Research Paper

From regulation to empowerment:
Inclusive renovation of existing buildings in Guangzhou City, China

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Abstract

Following the process of high-speed construction in recent decades, China's cities have collaged buildings from various eras, forms, and qualities. A sizable number of old constructions in the city have been plagued by issues of poor functionality and safety, and not properly maintained. Meanwhile, cultural heritage conservation issues related to historic structures lead to a source of social concerns in many cities. How to renovate and maximise the usage of existing buildings has increased challenging issues for many Chinese cities' urban governance. Drawing lessons from the experiences of different types of building renovation projects in Guangzhou City, this study examines the succession of obstacles encountered in the city's present rehabilitation efforts, as well as the relationship between these difficulties and urban management. We argue that the current urban planning system is the primary reason for restricting the inclusive renovation of existing structures. The urban planning system that promotes the growth of new cities is designed to regulate urban development based on modernist technical norms, ignoring the historical values of the city's existing characteristics. Excessive government constraints have resulted not just in unauthorised renovations of old buildings, but also in conflicts of rights. We hereby advocate for inclusive rehabilitation of the existing built environment and recommend regulatory agencies be replaced with adaptive public policies in order to improve the urban planning process by granting owners and communities increased rights to participate in the renovation of existing buildings.

Keywords

Existing buildings, Renovation, Inclusive, Empowerment, Guangzhou

1 Introduction

This article explores urban planning techniques for inclusive and sustainable renovation of existing buildings, with particular attention to historic urban districts. China's cities have undergone an ultra-large-scale urbanization and modernization during the Reform and Opening-up. The urbanization rate has increased from 17.90% in 1978 to 63.89% in 2020, Chinese cities have expanded rapidly over the last four decades, creating vast new metropolitan regions. Simultaneously, many of the historic city's older structures have been demolished or are experiencing functional and maintenance challenges. In addition, issues related to heritage conservation continue to arouse social attention. This article revolves around such a perspective and to elaborate: If Chinese cities are to achieve sustainable development goals, it is necessary to reuse and renovate existing buildings with respecting and sustaining local history and culture. However, the current urban planning system imposes restrictions on the inclusive renovation of old buildings. Therefore, urban planning policies should be revised. The findings reported here are based on Guangzhou's practices and are intended for stakeholders and local government, but the same principles are applicable in other cities of China.

Developed countries have extensive experience renovating existing buildings. Due to the condition of existing buildings and public opinion about them, developed countries accord a high level of respect to adaptive renovations of old houses and cultural heritage buildings (Sodagar 2013). Despite a sound foundation, the renovation of existing buildings still faces challenges. That is, to improve the function of a building without compromising its historical significance, and to ensure investment feasibility (Ding 2013). As a result, developed countries have formulated a series of incentive policies to encourage the renovation of existing buildings with the goals of conserving energy and preserving cultural heritage (Sigmund 2016). However, the renovation of existing buildings is progressing slowly. Taking energy-saving renovation plans as an example, the annual growth rate in Europe is only 0.4-1.2% (Pombo 2019).

China, like other developing countries, has a low level of construction of existing buildings built in the early days. On one hand, in most cases, these old buildings frequently lack the necessary amenities for for modern living. Therefore, extensive demolition and reconstruction are a relatively common solution. On the other hand, the loss of urban culture and excessive consumption of resources caused by the extensive demolition and reconstruction have garnered increased attention. Chinese city governments are attempting to alter their governance methods, shifting away from incremental development and towards to environmental improvement (Zhao 2014). This means the adaptive reuse of existing structures. In some cases, it is even necessary to repurpose the building to meet the needs of development (Yung 2012). China proposed urban regeneration actions in the "14th Five-Year Plan" and emphasised the importance of avoiding large-scale demolition and reconstruction in the renewal mode, along with the importance of heritage conservation and sustainable development. The inclusive renovation of low-quality existing buildings will become a priority for Chinese cities in the future, as these structures should adapt to the needs of their users in order to maintain social utility.

2. The practice of renovation of existing buildings in Guangzhou

Guangzhou is a city with a history of more than two thousand years. The development opportunities created by Reform and Opening-up have had an unprecedented impact on the urban structure of Guangzhou. For more than 40 years, Guangzhou has been splicing urban spaces of different eras, forms, and qualities as a pilot city for urban regeneration. (Feng 2016). In recent years, Guangzhou's urban regeneration has placed a greater emphaiss on the improvement of the built environment and the renovation of old structures. The article discusses numerous experimental cases in Guangzhou, including the renovation of Enning Road and several historical buildings, as well as the installation of elevators in existing muti-storey dwellings. These beneficial explorations uncover a series of challenges associated with the regeneration of existing buildings, as well as their solutions.

2.1. "Micro-renovation" of Enning Road Historic District

Enning Road Historic District is a famous pilot project of urban regeneration in Guangzhou. In 2006, the Enning Road block was regarded as a dilapidated housing area, and the entire neighnourhood was planned to be demolished and reconstructed, causing widespread social controversy (Lui 2015). Therefore, Enning Road, which was partially demolished in 2011, opted for conservation and restoration rather than extensive demolition and reconstruction. In 2018, Enning Road introduced enterprises to repair and maintain dilapidated blocks, as the so-called "micro-renovation" project. The project is being implemented through a Public-Private Partnership; the enterprise is responsible for all the renovation costs, and the government has granted the enterprise 15 years of property management rights. In contrast to previous land use planning for the purpose of extensive development, the government formulated a special plan for the project and gave detailed guidelines for the renovation of each building. In accordance with government guidelines, enterprises have incorporated creative cultural aspects,

educational opportunites and other urban service functions to the Enning Road block, repaired damaged neighborhood buildings, and re-reinforced the building structure.

The Enning Road project is being operated by entrusting enterprises, which enables the government to revitalize state-owned assets and repair the dilapidated built environment more affordably. However, the project inevitably resulted in the neighborhood's gentrification. The project's implementation is predicated on the fact that early migration of some residents and the government's acquisition of properties have enabled enterprises to participate in the renovation and operation. Nevertheless, the commercial operation of the project has created numerous conflicts with the daily lives of local residents.

Figure 1. Comparison before and after "Micro-renovation" of Enning Road Historic District. Source: Photographed by Enning Road Project Team

2.2. Historical building renovation of Chengzhitang warehouse

Chengzhitang is a warehouse with a history of nearly a hundred years. In 2013, due to the long-term negligence of the warehouse, the building owner applied for adjustments on the outside of Chengzhitang which was approved by the urban planning department. However, due to the dispute of its historical value, the construction of Chengzhitang was suspended in 2014 and it was announced as the first batch of historical buildings in Guangzhou. In 2016, the building owner planned to repurpose the function of historic building from a warehouse to a kindergarten, which was approved by the urban planning department. By using the large space of the original warehouse with a height of 6.2m, the renovation project increases the usable area inside the warehouse and incorporates the functions of children's activities, popular science, catering, and education.

Figure 2. Comparison before and after renovation of Chengzhitang warehouse. Source: Photographed by Chengzhitang Project Team

Although after the warehouse was renovated, the administrative licensing procedures had not been completed due to barriers occur in the education department, fire safety department, and construction management department, which made it impossible to operate legally. In 2018, Guangzhou implemented the revitalization of historic buildings and took the renovation of Chengzhitang warehouse as a pilot project. Under the coordination of multiple departments, the administrative procedures from renovation to operation of Chengzhitang warehouses have finally been basically completed in 2020. For Guangzhou,

the project is a breakthrough attempt at the renovation of existing buildings, but the fact that renovation process that lasted for 10 years has also revealed the imperfect administrative procedures for the renovation of existing buildings.

2.3. Installation of elevators in existing residences

Due to past construction standards, there are a vast number of residential buildings that had over 7 floors without built-in elevators in Guangzhou. With the aging of residents, the lack of elevators has gradually become an obvious functional detrimental of this type of residence and hence becomes a life obstacle for the elderly. Since 2016, Guangzhou has accelerated the promotion for the installation of elevators in residential buildings, improved administrative procedures, and provided financial subsidies for the installation.

The installation of elevators will inevitably have an impact on the existing property rights relationship within the community. In practice, residents on different floors object to additional installations for example, based on individual rationality, have notions about negative impacts on lighting, ventilation, privacy, and safety, compensation requirements are not met, or they believe that the cost-sharing ratio is too high. The strong objection of some residents put the negotiation into a predicament. As a result, the Guangzhou government has carried out administrative intervention, clarified the negotiation rules of relevant owners, and put forward guidelines such as suggestions on the proportion of floor sharing costs and the criteria for defining severe obscuration. This will play a positive role in cracking the plight of residents' collective action.

Figure 3. Installation Case in Guangzhou.
Source: Photographed by Elevators Installation Project Team

3. Barriers to the inclusive renovation of existing buildings

Many studies have been carried out on the barriers to the renovation of existing buildings. Bjørneboe et al. (2018) classified the building renovation barriers into three groups, including information, finance, and process. Bertone et al. (2016) summarized the barriers as knowledge barriers, regulatory barriers, financial barriers, and modelling challenges. Alam et al. (2019) identified the key barriers to public building renovation, including the lack of political will, financing protocols, department/agency capability, industry capability, quality assurance, and misaligned incentives. Liu et al. (2020) summarized the barriers as administration, finance, knowledge, and technology. All in all, the barriers can be categorized in different ways, but three categories of barrier are mentioned in most studies: administrative, financial, and knowledge/information.

China's existing building renovation has its own characteristics due to its government structure, taxation system, land system, and economic development. In order to pursue sustainable development, the Chinese government's large-scale promotion of building renovation is an inevitable demand in the future.

During the implementation of several experimental cases in Guangzhou, three main categories of barrier were found: 1) administration, 2) finance, and 3) knowledge/information. In terms of building type, building heterogeneity, construction time, and geographic location, it is impossible to apply the same technology, standard, or code to all buildings. Capital investment and income is another challenge facing most of China's building renovation. In addition, the owner's low recognition of the existing building renovation, and insufficient familiarity with related knowledge and procedures, have also caused difficulties in the development of the existing building renovation.

3.1. Administration

China's urban planning system is formed under the background of incremental construction. In order to meet the supply demand of new construction land, the development and allocation of new land is used to promote urban development (Zou 2015). The core object of urban planning is land usage, and the goal is to regulate land transfer and development. The government sets land usage, construction indicators, and construction requirements through documentations and plans. Urban planning serves as the legal basis for the allocation of development rights and regulates the construction and development activities of right holders. Due to the continuation of the planned economic system, idealized modernist planning serves the goals of new district development or large-scale demolition and reconstruction, often ignoring the historical texture of the city and the boundaries of actual building property rights.

The inclusive renovation of existing buildings needs to deal with the spontaneous and non-specific building use or construction needs of different rights subjects. The "micro-renovation" approach that the government needs to advocate is to take measures such as partial demolition and construction, replacement of building functions, repairs, and improvement of infrastructure. For the renovation of existing buildings, the existing land usage planning has almost no promotion. Urban planning cannot effectively correspond to the complex rights relationship of existing buildings, and cannot provide sufficient detailed coordination and guidance on built environment issues and rights conflicts. Relevant standards and regulations conflict with the actual needs of the built environment. Planning content such as land usage, floor area ratio, building density, green space ratio, road redlines, and spacing concessions, etc., restrict measures to a certain extent. Feasible renovation and utilization of existing buildings are often difficult to implement under the requirements of regulations. This makes building owners choose to circumvent the urban planning management process. Many existing building renovation and utilization behaviors are in a state of uncontrolled guidance and unapproved supervision.

3.2. Finance

In China’s long-term development model, the government obtains incremental benefits from the land through the allocation of incremental development rights, thereby further promoting urban expansion and infrastructure construction (Zhao 2014). The current urban regeneration of Chinese cities continues this institutional inertia, with newly built incremental properties as the main source of income. In the "micro-renovation", the government assumes most of the development rights and responsibilities for the built environment. In the absence of market momentum, the government's unilateral investment has led to inefficient use of funds, and at the same time, it cannot well meet the needs of stakeholders. Currently, China has not established a real estate tax system. The cost of renovation invested by the government cannot be recovered through the increase in real estate taxation, and the government cannot stimulate the independent investment of the owners through taxation tools, which is becoming increasingly unsustainable in terms of finances. Therefore, although the current “micro-renovation” attempts have positive significance, they are still more government-led public welfare projects. Among them, issues such as efficiency, fairness, sustainability, and stakeholder conflicts remain to be discussed.

3.3. Knowledge/Information

The administrative procedures for the renovation of existing buildings are ambiguous, lacking social consensus, and there are contradictions between government's requirements and the owners' needs. For the owner, there is uncertainty about whether the renovation behavior can be officially permitted, and the necessary renovation needs cannot be effectively guided. This has led to an ongoing accumulation of informal urban use and construction, which has exacerbated the deterioration of the built environment and conflicts of interest. Irregular reconstructions and additions are difficult to control effectively, and behaviours such as "residential reform merchants" and homestay operations have existed in an informal state of planning for a long time. Some administrative data has also caused irrational phenomena. The "*Guangzhou City Housing Safety Management Regulations*" allows property owners to reconstruct dangerous houses. This has promoted some owners to take measures to accelerate the deterioration of the structure to meet the standards of dangerous houses, allowing them to rebuild their homes.

The renovation of existing buildings requires the active participation of all stakeholders in the negotiation process, with the demands of building property owners being particularly important. Participation of property owners in decision-making has become a necessary component of encouraging the implementation of the plan, such as the villagers' voting in the regeneration of urban villages, and the consent of the owners of installing elevators in old buildings. The current urban planning formulation process is deficient in terms of public participation. Urban planning results frequently overlook the rights relationships involved in the renovation of existing buildings, preventing the relevant right holders from fully expressing their personal wishes during the process of planning and implementation, and the process of multi-party negotiation systems still has room for improvement.

4. Policy recommendations for the renovation of existing buildings in China

After reviewing the building renovation policies and barriers, the following suggestions are presented to China’s existing renovation policies.

4.1. Grant existing building development rights through planning & Policy

4.1.1. Grant existing building development rights

Planning's primary role in urban governance is to allocate development rights scientifically and rationally. Speaking about land aspect, China adopts a state-owned model of land development rights in practice, where development rights and ownership are separated. The government employs control measures to accomplish the state's land development goals of allocation and intervention.

In the governance of urban built environment, the allocation of spatial development rights in planning should be delegated in accordance with the spatial units of existing buildings. To encourage inclusive renovation of existing buildings, it is necessary to assign development rights to specific buildings and owners. Respecting the property rights of owners is the principle of urban regeneration, which has become the consensus within the Chinese government, but the given development rights is relatively limited (Huang 2019). For example, the development and construction of historical districts are greatly restricted, and it is difficult to obtain legal means for the renovation of existing buildings, which leads to the gradual deterioration of building functions and damages the realization of its cultural value. As a result, urban planning must continue to grant reasonable development rights to existing buildings, including the following aspects:

Figure 4.
The Original Land Use Planning of Enning Road.
Source: Guangzhou Municipal Planning and Natural Resources Bureau

Figure 5.
The "Micro-renovation" Planning of Enning Road.
Source: Guangzhou Municipal Planning and Natural Resources Bureau

- The right to improve the function of the building and adjust the space of the building. A vast amount of existing buildings have below-average safety and functionality due to their ages or their own construction problems. They are in demand of improvement in accordance with current needs and optimized with modern materials, structures, and equipment, such as the installation of external elevators, installing of fire-fighting stairs and corridors, reinforcement, or replacement of unsafe building structures, as well as replacement of old doors and windows. By cause of changes in the requirements or methods of application of property owners, spatial adjustments in existing buildings are also a common request, such as adjustments to internal space separation and adding of the mezzanine. Consequently, perfecting the urban planning procedures and granting development rights through urban planning are the needs of coordinating the conflicts of rights of related parties and protecting the public interest.
- The right to feasibly adapt the purpose of the buildings. Under the influence of market laws, building property owners tend to pursue the most profitable way of using space. The most common manifestation is the demands of “residential reform business” and “industrial reform business”. Purpose Adaptation of land and buildings is also an issue that the planning industry has been discussing. Local governments usually adopt functional compatibility and mixed land usages to try flexible land usage control. In practice, however, management may easily cause new conflicts of rights by changing the existing building function within the compatible function of land usage. Therefore, urban planning needs to formulate feasible rules and negotiation processes to guide adaptation in existing building uses.
- Building expansion rights that are in line with the overall public goals. In order to achieve goals such as increasing public services and improving the built environment, "micro-renovation" often faces the problems of remodelling, expansion, and reconstruction of existing buildings. The placement of “vital catalysts” in public spaces and the construction of small public service facilities require corresponding planning rationale and planning permission procedures. Likewise, the essential is the configuration of existing building development rights, and the boundaries and requirements of their construction activities need to be clarified. The empowerment of urban planning can be regarded as a policy incentive method for the renovation of existing buildings so as to promote the governance of the built environment.

4.1.2 Methods of empowering existing building planning

Taking Guangzhou as an example, there are two instances in which certain development rights are granted to existing buildings through urban regulations:

- Special planning guides the construction behaviour of existing buildings. In the case of Enning Road Historical and Cultural District, the plan classifies each building and structure within the conservation area, and proposes classification measures for repairment, remodelling, relocation, reconstruction, and demolition, as the basis for applying for the renovation of existing buildings. The planning specifically requires the classification of the functional compatibility of buildings, and according to the comprehensive evaluation of conservation needs, building status, surrounding environment and development goals, some residential buildings are allowed to be converted to public services or commercial services. Through the detailed design of the restoration of the historical environment and the improvement of functions, the area and requirements of rebuildable buildings are clarified. In addition, the empowerment content of architectural heritage needs to be formulated more carefully. Guangzhou City has formulated conservation plans for each historical building. Without compromising the historical value of the building, it proposes the scope of changeable use of the historical building and the right to appropriately increase the area of use of the building.
- Formulate specialize policies to grant the right to renovate existing buildings and encourage owners to take action. For example, the "*Regulations on the Conservation of Historical and Cultural Cities in Guangzhou*" provides a series of policy incentives for historical buildings such as repair subsidies, repair services, rent deduction, functional adaptations, and increasing use of areas. The "*Guangzhou Measures for Adding Elevators to Existing Residential Buildings*" stipulates the right to add elevators to multi-storey residential buildings without elevators and grants financial subsidies, as well as to clarify the corresponding procedures and requirements. Renovation of existing buildings requires policy support in which appropriate development rights are given to property owners, so that property owners can become the main body of implementation of the governance of existing buildings, and the procedures for negotiation and negotiation by stakeholders are clarified.

4.1.3 Negotiation of stakeholders

Renovation of existing buildings in high-density, complex property relations in historical urban areas is particularly prone to conflict among stakeholders. The conferment and exercise of existing building development rights are not only a manifestation of the building property owners' unilateral rights, but also closely related to the right of the neighbours and the public interests of the society. The transformation of the building and changes in the state of use will lead to certain negative external effects and will also result in conflicts of interest among stakeholders. The reform projects promoted by government paternalism frequently disregards the rights, demands, and opinions of local residents, leading to conflict and rejection during the implementation process. Government actions under positive goals arise negative evaluations. The formulation of plans and policies requires the involvement of all stakeholders, the development of consensus within that participation, the definition of problems, rights and responsibilities, the formation of cooperation and actions, and the gradual development and implementation of plans (Rui 2019). The empowerment of existing building renovation requires the presence of stakeholders, which is accomplished through a process of mutual recognition and action by multiple subjects.

4.2. Achieve financial balance for existing building renovation

Due to the high initial investment and long payback period associated with the prominent features of existing building renovation, fund investment has become the key to the process (Hrovatin 2018). The implementation of existing building renovation usually encounter problems caused by a lack of funds, an uncertain return on investment, and high maintenance costs. In the case of insufficient market momentum, government financial support is the main source of funding for existing renovation projects. Regarding financial issues, it is necessary to sort out current policies and rationalize various types of

financial support, including development rights and benefits, subsidies, low-interest loans, funds, and incentives.

Residents' financial situation will affect their decision-making on building renovation (Collins 2018). For low-income residents, they lack the ability and willingness to invest in the renovation of existing buildings and heavily rely to a large extent on government financial support. In China, government-funded public projects are an important method for existing buildings to obtain investment in renovation. However, public projects prioritise the public environment and building facades, while neglecting the demands of diverse owners. Additionally, government financial subsidies are the main type of financial support to promote the renovation of existing buildings, but complicated procedures will limit the stimulating effect of subsidies.

Achieving a financial balance of existing building renovation is challenging. On one hand, the government must continue to provide effective financial incentives, such as subsidies, incentives, and tax cuts. On the other hand, it may be a more fundamental issue to transform the diverse values of location and culture into economic value, to increase the profitability of existing buildings, and to achieve sustainable maintenance through the granting of appropriate development rights.

4.3. Popularize the knowledge and information on the renovation of old buildings

Knowledge and information about building renovation are critical in the promotion of building renovation. Baumhof and others stated that residents' confidence in building renovations could be increased by understanding how renovation technology works. More importantly, this knowledge and information contribute to residents' increased willingness to renovate existing buildings. In China, owners have a limited understanding of how to renovate existing buildings and insufficient information, which results in a lower willingness to implement the renovation of old buildings. The popularization of existing building renovation knowledge is a long-term work that the government must carry out.

In addition, it is necessary to cultivate the ability of social co-governance. Open and transparent information about urban planning is necessary, as are substantial and convenient channels for public participation. Effective participation of multiple subjects requires a thorough understanding of planning information, and only with sufficient openness and transparency can planning assist stakeholders in negotiating, the public in comprehending governance goals and processes, and promoting collaborative actions. Under the current conditions of information technology, there are no technical obstacles to the dissemination of urban planning information. Openness and transparency of information, as well as the smooth flow of participation channels, are not dependent on technology, but on the progress of government governance concepts. The ability of social co-governance also requires stakeholders to understand fundamental laws and rules, and be able to dialogue and compromise rationally. Citizens' capabilities can be tempered only through continuous public participation, the creation of an inclusive social environment, the establishment of a common contract and the conscious fulfilment of their responsibilities, and finally, the development of a social consciousness.

5. Conclusions

The renovation of existing buildings is an effective strategy for promoting resilience and sustainable urban development. However, there are a variety of obstacles to encouraging the repair of old buildings, especially in rapidly urbanising countries, including a lack of urban administrative capacity, financial investment, and social awareness. For China, building renovation is a long-term and rigid demand of the urban governance process, which is deeply associated with China's land, planning, and property rights systems. China is still experimenting with a more inclusive and sustainable aproach to building renovation, and further accumulated empirical researches are needed. Therefore, this research aims to investigate

building rehabilitation projects in Guangzhou, identifies obstacles and experiences, and provides relevant suggestions for future promotion of existing building renovation policies.

According to the study, there are administrative, financial, and knowledge/information barriers to the renovation of existing buildings in Guangzhou, with the critical barrier being that the urban planning does not give the existing building development rights feasibly. To realise the goal of inclusive and sustainable reconstruction of existing buildings, the focus of urban planning should be shifted from strict restriction to feasible empowerment, and existing building planning content and procedures must be further improved. Simultaneously, it is vital to find a means to accomplish the financial balance of renovating existing buildings, to assist low-income groups, and to enhance capital's willingness to invest. Finally, through the popularization of knowledge and information, the renovation of existing buildings will become the consensus of stakeholders. In future research, we can continue to investigate the relationship between existing building renovation policies and urban inclusive and sustainable development.

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References

Alam, M., Zou, P.X.W., Stewart, R.A., Bertone, E., Sahin, O., Buntine, C., Marshall, C. (2019). Government championed strategies to overcome the barriers to public building energy efficiency retrofit projects. Sustain. Cities Soc. 44, pp.56–69. doi:10.1016/j.scs.2018.09.022.

Bertone, E., Sahin, O., Stewart, R.A., Zou, P., Alam, M., Blair, E. (2016). State-of-the-art review revealing a roadmap for public building water and energy efficiency retrofit projects. Int. J. Sustain. Built Environ. 5 (2), pp.526–548. doi:10.1016/j.ijsbe.2016.09.004.

Bjørneboe, M.G., Svendsen, S., Heller, A. (2018). Initiatives for the energy renovation of single-family houses in Denmark evaluated on the basis of barriers and motivators. Energy Build. 167, pp.347–358. doi:10.1016/j.enbuild.2017.11.065.

Collins, M., &Curtis, J. (2018) Willingness-to-pay and free-riding in a national energy efficiency retrofit grant scheme. Energy Pol. 118, 211–220. doi:10.1016/j.enpol.2018.03.057.

Ding, G. (2013) Demolish or refurbish – Environmental benefits of housing conservation. Construction Economics and Building, 13(2), pp. 18-34. doi:10.5130/AJCEB.v13i2.3322

Feng, J. & Li, M.R. (2016). Roma interrotta and Guangzhou interrupted: The practical dilemma in urban historic environment and the discipline crisis of architecture. Architectural Journal, 12, pp. 1-8. doi:cnki:sun:jzxb.0.2016-12-002.

Hrovatin, N., Zoric J. (2018). Determinants of energy-efficient home retrofits in Slovenia: the role of information sources. Energy Build. 180, pp.42–50. doi:/10.1016/j.enbuild.2018.09.029.

Huang, J. L. (2019). Property rights incentive: Innovation of spatial governance towards urban spatial resource reallocation. City Planning Review, 12, pp.78-87. doi:CNKI:SUN:CSGH.0.2019-12-013.

Liu, G., Li, X., Tan, Y., Zhang, G. (2020). Building green retrofit in China: Policies, barriers and recommendations. Energy Policy. Vol.139. doi:10.1016/j.enpol.2020.111356.

LIU, Y., TIAN Y., ZHOU K. (2015). From unilateral decision-making to multiple participation in urban regeneration: A case study on Enning road project in Guangzhou. City Planning Review, 08, pp.101-111. doi:CNKI:SUN:CSGH.0.2015-08-018.

Pombo, O., Rivela, B., Neila J. (2019) Life cycle thinking toward sustainable development policy-making: The case of energy retrofits, Journal of Cleaner Production, 206, pp. 267-281. doi:10.1016/j.jclepro.2018.09.173.

Rui, G. (2019). Study of the “translation” mode of actor-based participatory community planning: a case study of Puntoon Wuyue micro-regeneration in Guangzhou. City Planning Review, 12, pp.88-96. doi:CNKI:SUN:CSGH.0.2019-12-014.

Sigmund Z. (2016) Sustainability in architectural heritage: review of policies and practices. Organization, Technology and Management in Construction: an International Journal, 8 (1), pp. 1411-1421. doi:10.1515/otmcj-2016-0007

Sodagar, B. (2013) Sustainability potentials of housing refurbishment. Buildings, 3(1), pp. 278-299; doi:10.3390/buildings3010278

Yung, E. H. K., Chan, E. H. W. (2012). Implementation challenges to the adaptive reuse of heritage buildings: Towards the goals of sustainable, low carbon cities. Habitat International, 36(3), pp. 352-361. doi:10.1016/j.habitatint.2011.11.001.

Zhao, Y.J. (2014). Land Finance in China: History, Logic and Choice. Urban Development Studies. 01,pp.1-13. doi:CNKI:SUN:CSFY.0.2014-01-009.

Zhao, Y.J. (2014). Redevelopment planning: theory and practice. Beijing Planning Review, 04, pp. 153-156. doi:CNKI:SUN:GHJS.0.2014-04-030.

Zou,B.(2015).The transformation from greenfield-based planning to redevelopment planning: Theoretical analysis and practical strategies. Urban Planning Forum. 05, pp.12-19. doi:10.16361/j.upf.201505001.