Integrating urban communities for sustainable cities

Young Planning Professionals Workshop (YPP) of the International Society of City and Regional Planners (ISOCARP)

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Integrating Urban Communities for sustainable cities
Lang’ata area | Kibera | Nairobi

ISOCARP
Knowledge for better Cities

The Architectural Association of Kenya

UN-Habitat
For a better urban future

City Council of Nairobi

University of Nairobi

Government of Kenya
# Report YPP workshop 2010

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Young Planning Professionals
Planning for Kibera

Over a concentrated period of three to seven days, the YPPs work in closely-knit international teams, exchanging ideas and learning from each other. The workshops thus provide a synergic platform where new ideas and creative solutions to complex and multifaceted urban issues are produced. The tangible results are then published in a Workshop Report. The intangible ones, however, stay in the hearts and minds of the participant YPPs, who not only learn from each other but often become life-long friends.

In 2010, ISOCARP celebrated the 20th Young Planning Professionals Workshop Anniversary during the 46th ISOCARP Congress in Nairobi, Kenya.

YPP workshop Kibera

The theme of the Young Planners Professionals Workshop was the integration of Kibera, one of the largest informal cities in East Africa, into the surrounding neighbourhoods of Nairobi City. Kibera is located about 5 miles from the city centre. This informal city houses between 170,000 and 1.2 million people. Conditions in Kibera are extremely challenging for the inhabitants because of poverty and lack of access to basic services like running water and electricity.

After the independence of Kenya in 1963 the government declared certain forms of housing illegal, rendering Kibera an official unauthorized village. Over the years the inhabitants of Kibera increasingly rented out their properties to more tenants then were permitted by law. The rent in Kibera is very low and this attracted even more inhabitants, predominantly impoverished immigrants. In order to improve Kibera and transform the informal city into an integrated neighbourhood of Nairobi, various upgrading programmes have been started by the Kenyan government and UN - Habitat. These programs are aimed at improving living standards within the neighbourhood and improve the connectivity with Nairobi.

Programme YPP - workshop 2010

The main objective of the YPP workshop was to integrate Kibera in a sustainable way into the urban fabric of Nairobi. The study area was chosen to be an area of approximately 5 square miles located along the Ngong River and Nairobi Dam and about 10 km from Nairobi City Centre. The project area covered the informal city Kibera with its low income housing area including the Nyayo High-rise residential flats and Langata Road with adjacent residential neighborhood of Dam Estate Onyonka, Otiende and Rubia.

Kibera originated when Nubian soldiers returning from the First World War were awarded plots of land, by the British colonial government. In the forests outside Nairobi. The colonial government allowed the settlement to grow informally because of the Nubians’ service as soldiers in the Allied Army in the First World War.

In order to integrate Kibera into Nairobi the Young Planning Professionals where divided into 5 working groups, each with a specific thematic area. Urban networks & community development had the task to research how to promote the integrated development of Kibera and improve the accessibility and connectivity. The second group dealt with infrastructure and mobility. This group had to design a creative infrastructure and mobility strategy that would increase opportunities for the inhabitants.

Presentation

The results of the five working groups were presented on the opening day of the 46th ISOCARP congress hosted by the Architectural Association of Kenya, together with several Kenyan Government ministries, the Nairobi City Council and UN Habitat, the auditorium of the UN Habitat Campus, where the opening day of the congress was held, was packed with some 800 planners and other professionals from all over the world. The Prime Minister of Kenya, Raila Odinga opened the congress. He and his ministers gave a powerful introduction of the needs of their country, of the challenges presented by migration to Kenya’s urban areas, of the daunting task of tackling inequality and of the need to reverse environmental degradation.

Over the last 20 years, ISOCARP has organized many YPP workshops, but this presentation of the YPP workshop had the biggest audience of all. Through the technical tours organised by the Local Organising Committee, many delegates had the opportunity to see Kibera, Africa’s biggest slum settlement, for themselves and to view the huge contrast between the wealth of Nairobi’s central area and this massive district where the very poorest people live. The ideas presented by the five groups of Young Planning Professionals coincided with five big ideas for achieving sustainable cities that were identified by the General Rapporteur of the 46th ISOCARP congress. These were defined as integration, resilience, economic growth, a dialogue with traditional urban design and built form, and flexibility and adaptability of planning instruments.

Hearts and minds

Young Planning Professionals workshops are great adventures for the mind and the soul. With their bright and outside-the-box ideas, the workshop participants bring hope to often-difficult planning issues and they provide confidence that planning problems are there to be solved and can be overcome. The participants of the YPP workshop in Nairobi came from all over the world. Most of them have not met each other before. Within hours after visiting Kibera and meeting the people of Kibera, they worked with an enormous energy and passionate drive. We got the spontaneous support of the many Kenyan students who worked with us for three days and nights. The presentation of their findings on the opening day of the ISOCARP congress, in front of hundreds of planners and eminent guests at the UN Habitat Headquarters, went very well and provoked discussions. Hopefully, the findings of the Young Planning Professionals workshop are useful for the future of Kibera. One thing I am sure of: Kibera and Nairobi will never leave the hearts and minds of the Young Planning Professionals.

It was a privilege to be one of the 2010 YPP workshop coordinators. I thank our host, our strategic partners, the ISOCARP YPP Vice President, my fellow workshop coordinators, the YPP students and the YPP volunteers who made this workshop a success.

Martin Dubbeling, 2010 YPP workshop coordinator

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Urban networks and community development

Integration and governance

The informal settlement of Kibera physically and socially can be characterised as an ‘island’ only partly connected to the broader urban area of Nairobi. Exchanges and flows are only one-way, i.e. Kibera’s inhabitants are working in the city’s industrial areas, in the housing estates of the surrounding middle and high-income neighbourhoods or commute to the city centre for recreational purposes. Mobility flows from other Nairobi areas to Kibera on the other hand rarely exist. Furthermore Kibera is not a homogenous entity but divided and fragmented especially between ethnic groups. Lack of exchange and cooperation between these villages (referring to the 13 quarters of Kibera) has triggered conflicts in the past, among these the recent post-election violence. Integration of Kibera both into the urban network of Nairobi as well as internal integration are thus major challenges.

Kibera is the location of a large number of interventions from the Government of Kenya, UN-Habitat and donors to NGOs and smaller scale organisations. To a large degree community development and upgrading have been funds-driven rather than originating from grassroots initiatives. This raises the question of how adequately represented the community is in the current internal governance structure. The challenge is to ensure the inhabitants’ ownership of community development processes in order to achieve sustainability of approaches.

Objectives and approach

The aim of this project is to identify the potentials of Kibera which can be built upon for integrating Kibera with the city of Nairobi and surrounding neighbourhoods as well as the villages of Kibera with each other. Two sites visits of the village of Soweto East including discussions with members of the Settlement Executive Committee and interviews with seven community members provided the background for this studio work. The approach follows three levels to be integrated with each other:

- The cultural and economic community assets: how can the cultural and economic community assets be utilised and developed for integration purposes?
- The governance structure and community participation processes: how can the current governance set-up be enhanced to deliver a sustainable integration process?

The integration will be on three levels: between Kibera and the city of Nairobi, inside Kibera including the surrounding middle-income areas and Nairobi Dam, and in the village of Soweto East with its neighbouring two villages and adjacent middle-income areas.

The project group is aware of the current KENSUP projects of community upgrading. However, the proposals below are based on the currently existing settlement structures and we would like to propose a renewal process that will be taken so far with the aim to preserve existing community assets, especially with regard to economic small-scale activities.

Integration of Kibera within Nairobi

Problems and potentials

The existing road network in Kibera is currently a disjointed grid with only a few roads and footpaths traversing the whole area while the majority of access links are cul-de-sacs. Buses and matatus stop only on the edges of Kibera without going inside thus seriously hampering accessibility. One interviewee operating a carpentry shop informed us that he must bring heavy materials by manually operated pushcarts because the current access network does not allow easier modes of transport. The rivers and streams going through Kibera are currently open sewage canals, however they reserve linear public spaces and thus provide potentials for an enhanced network of public spaces, especially footpaths. The 13 villages of Kibera are fragmented with respect to ethnic groups and only little exchange exists between them, as confirmed by the interviewees. However, there have been projects in the past strategically placing facilities, for example sanitation blocks, on the village boundaries to enhance cooperation through the facility management committees.

The governance structure within Kibera and its villages is very diverse with internal informal structures and we would like to propose the following structures to the new Southern Bypass.

Proposal

To enhance the accessibility of Kibera the currently unconnected grid will be transformed into a connected network by extending cul-de-sacs to meet the adjoining paths and roads. A central road will connect Kibera with its surroundings as well as the villages within. Along this central ring road linkages to the surrounding road network and bus and matatu services will be introduced. Once the problems of water and sanitation have been solved these linear public spaces along existing streams and rivers could be developed as green recreational routes and connect to the lake through footpaths.

Integration of Kibera and surrounding neighbourhoods

The existing road network in Kibera is currently a disjointed grid with only a few roads and footpaths traversing the whole area while the majority of access links are cul-de-sacs. Buses and matatus stop only on the edges of Kibera without going inside, thus seriously hampering accessibility. One interviewee operating a carpentry shop informed us that he must bring heavy materials by manually operated pushcarts because the current access network does not allow easier modes of transport. The rivers and streams going through Kibera are currently open sewage canals, however they reserve linear public spaces and thus provide potentials for an enhanced network of public spaces, especially footpaths. The 13 villages of Kibera are fragmented with respect to ethnic groups and only little exchange exists between them, as confirmed by the interviewees. However, there have been projects in the past strategically placing facilities, for example sanitation blocks, on the village boundaries to enhance cooperation through the facility management committees.

The governance structure within Kibera and its villages is very diverse with internal informal institutions (village elders, community self-policing), internal more formalised institutions (Settlement Executive Committees, FBOs, CBOs, Youth Organisations) and external organisations (Government of Kenya, UN-Habitat and donors, NGOs). These existing structures are a strong asset, however, the different institutions and projects have not been integrated adequately and the communities seldomly were the ones initiating community development processes.

These are located close to the Toi Market and Laina Saba Market in order to harness their economic potential as entry points for promoting two-way exchange and flows. Furthermore connections to the main roads will be enhanced, including connection to the new Southern Bypass.

Proposal

To enhance the accessibility of Kibera the currently unconnected grid will be transformed into a connected network by extending cul-de-sacs to meet the adjoining paths and roads. A central road will connect Kibera with its surroundings as well as the villages within. Along this central ring road linkages to the surrounding road network and bus and matatu services will be introduced. Once the problems of water and sanitation have been solved these linear public spaces along existing streams and rivers could be developed as green recreational routes and connect to the lake through footpaths.
Implementation mechanism

part of the jury and implementation committee. Here the existing organisational assets of Settlement Executive Committees, FBOs, CBOs and youth organisations will be utilised and integrated to find the appropriate design solutions (see figure above).

Internal integration in Soweto East

Problems and potentials
Currently a main road is under construction in the village of Soweto East that will traverse through Kibera. This road and the railway line are the physical networks that could be utilised and enhanced for integration. Valuable community assets include the market and hawking area along the railway tracks, as well as a smaller site along the road under construction. Along the slope connecting the road with the railway line – currently a sewage stream and a footpath with some open spaces in-between – a number of community-based organisations will be located, some of which are youth organisations and others are involved in waste management and urban agriculture.

Proposal
Within the area of Soweto East there will be three strategic nodes located at the newly introduced bus stop, the railway stop and at the location of the main church. The main road network as well as the area around the new train station will be a potential area for development and consolidation of markets and small-scale hawking. In order to overcome existing boundaries between Kibera and the surrounding middle-income areas we propose to open access especially via the railway stop, the bus stop and towards the Nairobi dam. Once the Nairobi Dam has been rehabilitated this will serve as a recreation area for all citizens of Langata and thus realise its potential as a shared public space to integrate Kibera and the surrounding middle-income residential estates on Langata Road.

Conclusion

The group acknowledges that in order for implementation of the proposed interventions to be realized at the local level, political will from the government will be a vital requirement. Furthermore, regulations will be needed for the development of the proposed physical networks as well as incentives for the developers will need to be achieved. The strategic location of the proposed community facilities will further enhance the community’s assets and contribute towards the community’s overall development.

In relation to the governance and participation of the community a planning commission is hereby proposed which integrates participants from within the community. Co-operative finance schemes are considered as being instrumental to the development process alongside enhanced civic engagement within the Kibera community.
Infrastructure and mobility development

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Infrastructure and mobility development

Introduction
Kibera faces many challenges when it comes to its basic infrastructure, both with regards to sanitation and utilities such as water and electricity, and transport. Infrastructure developments are often problematic due to the huge financial and physical capital required to implement them. However, this report suggests a number of simple, small-scale upgrading solutions which can be implemented with immediate environmental and health benefits, as well as longer-term solutions to ensure Kibera residents are well-connected to Nairobi.

Existing infrastructure conditions in Kibera
It is generally agreed that the minimum level of basic services for human settlements should include:
- all-weather roads
- access to safe drinking water
- area-wide storm-water drainage
- hygienic toilets
- hygienic disposal of domestic waste water
- all of the above services are sorely lacking in the Kibera area.

The access road network in Kibera is in poor shape. So far, only the first 500 metres of the access road have been completed, by the government and UN Habitat. The spatial organisation of the structures is haphazard, resulting in footpaths that are very narrow and winding in nature. These paths are also difficult to use during rainy seasons due to the mud and open sewers which spill onto them.

The exception is the main road into Kibera that has recently been opened up but is yet to be completed. The Kenya-Uganda railway traverses the slum. The railway reserve however (30 meters on either side of the railway line) faces serious encroachment by structures and open air businesses.

Approximately 28% of all house structures in Kibera have been completed, by the government and UN Habitat. The spatial organisation of the structures is haphazard, resulting in footpaths that are very narrow and winding in nature. These paths are also difficult to use during rainy seasons due to the mud and open sewers which spill onto them.

There is no official method of solid waste disposal, and the residents mainly use open sewers or dump wastes into the rivers. 75% of the residents use pit latrines at a fee of Ksh. 3 for use but these toilets are inadequate, forcing some residents to resort to using polythene bags for human waste disposal (flying toilets). This lack of sanitation poses serious consequences for the health of the residents of Kibera, particularly for children who may play in the midst of the waste.

The majority of residents (98%) of Kibera buy water from water points or water vendors for use in their households. This water is sold at an average cost of Ksh. 3 for a 20 litre jerrycan.

Due to the high cost of formal electricity connections, the majority of the structures have illegal electricity connections. These connections illegally tapping electricity from the formal electricity lines are extremely dangerous and therefore increase the risk of fire within the informal settlement. Therefore, the existing conditions in Kibera are far from meeting the desirable minimum standards for a healthy and safe living environment.

Opportunities for infrastructure improvement in Kibera
Despite the dire conditions of infrastructure facilities in Kibera, particularly regarding sanitation, there are many opportunities to take simple steps to improve these conditions while at the same time offering economic opportunities to the residents of Kibera. Listed below are existing “features” of Kibera which could be better exploited for the benefit of the slum residents:
- the Kenya-Uganda railway line
- the main access road currently under construction
- the Ngong River
- the existing sewerage system
- solar energy
- waste as a resource.

A community-driven approach to change
One of the most effective methods of improving infrastructure conditions is through community-driven approaches, which can at least guarantee quick results without waiting for international agencies to offer top-down assistance. Community-driven approaches also offer the benefit of addressing exactly the community’s needs, as a demand-driven approach which can specifically target key areas as identified and prioritised by the residents themselves.

Additionally, by taking action for themselves, the community will also have proven solutions to demonstrate to funding bodies and government agencies, for the further scaling up of activities. Community-driven approaches can be kick-started by organizing the residents into savings groups. Savings groups are an effective method of building trust within community groups, as the savers collectively manage their group’s savings together.

It is important that savers save with a goal in sight, such as to build a communal toilet, so that there is a purpose and motivation for saving. Additionally, by pooling their resources, the members will be better able to leverage additional funds from other agencies, such as the Pamjaa Trust, SDI, and the Umande Trust.

Savings group members can also form a network of savings groups within Kibera, to share ideas for activities in the slum, as well as create liaisons with savings groups outside Kibera, as a federation of savers. This federation has greater negotiating power in the face of authorities than individual groups would have.

Innovative solutions to the problems in Kibera
Small-scale upgrading, in anticipation of future re-development
The short term solutions proposed below can be implemented by well-organised communities, at a relatively low cost which could be fully or partially financed by community savings, or with leveraged finance.

Internal accessibility within Kibera
As highlighted earlier, while a main access road is under construction, there is little by way of clean, flood-resistant pathways for pedestrians inside Kibera. Paths generally snake alongside open sewers. The proposed solution is to enclose the existing sewers and storm drains using concrete paving slabs, as illustrated.

The paving slabs can easily be made and laid by the slum residents themselves, with a little training in the use of raw materials. If a number of savings groups gather together to implement this plan, they can buy raw materials in bulk and thus at a lower cost.

The proposed solution also offers the added benefit of saving space by combining pathways and sewers in one. This solution would need to be combined with raising awareness of proper rubbish disposal in order to avoid clogging of the enclosed sewers with plastic bags and other materials. The outcome is improved sanitation conditions as sewers are enclosed, with environmental benefits for the reservoir into which sewage drains, and less rubbish will contaminate the waste water. Accessibility and mobility also improves, for the overall benefit of Kibera residents.

Sanitation and energy
As highlighted above, 75% of Kibera residents rely on pit-latrines for which they have to pay to use. Alternatively, they may use “flying toilets”. Many community residents rely on illegal electricity connections in order to power their homes.

The proposed solution is to combine pit latrines with power generation, by installing a greater number of communal bio-toilets with solar panels. UN Habitat and the Umande Trust have already installed community-run bio-toilets which serve as energy centers in certain locations in Kibera, and the key is to make them more widespread. The energy generated by biogas by solar panels can be used to power community generators and/or community kitchens.

Finance: The cost of purchasing the raw materials for making concrete slabs can be lowered by bulk purchases by a number of savings groups together. The residents can make the slabs and lay them by themselves, thus keeping the cost of the whole process very low. This solution would also provide a possibility for CSR by concrete-producing companies – they could provide the raw materials to the savings groups, and could also include the company logo in the concrete slabs.
A small fee can be charged for the use of the toilets, as well as for the use of cooking gas or power generated by the centre, and this centre can be community-managed by local residents.

The outcome is that household clusters will be able to access clean pit latrines, as well as a clean energy source for cooking or power generation.

This also has environmental benefits, and in the long term could generate funds for community projects. Ideally, the location of these communal energy and sanitation centres will take into account future redevelopment plans for Kibera, so that they can be located next to planned markets, for example.

Finance and implementation: as with the existing bio-toilet facilities, NGOs and international agencies could facilitate the construction of further facilities. The use of community labour can help keep construction costs low, whilst also providing the labourers with construction skills.

As the toilets and kitchens will charge a pay-per-use fee, the facility would eventually become self-financing.

Integrating waste collection and access

Currently, the main access road of Kibera is only 500m long and has yet to be completed by the Government of Kenya. Additionally, the Kibera area has no waste collection facility, which means that the area is strewn with rubbish.

The lack of waste collection is not facilitated by the poor access into the area. The proposed solution is to integrate the completion of the access road with a municipal waste collection service.

If the access road is complete, garbage collection vehicles will be able to enter the area and pick up waste from designated collection areas, points at which residents will deposit their waste for collection.

These waste collection areas would be semi-enclosed hubs, built of concrete, for easy hosing down when necessary.

It will be necessary for Nairobi City Council to make waste collection in Kibera part of its service, and this waste collection service could be integrated with a youth employment scheme for Kibera youths, hence creating a source of livelihood.

Integrated area development and area capture

One of the problems facing Kibera is that it is not regarded as a priority area for investment, as it is regarded as a poor “ghetto” and too big a problem to tackle. However, if this opinion continues, the residents will never face major improvements in their infrastructure, apart from the improvements they can make themselves through their collective actions. The lake nearby to Kibera was used as a leisure centre up until a few decades ago, when the water quality deteriorated.

The proposed solution is to build upon the small-scale upgrading solutions implemented by residents, and the consequent improvements to the environmental quality of the nearby lake, in order to transform the lake into a leisure destination.

By attracting big-name, high-end investors, such as a luxury hotel brand, the necessary infrastructure improvements will follow. The lake environment could be returned to its original form, making it a pleasant place for Nairobi residents to enjoy leisure activities such as sailing and biking. The proposal is that the area be developed as a socially responsible resort, with the possibility of an adjoined hospitality school which could provide training to the residents of Kibera, while the hotel could employ staff from Kibera.

The outcome: this proposed solution is a method of capturing the value of the investments made by Kibera residents in their infrastructure and environment, with its consequent beneficial impacts on the environment of the nearby lake.

It will also provide employment opportunities for local residents, while attracting large-scale infrastructure improvements as part of the hotel and leisure area improvements.

Finance and implementation: it will be possible to capture predicted future profits of the hotel through private bond and equity placements to pay for the infrastructure and lake upgrade. This project will be a large-scale investment and therefore would be a longer-term proposal for the area.

Pro-bike transport solutions

The majority of Kibera residents rely on walking as their main method of transportation, with cars being financially out of reach as well as impractical due to the lack of roads within Kibera. However, bicycles are accessible by a large number of Kibera residents, and bikes should be promoted as a faster method of transport, for the benefit of all the city’s residents, not only those of Kibera.

Finance and implementation: political will on behalf of the city’s government to take this innovative and bold step to become a bike-friendly city will be vital. With this political will, it will be possible to find the necessary finance to develop the necessary bike infrastructure. Again, Kibera residents could provide a source of labour in the construction of the bike path.

The proposed solution is to build a bike and footpath along the river and the bypass road to connect Kibera residents to the city and its job opportunities, as well as areas for leisure cycling. Nairobi would become a model city in terms of its approach to pro-poor transport and green transport, for the benefit of all the city’s residents, not only those of Kibera.

Finance and implementation: political will on behalf of the city’s government to take this innovative and bold step to become a bike-friendly city will be vital. With this political will, it will be possible to find the necessary finance to develop the necessary bike infrastructure. Again, Kibera residents could provide a source of labour in the construction of the bike path.

Existing transportation network

Proposed transportation network
Challenges to infrastructure improvement in Kibera

The suggestions outlined above may be regarded as over-ambitious, and there are a number of sticking points which can delay but not necessarily prevent implementation of the above suggestions.

- Finances
- The scarcity of land
- The area has been earmarked for redevelopment
- The high cost of formal electricity connections
- Corruption
- Gridlock between tenants, structure owners and the Government of Kenya
- Difficulty to formalize the land titles due to land tenure issues
- The unintended consequences of top-down approaches to planning
- Lack of community involvement/ initiatives.

The list above is daunting, but not insurmountable. The key to implementation is that the residents of Kibera be well organized into small groups, ideally savings groups, thus empowering themselves financially and giving them a measure of independence from the schedules of top down investment. Through organized community residents, it is then possible to hold talks at the community level to find solutions to the issues listed below, and then present the proposed solutions in negotiations with city authorities and possible other interested parties. Investment will be much more forthcoming when it is clear that those on the ground are not just passive recipients but are actively involved in bringing about improvements in their own lives, and able to act as key partners in bringing further changes for their benefit as well as for the city as a whole.

Conclusion

It is hoped that this report has demonstrated that it is possible to apply innovative approaches to finance with a focus on the impoverished, to allow small scale upgrading in the short run, and large scale and environmentally friendly infrastructure in the long run. Partnership between key actors (the local community, the local government, private investors and local and international agencies) will help endender innovative solutions that improve the lives of the slum residents while empowering them financially and giving them vital life skills and employment, as well as improving the overall environment of the city of Nairobi.
Enhancing environmental sustainability in Kibera

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Enhancing environmental sustainability in Kibera

Introduction
The challenge of enhancing environmental sustainability within the informal settlement of Kibera, the largest slum in Nairobi and the second largest slum on the African continent, requires a multifaceted problem-solving approach. The informal nature of the development with its lack of basic infrastructure as well as the high population density, has led to the current underlying environmental conditions. The slum can be defined as an environmentally deteriorated area. Unfortunately for the residents of Kibera, all circumstances have been historically allied against them, causing environmental deterioration of the site and its surroundings. This paper presents an integrated approach for the environmental development and upgrading of the informal settlement in a sustainable manner. The paper identifies the current problems and barriers to environmental enhancement and focuses on initiatives for a stepped environmental upgrading plan to establish immediate long-lasting benefits.

Spatial SWOT analysis

As a starting point the current state of the Kibera environment is analysed in a systematic way. A spatial SWOT (strengths, weaknesses, opportunities and threats) analysis was carried out (see figure below). The current strengths for the Kibera site were identified as the strong sense of community and the residents awareness of the current environmental problems, and their general open attitudes to initiatives. Furthermore the presence of several current non-governmental organisation and UN-Habitat projects as well as the strong awareness of and relations to the current urban administrative and governance hierarchy can be seen as strengths. The current weaknesses of the Kibera site are evident in the lack of drainage and sewage infrastructure and insufficient waste management. Furthermore, there is a vivid lack of open and green spaces for the residents. These weaknesses have obvious social and health impacts, but also negative and direct impacts of soil contamination and soil erosion, and down-slope lake eutrophication of the Nairobi dam area.

In order to improve these conditions, a number of opportunities were identified. One of them concerns the underlying topography of the settlement on a gently inclined slope. The slope has allowed waste and contamination to be transported down-slope away from the settlements and deposited in the Nairobi dam area. However the existence of the Nairobi dam as an undeveloped, green open area adjacent to the densely build slum together with the large number of residents open for involvement and open for participation in upgrading activities can be seen as opportunities. The threats to environmental sustainability within the Kibera settlement are issues related to governance decisions, uncontrolled future demographic growth and the uncertainty related to the future impacts of climate change.

Mitigating current up-slope conditions

The SWOT analysis documents represent the inherent characteristics of Kibera. Key to the current environmental conditions in Kibera is however, the conditions up-slope. These are characterised by:
- waste dumping
- open sewage
- flying toilets
- lack of water supply and unregulated
- lack of runoff and erosion control.

Here water and more specifically runoff is the dominate transport medium for pollution, waste and sewage through down-slope informal settlements and finally to the Nairobi dam area. This has lead to severe sillation, pollution and contamination in the once navigable Nairobi dam. As a result, the priority for a first step to enhance the environmental sustainability of Kibera has to be the control and management of up-slope water and water services. These are crucial to short-term and long-term interventions. Our approach to enhance the environmental sustainability of Kibera focuses on a triple bottom line. First of all the main components of the system are identified; the up-slope informal settlements and the down-slope Nairobi dam area. By closing the current cycle of wastes and nutrients between the two components, agricultural products and economical activities will be provided and the environmental sustainability will be reached. A plan which proposes to gradually upgrade Kibera will provide environmental enhancement and landscape recovery of the Nairobi dam area. It can be expected that social enhancement and economic prosperity will surely follow.

Nairobi dam redevelopment “Kibera Hills” and down-slope interventions

The second phase of the redevelopment will focus on the down slope section and the Nairobi dam area itself. In the figure above, the up-slope interventions previously outlined can be seen. In this phase the dredging of the dam will take place, deepening the water body, making it once again navigable for small pleasure boats and fishing activities. The dredged sediments will be used to construct a series of terraced hills in the middle of the dam. The hill developments will provide space for the residents of Kibera and they are envisaged to become local landmarks. The hills will become landmarks for the wider community reflecting the community togetherness, strengthen the already strong sense of community and reflect the willingness for an improved future. The redeveloped Nairobi dam area will consist of mixed uses by the community with sustainability as the over-arching principle. Parts of the area will be reserved for community space. Segments of the hills and surrounding land will be used for farming, with vertical sack farming occurring on many hill terraces.

In a further step it is hoped that within the Nairobi dam area, sustainable agricultural and environmental training will be offered to the community.

This step leads towards an improved environmental awareness and improvement in public health, as well as maximisation of social and participation in planning and implementation.
Plan for the redeveloped Nairobi dam “Kibera Hills”

At the centre, the dredged water body will act as an economic magnate and as such a shoreline promenade will be constructed. This will turn existing backyards into shop fronts. Along the promenade restaurants will open that serve the food produced on the hills and in the water. Also, restaurant and service training will be offered for disadvantaged youth from the settlement. These activities should be promoted as widely as possible and be included in future editions of well-known tourist guidebooks for Kenya. The main water body will also act in part as the final heliophyte purification basin, with the upstream heliophyte basins acting as inlets.

Artist impression of the Nairobi dam redevelopment “Kibera Hills” (looking west). The connections and integration into the wider community through walkways, bridges (to adjacent Lang’ata area to the south) and green corridors can be seen. Also the promenade and community-owned restaurants can be seen. The hills and the heliophyte basin provide essential services to the community.

In general the recovered green and blue large open space will be multifunctional. It will connect to the existing protected Ngong Forest to the west of Kibera and the Nairobi River riparian zone to the east to form a much wider green (eco) corridor. In this way, not only the residents of Kibera, but also the wider community of Nairobi will benefit. Furthermore connections with neighbouring areas will be strengthened by providing green walkways in the dam and bridges to the Lang’ata area and adjacent sailing club. As a result Kibera gets fully integrated with the surrounding community.

Conclusion

The approach presented here for the sustainable development of Kibera allows also for the environmental enhancement of the existing settlement and its wider integration with Nairobi dam and surrounding settlements. As such the approach highlights the implicit hierarchy and utilizes the interactions of the natural system, social system and economic system to their full current potential. Without a fully functioning natural environment, the achievement of social and economic sustainability will always be hindered. Therefore, environmental sustainability should be viewed as a cornerstone to upgrade the Kibera informal settlement for overall sustainable development.

Within our plan, the landscape recovery and enhancement will have wider social and economical benefits including environmental protection, social advancement and economic prosperity. Furthermore our vision would implement and integrate outcomes through the integration of the natural, social and economic components of the Kibera system. These included the much needed infrastructure to control or reduce the environmental pressures and loads. Think about runoff control mechanisms, water and sewage management, the generation of large open green and blue spaces, employment, community space, environmental education, tourism, agricultural production and economical diversification and further community initiatives.

Hence sustainability would be advanced on several fronts to achieve green, just and economical benefits for Kibera. This paper has demonstrated that a careful planning and redevelopment of the up-slope interventions and the Nairobi dam area will create synergies and provide mutually reinforcing solutions. Moreover this will promote sustainable advancement on every front and as such bringing sustainability to Kibera should be seen as an achievable solution.
Creating economic opportunity from connectivity

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Creating economic opportunity from connectivity

A vision for Kibera

It is proposed that to increase economic productivity in Kibera there is a need to connect Kibera with the rest of Nairobi. Presently Kibera remains a ghetto with both physical and social barriers that prevent the community integrating fully with the rest of the city. Through improved connectivity we propose that Kibera can become more commercially viable and consequentially, more economically productive. Through the creation of streets, local trading is promoted. Through traffic brings business with it and greater prosperity, negative perceptions about Kibera slowly begin to become broken down and integration raises the aspirations of residents of Kibera. The provision of street lighting allows longer trading hours and reduced night time crime, both positive contributors to the local economy.

Skills and opportunities

Kibera has many skills and assets. The community consists of skilled construction workers and tradesmen. Entrepreneurs exist on almost every street corner. Capacity building within the community can be improved further through education and training, which must be freely available for all. While a large number of residents may not be skilled the residents of Kibera are willing to work and want to work, they just need to be provided with the tools to achieve these aspirations. Micro finance and cooperatives have a role to play in assisting both skills and economic development in Kibera.

Overall, increased connectivity within and beyond Soweto East and Kibera to the surrounding neighbourhoods and greater Nairobi brings both greater prosperity and improved integration of all communities within the city.

The framework

During the construction process water and sewage mains and other services such as electricity can be installed to bring sanitation and a clean water supply to Kibera. The creation of streets also allows for easier waste collection and emergency vehicle access, when necessary. Pedestrian and cycle priority streets promote sustainable modes of transport and give residents greater mobility allowing those that work outside Kibera to reach their destinations more easily and efficiently whereas improved access to the local markets offers new trading opportunities for those that buy and sell goods within and beyond Kibera.

Street Market: Existing situation, concept proposal and concept development
Conclusion

The expansion of the streets requires the creation of space. Initially, properties will have to be displaced to make way for the new streets. The use of local labour and materials is essential.

Plots left vacant after relocation and before construction should be utilised for community uses, such as urban agriculture.

Prior to the construction of the road, services should be laid. This should include essential services such as water supply, sewage and electricity.

Once services have been laid, the construction of the road can then be completed, with full drainage.

Street lighting along all routes is essential to allow for longer trading hours which will in turn reduce crime.

Along the main streets more ‘formal’ structures are proposed at intervals of approx. 100m. These ‘adaptable’ structures will be utilised for community uses, such as sanitation, education, etc.
Low rise pilot cluster for Kibera slum upgrade

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Low rise pilot cluster for Kibera slum upgrade

Background

This report describes key issues and possible interventions in Kibera Slum Area resulting from Young Planning Professionals (YPP) Workshop held in Nairobi University, Kenya during the 15th – 18th of September 2010. The workshop had a theme of “integrating urban communities for sustainable cities” with a case study of Kibera Slum Area in the outskirts of Nairobi City.

The work was carried out by YPP Group 1 under the thematic area of ‘Shelter’ with the objective; “To tap the opportunities for shelter improvement by influencing a range of factors including economic, spatial, ecological, technological, and socio-cultural aspects”. The group carried out a critical study of various elements of Shelter in the study area to come up with more workable solutions of shelter improvement.

Data and sources

The primary data collection consisted of reconnaissance surveys, unstructured interviews in the study area and digital photography of the important dimensions of shelter. Secondary data regarding design and redevelopment of Kibera Soweto East (Zone A) was obtained from Ministries of Housing and Land of Kenya and used for assessment of proposed standards and design features. Data gaps still existed about the study areas which were filled with available map data and internet information.

Other notable data used in the study included satellite images of the area, master plan of SE Zone A, detailed design details of proposed housing and various facts about of shelter conditions (both quantitative and qualitative) and related case studies throughout the developing world provided over internet by NGOs like UNHABITAT, UNDP and Asian Council of Human Rights, etc.

General methodology

For the purpose of shelter improvement, the work was divided into two distinct phases. First phase titled “Shelter appraisal” and the second one titled “Assessment and proposal of improved shelter opportunities for the study area.”

In the first phase of appraisal, the group analyzed the existing condition of the study area, made a couple of interactive site visits and unstructured field discussions with the resident community and their elected representatives. Existing shelter conditions were then analyzed in the studio which provided a base for the assessment of possible improvements in second phase. For this phase, salient features of proposed housing improvement in SE Zone A were analyzed with respect to different “Elements of Shelter” and some other workable shelter alternatives were suggested based on data analysis.

Guiding principles

Guiding principles followed in the study included looking at what was financially feasible, technically sound, environmentally sustainable and socially acceptable in terms of unit size and the sharing of facilities like cooking, playing, cleanliness and lavatory.

Appraisal of existing conditions

Kibera is the largest informal settlement of 13 villages in the city of Nairobi covering nearly 225 hectare land. It is a place of residence for nearly 500,000 multi-ethnic people where population density is reaching over 2000 per hectare. This informal settlement is occupying government owned land with no services and poor conditions of shelter. Although there is no land tenure, 95% of residents are tenants of a structure owner who resides either within or outside Kibera.

For slum upgrading, Kibera has been divided into six different zones (Zone A to Zone E) under the KENSUP Program. Slum upgrading of Zone A is underway in the first phase. For this purpose, the housing is being removed and multi-storied apartments will take their place per the proposal of the master plan. Residents of these shacks have been temporarily shifted in apartments at a decanting site in Kibera. A working definition of shelter was established to assist in the analysis. This definition includes characteristics of shelter such as a place of security, privacy, freedom, exclusivity, protection from the environment, and access to services. The group performed two kinds of analyses for site appraisal and the findings of each analysis are given below.

External environment

The site is located in a low lying area located 10 minutes drive from the main Langata Road. The area is accessible within 30 minutes of drive from the CBD and high accessibility makes it even more vulnerable to expansion. The Kibera settlement has spread in available space bounded between the railway line and major roads in the area. It is surrounded by developed land on one side, Nairobi.

Internal environment

Kibera is residence for low waged laborers working in and around Nairobi. Shelter structures are made of metal sheets (mainly of low quality), wood and local indigenous mud. Within the structures, a suitable cut in the metal sheet provides air and light in the building. A structure is normally comprised of 6 living units of normally 3x3 meter square.

Provision of improved shelter: pilot cluster upgrading

After analysis of the proposed high rise upgrading project for Section A, it was decided that provision of low rise buildings has several benefits.

High vs. low rise upgrading

<table>
<thead>
<tr>
<th>Pros Low</th>
<th>Sense of Community</th>
<th>Adaptability</th>
<th>Aesthetics</th>
<th>Community Involvement</th>
<th>Immediate Solution</th>
<th>Access to Services</th>
<th>Rainwater Collection</th>
<th>Potential to harness solar energy</th>
<th>Cheaper construction</th>
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<th>Security/ Community Policing</th>
<th>Adaptability to family size</th>
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<td>Low vs.</td>
<td>High Density</td>
<td>Communal Spaces</td>
<td>Long Term Services</td>
<td>Easier to police</td>
<td>Aesthetics</td>
<td>Sense of Community</td>
<td>High Density</td>
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Proposed cluster layout

The cluster layout uses the current density levels found in Kibera Soweto East as 0.9 ha for 100 units of 3x3m each. This space parameter was utilized in the improved cluster design proposed in this project. The new cluster layout was designed considering the improvement of circulation and communal open space, ability to accommodate infrastructure upgrades, and the maintenance of existing scale and building types.
The building design considers the use of earthen block materials for affordable and sustainable construction. These blocks also enable rapid and easy construction, for example, a 50 meter building can be constructed in 2-3 days. This construction method is also a potential opportunity for economic development if local residents can be involved in the manufacturing process.

Amenity improvements to the cluster include: communal kitchen facilities (garbage burning), communal laundry facilities, shared bath and toilet facilities, solar lighting for external and internal electricity, and improved open spaces.

These amenities were designed considering the most pressing basic needs for the people of Kibera, and by looking at models already in place and successful in the community or larger city area of Nairobi.

The kitchen facilities are modelled after the “Community Kitchen” of Kibera, designed by a Kibera resident to burn paper waste as fuel for the cooking stoves and ovens. This kitchen also provides economic development opportunities to residents by allowing a space to bake breads and other foods to sell within the village.

The bathroom facility is modelled after the UN Bathroom compounds already being provided in Kibera, and is only slightly modified by the addition of a rainwater collection and gray-water recycling functions.

**Conclusion**

In conclusion, sustainable shelter opportunities can be realized in Kibera through affordable and incremental structure upgrades, providing communal facilities and ensuring land tenure for tenants.
The 2010 YPP workshop was jointly organized by UN-Habitat, Government of Kenya, City council of Nairobi, Architectural Association of Kenya, University of Nairobi and ISOCARP.

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