local residents in terms of how these natural resources are used , in this case the wildlife in the surrounding the area. The project provides hunting programs that generate incomes and redistribution of revenues among local residents. What also stood out from observation of the committee meeting was learning that the whole process of the CAMPFIRE project aims to largely involve women in the development processes of their community. They placed special emphasis on women being elected as part of the elected committee. Consequently CAMPFIRES notion of development is rural-based and it notes that for development to occur one does not have to be urban or modernise. This is attested by 60% of the respondents saying that Tsholotsho was a liveable environment because they had access to land, water, schools and health facilities. With such services, however, they also expressed that they wished water was available at shorter distances or that more boreholes were provided. Interestingly, the majority of the respondents (87%) argued that Tsholotsho should be turned into a city. This was largely supported by their general belief that a city would result in better living conditions, employment opportunities, better facilities etc. which again shows their association of development with modernization and urbanism. Nevertheless, when asked what needs to be developed in the area most residents pointed out the need for improved farming infrastructure, management of natural resources and an expanded farming market for the community as a possible development prospect.

5. CONCLUSIONS

From the study it emerges that in Africa and in the developing countries there is the common assumption that urbanisation and modernisation equates to development. This permeates through policy and has resulted in underdevelopment of rural areas as demonstrated in the Empa case. Interestingly it is often perceived that urbanisation leads to development even when evidence suggest otherwise. In both Empa and Tsholotsho residents testify that their rural way of life is sufficient yet they still yearn for urbanisation. Perhaps it is because of the common rhetoric which presents urbanisation as superior to rural development. It is time for governments to realise that rural development should be pursued and not forgotten at the expense of urban development. After all not everyone wants to be urbanised as the people in Tsholotsho testify. What should be pursued is a middle ground policy that seeks to maintain rural development and only to modernise where necessary. This is even more pressing given issues of climate change and sustainable development. It is high time people's perceptions matter. For example people in the winelands region of the Western Cape, South Africa have rejected mining developments and opted to keep their communities agricultural. What the people want as a development paradigm should preside rather than imposing urban development.

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Evolution of traditional boat dwellers'settlements in the process of urbanization in the south-eastern coastal region of China

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The boat dweller is a traditional Chinese clan that lives in narrow boats near the coastal area. Due to the long-term survival on water and rare communication with land residents, the boat dwellers spontaneously constructed the unique settlement form and lifestyle.

After summing up the evolution process of the boat dwellers' settlement from the ancient time to 1950's Land Reform period, the Reform and Open Policy period since 1978 and the urban renewal period in past 20 years, the paper reveals the dilemma between the preservation of traditional water settlements and the developing vision of boat dwellers.

Through a series of case studies, different models of the settlement transformation have been concluded. By comparing similarities and differences, two aspects of problems of boat settlements were further revealed: In the aspect of social economic, unsustainable industrial structures and social problems raised by passive urbanization are the most urgent; while in the aspect of urban space, homogeneous landscapes have appeared around the relocation settlements with the extinction of the traditional settlement characteristics and ethnic spirits.

Then the paper discusses how to improve the current dilemma from the combined perspectives of society, economy and folk culture: the key point lies on the cooperation of government, cultural industry investors and boat aboriginals.

1. INTRODUCTION

The boat dwellers, namely the people of Dan ethnic group in ancient time, is a unique Chinese clan similar to "the gypsies on water", which inhabits a narrow boat space on the flat water surface near coastal area in Guangdong, Guangxi, Fujian and Hainan province. For many dynasties, due to the serious discrimination from land residents, the boat dwellers had to live within their boats and thus obtained a strong ethnic consciousness. The main part of the boat dwellers is a descendant of the ancient Yue ethnic people (Luo, 1978), so they inherit the special characteristics: the narrow boats act not only as main tools for their economic activity, but also as the important living places as well.

The boats have a unique architectural style: In building materials, non-perishable Chinese fir wood with good buoyancy are usually used after being painted on the surface; In building structure, there are two layers below the deck bottom, the lower layer for water proofing and the upper layer is mainly used to pile up food supplies and sundries, increasing the boat's stability at the same time. The function partition is relatively simple: the front cabin for fishing, the middle cabin for eating and resting and the back cabin as kitchen as well as toilet. Boat dwellers with good economic conditions built their main cabin as a small wooden house, with roofs, windows and external decorations; but the poor fishermen have to arrange all family members (including the elderly and children) in only one shabby houseboat. The boat dwellers have formed a unique settlement pattern by adapting the living condition on water, a fishing based industry chain and the corresponding cultural customs have also been fixed from then on.

2. HISTORICAL EVOLUTION OF TRADITIONAL BOAT DWELLERS' SETTLEMENTS

The settlement means a relatively independent geographical space which is composed of a group of people with common social activities, relations and way of life (Yu, 2001). Settlement does not only contains the natural environment and artificial environment after the reform of people, but also

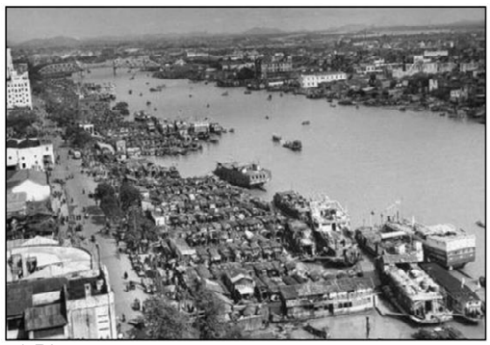

Figure 1. Concentration-type settlement of boat dwellers on Pearl River
Figure 2. Dispersion-type settlement of boat dwellers in Sanshui. Source: Luo Linhu Studio

includes a variety of relationships between the residents and the complex economic and cultural phenomena occurring within the environment (Zhang, 2003). Settlement in the history will continue to develop and update, so as to form a unique context.

The ancient boat dwellers had no choice but boat living due to the limited conditions. For better surviving environment, the location of settlement was generally set in ports or along the riverbank on convenient and safe parking conditions, and the forms of the settlement are of concentration-type or dispersion-type. The inland water settlements are mainly of the dispersion-type which occupy convenient transportation locations in town or in the market place, becoming important places for goods exchange between residents on water and ashore. Coastal water settlements are mainly of the concentration-type: household boats parked directly in the harbor after fishing. Their positions are relatively fixed and connected by wood blocks, which is convenient for mutual aid and conducive to resist the tides and storm (Figure 1 and 2).

During the Northern and Southern Dynasties (A.D.439) to the Ming Dynasty (A.D.1644), the boat dwellers in Guangdong and Guangxi started to build free-style shacks and water column connected with their boat at the edge of water surface to strike back serious natural disasters, which became a significant transitional form for them to change from boat dwelling to settling ashore (Wu and Situ, 2011). Shacks were generally built by the sea or river land, using bamboo and straw as walls and roof; the indoor layout was as simple as the boat (Figure 3).Water column in the grass huts supported by wooden pillars in the water(Figure 4). When the strong typhoon or flood attack boat dwellers' settlements, such humble shacks and water column are often destroyed or severely damaged. Therefore, the seeking for a more stable residence has become an inevitable trend for boat dwellers (Xu, 2012).

After hundreds of years' of painstaking work, the boat dwellers gradually gathered to form little villages in the coastal and riparian area to live a semi-farming and semi-fishing life. In the early 20th century, boat dwellers in Lisha Island of Fujian started the foreshore reclamation: at first there was a vast expanse of water and the only beach could hardly grow crops due to salinization, after the boat dwellers' land reclamation and arrangement of aquaculture, the former wasteland became waterfront village for amphibious residents.

Figure 3. The shacks of boat dwellers in Shatian, Guangzhou before liberation. Source: Government of Shatian County
Figure 4. Water column in western suburb of Guangzhou in P.R.China period. Source: Luo Linhu Studio

Figure 5. The household boat poured by cement in Guangdong. Sources: Li Yuxiang's photograph

3. EVOLUTION OF TRADITIONAL BOAT DWELLERS' SETTLEMENTS IN THE PROCESS OF URBANIZATION

To sum up, before China's entering the urbanization process, the settlements of boat dwellers on shore were in form of clutter; layout of humble shacks and water column was messy; living conditions were still harsh and under risk of disasters.

After the founding of P.R.China, the modern urbanization process began. The Land Reform Movement in the 1950s historically insured the boat dwellers to obtain the access to land for building. Local governments have introduced policies to abolish the discrimination to boat dwellers and arrange them to living ashore in newly-planned villages of the coastal area. At that stage, the gap between urban and rural areas was not big enough to generate the thrust to push the large population from rural to urban, so the vast majority of boat dwellers continued living on water or amphibiously. Settlements of concentration-type or dispersion-type still exist. Thus at the same time, the immovable household boats poured by cement appeared: beds, cabinets and other modern furniture such as liquefied petroleum gas stoves were all equipped. They functioned similarly as the land house except for fixing on water (Figure 5). The impacts of winds and waves were weakened, and the life stability was enhanced.

After the Reform and Open Policy in 1978, with the rapid development of China's urbanization process, the labor-intensive industry of urban area has generated strong demand for rural labors, and the boat dwellers no longer need to all stay in the boat for fishery operations due to the improvement of efficiency, which has led some boat dwellers especially the young generations to work ashore for more incomes. Unified planning of fishermen village has become the mainstream of settlement during this period: the architectural style was mainly 2-3 storey cottage in unity. For example, in Xincun county of Hainan province, the house boat dwellers held after settling ashore was generally referred to as "long house" (Figure 6): as high as two to three layers, the house has two lobbies at two ends and the middle strip is separated into several small rooms, leaving a one-meter-wide corridor on the left(Liu, 2011). This is because there usually lived several households in just one boat when the residents were on the water, so the government divided the land to boat dwellers as the pattern of long blocks. Each family could build and

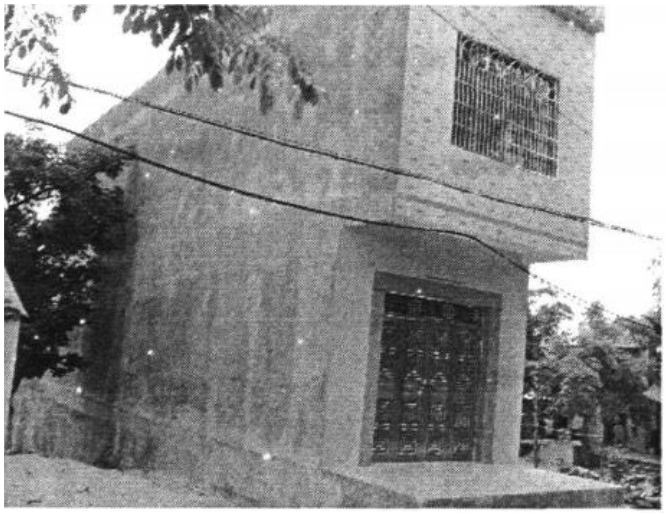

Figure 6: The "long house" built by boat dwellers after settling on land in Hainan Province. Sources: Liu, L. (2011) Fate being bound by water, Minzu University of China.

Figure 7. Transformation of the settlement texture from 2003 to 2013 in Lisha Island. Source: Google Earth

separate their house according to the number of their offspring. Several rows of the long house seem just like several three-layers ships getting close to each other, becoming the unique symbol for boat dwellers and from the psychological significance, acting as the reconstruction of their lives on water.

Since the 1990s, local governments in southeast China have strengthened restrictions on the administration of coastal boats as well as strongly encouraged boat dwellers to settle ashore for the benefit of urban landscape and public health, and soon the boats on water were almost extinct(Li, 2009). At this time, the living standard and education quality of the boat dwellers have been greatly improved as compared to the past. After living ashore, the boat dwellers took jobs as workers, businessmen, farmers or still fishermen engaged in fishing, aquaculture and water transport. Besides, government sometimes provided employment support and economic subsidy for them. Urbanization has promoted land prices, for saving the expenditure, during this period the fishermen villages provided by government are multi storey buildings or high-rise buildings in unified styles.

But almost at the same time, the land prices rising again has caused the boat dwellers to face the second relocation even if they had just settled down recently. Taking Guangzhou as an example, in 1994, development of Ersha Island started; this area soon became a symbol of wealth and power and attracted developers. After being the most expensive place in Guangzhou, the fishermen aboriginals living here and their boats were forced to move away again from where they just built a common memory of living. The boat dwellers are always giving their way to the urbanization, always living at the margin of the city from past to now.

No matter settling ashore actively or passively under the guidance of government policy, the boat dwellers still belong to the vulnerable groups due to the forced change of life style and constraints of working mode. How to improve the living standard of them and preserve the traditional culture at the same time under rapid economic development and urbanization process has become a severe problem to be solved.

4. MODES AND CASE STUDIES OF THE BOAT DWELLERS' SETTING ASHORE

4.1 The mode of passive relocation—boat dwellers in Lisha Island, Guangdong (Figure 7)

The Lisha island is surrounded by the sea and was formed by the foreshore reclamation. For many years, the traffic is inconvenient, so every household had to keep the boat for transportation. New houses are built on land, while the old water column and shacks were near the water, what was worth mentioning is that several elderly residents still live on the boat for years. After Humen Port Planning's being published in 2003, Lisha island has been positioned as fine chemical industry park and high-tech industrial agglomeration area instead of the former ecological tourism village, causing a total of 1.1 million people to migrate and relocate

Figure 8. Water column in the background of chemical industry park. Source: http://blog.163.com/dgcdc@126/blog/static/106150519201071111590222/

Figure 9. Transformation of the settlement texture from 2003 to 2015 in Shapowei Bay. Source: Google Earth

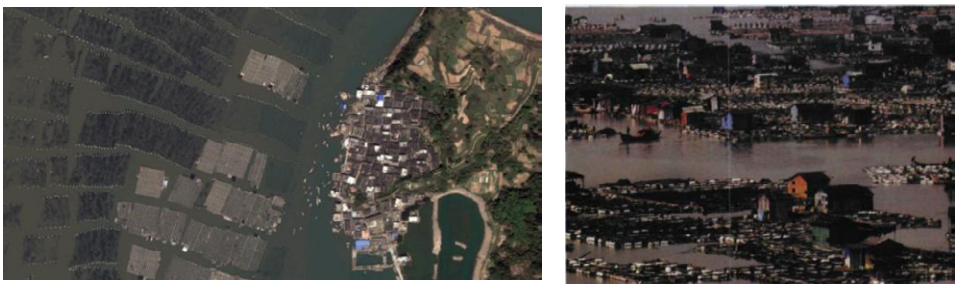

Figure 10. Settlement texture and scenerty of Xiapu. Source: Google Earth and Shan Huajie's photograph

in high-rise buildings. Under the background of scaled petrochemical base, the original ecological rural landscapes are disappearing (Figure 8): large banana plantation, sugar cane forest and fish pond are replaced by factories and storage tanks. The traditional local emotions and confusions about the unknown future make aboriginals want to stay; however, the potential security and health problems caused by chemical industries have become the main anxiety cause for people's leaving.

4.2 The mode of leaving a "culture sample" - boat dwellers in Shapowei Bay, Fujian

The Shapowei Bay was used as a dock for fishing boats at the very beginning, but ever since the Yanwu Bridge was opened to traffic, the bay has lost its original function. Besides, the primitive living conditions of boat dwellers have caused a number of environmental pollution and fire hazards. Since June of 2015, Shapowei Bay has been closed for remediation with the planning suggesting there will be no more reserved living boat, leaving only a few boats for entertainment. As a result, the historic traces boat dwellers can leave here are just several marine culture antiques and videos displayed in little museum. It will be difficult to appreciate the original waterfront symbiotic multicultural scene again (Figure 9).

4.3 The mode of exclusion zones - boat dwellers in Xiapu, Fujian

Xiapu is located in the eastern part of South China Sea, and the winding coastline is an advantageous condition for fishing culture. Under the support of the local government, part of the sea was designated as an exclusive breeding area; countless cages for fish, bamboo rafts and boathouses are connected together. Such fishing villages on the sea have existed for more than 20 years like a low-rise city on land. Contiguous colorful boats act like single buildings and fishing vessels and waterway act as streets. The boat dwellers also obtain houses on land, but they are more accustomed to living on the sea because their main industry is fishing and breeding. Especially, this unique style of life and production has generated the heat of tourism: many tourists are attracted to come here in order to experience the charming scenery and the lifestyle of boat dwellers (Figure 10).

4.4 The mode of folk culture village combined with tourism - boat dwellers in Waisha Island, Guangxi

Waisha Island is in the north of Beihai City of Guangxi, only dozens of meters away from the land. The bay of Waisha island was inhabited by the local boat dwellers until 1950s (Figure 11). Later, some bamboo-made high-feet shacks were also built by aboriginals in the nearby beach. In recent years,

Figure 11. Transformation of the settlement texture from 2003 to 2015 in Waisha Island. Source: Google Earth

Figure 12. Weird European architectural style with no connections with Chinese traditional culture in Waisha Island. Source: Baidu Photograph

the island has been developed and reconstructed by large funds, lots of folk culture villages rose straight from the ground. However, the operations of culture villages lacked overall planning, with only seafood stands offering same foods and drinks and the shore resorts providing accommodation. Even the resorts are of South Asian and European styles (Figure 12), which shows no connection with the traditional folk culture of boat dwellers and thus lead a complete loss of the inheritance of the characteristics of traditional settlements as well as the historic heritage.

5. THE PLIGHT FACED WITH BOAT DWELLERS AFTER SETTING ASHORE

5.1 The social economic aspect

5.1.1 Unsustainable industrial structures

Under the background of the damage of marine ecology, depletion of fishery resources and the rapid development of transportation industry, it seems like the collapse of boat dwellers' fishing industry is inevitable. Due to the primitive civilization level and hesitant ways of doing things, most boat dwellers find it difficult to adapt to the complex changes in current economic situations. However, even they can hardly manage their daily lives, many elderly boat dwellers still choose continuing their fishery related work and reject the work on land; while educated young people realized they cannot rely on the sea all the time, so they turned to low-technology-level works such as porters, the rickshaw pullers, fishmongers etc. They have given up their unique cultural characteristics in order to take the expediency of getting rid of marginalization (Wu, 2010). In such situations, the industrial structure of boat dwellers is very fragile and unsustainable: the tertiary industry shares are very high, but the majority are the low-end service jobs. Relatively, the secondary industry which can create jobs just accounted for a low ratio, which is very unfavorable for the whole group's development. Take Xiapu mentioned above as an example, the proportion of the three industry structure is 28.6:31.9:39.5 in the year 2014. If there is no improvement about the industrial structure, peoples' living standards are difficult to be raised.

5.1.2 The economic and social problems raised by passive urbanization of the boat dwellers

Passive urbanization refers to the phenomenon that although the residents do not want to be urbanized or haven't yet prepared, they are forced to abandon the mode of agricultural production and rural lifestyle to be integrated into the city due to various objective reasons (Zhang and Gu, 2006). In most cases, the relocation behavior of boat dwellers is the result of land expropriation or landscape improvement, those aboriginals who are in favor of the lives on water have permanently lost the quiet homeland.

Such phenomena often happen in the process of relocation: the compensation standard is not appropriate: the resettlement houses are not provided; urban social security system is not sound; the re-employment problems of boat dwellers are difficult to be solved, which all great harm of their benefits. Apart from the institutional reasons, many personal factors also add to the life difficulties: due to the unemployment, income has not been increased while the boat dwellers' cost of living has been in a rapid rise; part of the water residents hold a fear, rejection or even offensive attitude towards the land society, and thus they have problems to integrate into the society in short term. It might be even worse when these people gradually lose the interest in regular work, which will trigger a series of social problems afterwards.

5.2 The urban space aspect

5.2.1 The relocation settlements with homogenization

The resettlement houses for boat dwellers on land are mostly built in the past ten years, dozens of high-rise buildings have sprung up in cheap lands; the housing style is doomed to be stereotyped and boring due to the high construction speed: similar elements piled up to the buildings to form a large scaled apathetic settlement, with homogenization and without beauty.

At the same time, the boat dwellers did not really realize the goal of settling into the lives on land: most of them are not used to the elevator in high-rise buildings and still look forward to a countryside lifestyle. The Lisha boat dwellers as mentioned above, developed the open space under the fence of the residential side gate into farmland planting fruits, which adds a piece of dramatic rural landscape in urban area.

5.2.2 The extinction of the traditional settlement characteristics and the group spirits

The majority of the boat dwellers especially the younger generations will try to fit in with the so-called "mainstream culture" and abandon their original cultural identities after settling into nearby cities. Unique waterfront settlements and their traditional clan temples are gradually disappearing; the diversified cultures like "salty water songs", costumes, foods, dances, special fishing methods of boat dwellers are also on the verge of extinction, which will certainly be a regrettable loss for the regional history and culture.

6. PROSPECTS: THE STRATEGIES OF THE INHERITANCE OF TRADITIONAL BOAT DWELLERS' SETTLEMENTS IN URBANIZATION PROCESS

For thousands of years, the boat dwellers have experienced from living on water to Amphibious living and then settling ashore, so the settlement patterns and characteristics have been evolved correspondingly. After entering the 21st century, an increasing number of boat dwellers move ashore actively or passively under the background of rapid urbanization. Through an analysis of different models of this transformation, this paper focus on discussing explicit and implicit problems about the extinction of traditional culture in passive urbanization of boat dwellers, and put forward some methods for better inheritance of traditional settlement: the key point to increase the living standard of boat dwellers as well as inherit their unique cultures proves to be the cooperation of government, cultural industry investors and aboriginals.

The government should try to improve the relocation subsidy policy, at least ensuring the supply of resettlement housing for boat dwellers; secondly, the issues of port environmental protection and education popularization which are conducive to sustainable development should be put on the agenda. In addition, more attentions should be paid to the tourism major in local colleges and universities especially the curriculum of folk customs and culture contents, to train qualified professionals in folk tourism and heritage preservation as well as avoiding the vulgarization and marginalization about the water culture (Zhang and Zhang, 2008).

For boat dwellers, the most important point is to raise the sense of innovation to attract high added value investment such as aquatic product processing and custom tourism to achieve the sustainable development of the industrial structure. It should be encouraged for residents to attend various innovative industry groups under the guidance of the government, and their main goal is to protect and then carrying forward the traditional culture such as the operations of authentic folk villages and special aquatic products processing and export.

Hopefully, the above strategies can realize the inheritance of the cultural context and explore the possibility of unique new forms of settlements inhabited by traditional boat dwellers under the backdrop of urbanization in the new era.

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