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UNDERSTANDING THE COGNITION OF THE CHINESE LOCAL GOVERNMENT TOWARDS URBAN RESILIENCE PLANNING

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Abstract

The popularity of "resilience" is continuing to increase in urban research in recent years, following by the application in urban planning. Although it had been articulated that "urban resilience" and "resilience planning" are useful concept and tool for cities to against various uncertainties in the process of development, local government's attitude towards resilience planning is still vague, especially in China. The current Chinese urbanization rate of more than 60% shows that there will still exist a rapid urbanization process in the future in the middle and western area of China, which brings great stresses and challenges to urban development. However, the special "TOP-DOWN" political system of Chinese local government shows that the realization of "urban resilience" highly depends on government's attitude towards resilience planning. Hence, fully understanding the attitude of local governments is the first step to successfully achieve resilience in China.

This study intends to explore the cognition and demands of local governments towards urban resilience planning to indicate the applicability of resilience planning under the context of China. Qualitative and quantitative analyses were applied in this study. Firstly, A framework of "local resilience" was established by authors to show the relationship between local government, urban planning institution and university. Then, qualitative analysis including field survey, in-depth interview and questionnaire was used for data collection. Survey questionnaire for planners, scholars and decision-makers and in-depth interviews for chief decision-makers in governments and famous scholars and directors in institutions and universities were conducted to obtain detailed attitudes, opinions and outlooks. Nvivo, a qualitative data analysis software, was chosen to process large amounts of interview data to show the framework and interrelationship of explicitly. Finally, quantitative statistical method and tools, including SPSS and MATLAB, were used to analyze questionnaire data to show the trend and distribution of attitudes and demands among people from various disciplines.

Hefei, a typical rapidly developing city in China, is selected as case study. The city faces disaster risks because of the seismic fault and big lake in the south. The rapid development also brings city uncertainties in many dimensions. Local government has a strong willing to be "safe city", however, relatively low possibility of disasters makes government whether the resilience planning is necessary as a "high input and low-outcome" project.

The results of questionnaire and interviews reveal that the awareness and cognition of "resilience planning" is relatively low in government and urban planning institutions. "compatible with current planning system" and "operability" are two important requirements of local government.

This study is the first step transforming urban resilience from theoretical concept to operationalizable framework. Important experience in successfully establishing the urban resilience planning framework could be derived from this study for domestic and other developing countries.

Keywords: Cognition, Local government, Urban resilience planning, Hefei City

1. Introduction

The popularity of “resilience” is continuing to increase in urban research in recent years, following by its application in urban planning. The ability of a system to absorb, recover from and successfully adapt to stresses and shocks can be defined as “resilience”[1-3]. Now the resilience is a hot topic in urban study area not only in area of disaster and risk management, but also a new way to understand uncertainty. As the complement or even the substitute of sustainability, resilience is being paid more attention to by researchers, planners and policymakers[4]. Fifty years past after the establishment of resilience theory by Holling, 1973[5]. The process of theory development could be divided into 4 phases: conception, deconstruction, integration and planning practice from author’s perspective. Now the research of resilience mainly concentrate on the urban area, in which scholars try to integrate resilience thinking and methods into urban planning. At present, many resilient urban planning practices have been carried out abroad, such as the "Cities and Climate Change" Research Report (OECD), "A Stronger and More Resilient New York", and London "Management Insurance and Resilience" (2011)[6, 7]. Among them, Japan is at the forefront. After 2011 Great East Japan Earthquake, a resilience planning system had been established to protect human lives, important urban functions, minimize damages and improve the ability to recover quickly. In China, some developed areas had made explorations to improve urban resilience. For example, in the latest master plan, Beijing proposed "strengthening urban disaster prevention and mitigation capabilities to improve urban resilience"; In the "Shanghai Urban Master Plan (2017-2035)", It puts forward the idea that “establishing bottom-line constraints and low-carbon resilience model, giving priority to protecting the ecological environment and ensuring urban safety”. However, in the central and western provinces, including Anhui Province, there are fewer cases of implementing resilient cities. Additionally, a new system of territorial and spatial planning has also been progressing now.

Although it had been articulated that “urban resilience” and “resilience planning” are useful concept and tool for cities to against various uncertainties in the process of development, local government’s attitude towards resilience planning is still vague, especially in China. China is a developing country facing great interior and exterior risks. The current Chinese urbanization rate of more than 60% shows that there will still exist a rapid urbanization process in the future in the middle and western area of China, which brings great stresses and challenges to urban development[8]. However, the special “TOP-DOWN” political system of Chinese local government shows that the realization of “urban resilience” highly depends on government’s attitude towards resilience planning. Hence, fully understanding the attitude of local governments in territorial and spatial planning context is the first step to successfully achieve resilience in China.

Based on above mentioned background, this study intends to address the research question that what is the local government’s real recognition towards resilience? the real understanding and attitude of local government of Hefei city will be revealed to provide foundation for further resilience research and planning practice in China.

2. Local Resilience Framework of Chinese Cities

Local government is the basic level of administration which is closest to the local population and plays a vital role in initiating disaster risk reduction and ensuring urban security within their local areas[9, 10]. Hence, before going through the local government’s recognition in urban resilience, it is important to understand the formation of Chinese local governments and current urban planning system, which will help us to fully explore the policies and ideas of local governments.

2.1 Introduction to local government, Hefei

Hefei City, the capital of Anhui Province, is a member of the Yangtze River Delta City Cluster. Hefei is located in the central region of China and between the Yangtze and Huaihe rivers. The total area of Hefei is 11,400 km^2 and its permanent population is 7.61 million. The urbanization rate of permanent residents in Hefei City was 74.97%, and the per capita GDP was 97,470 RMB at the end of 2018. Hefei city faces risks

of earthquake and flood because of the Tan-Lu seismic fault and Chaohu lake in south area respectively. Additionally, the risk in waterlogging also affects Hefei city.
Hefei city is now at the rapid developing period. Disaster risk will affect the developing process significantly without prevention and mitigation. At present local government of Hefei city organized multiple emergency management department to reduce the disaster risks and improve evacuation activities. However these activities are not integrated in urban planning and the holistic disaster risk reduce system has not been established.

2.2 A new system of Territorial and Spatial Planning

A new system of urban planning, called Territorial and Spatial Planning(TSP) had been proposed and put into practice in 2019. This system brought a great change to urban planning paradigm.
The national document in 2019 clarified the objectives, requirements, system framework and supervision of TSP. Compared with the previous urban planning system, the TSP covers a large space and a large amount of content and is a new planning system to realize the spatial expression of ecological civilization. Realizing ecological civilization is the main task of TSP. From a dialectical perspective on the path to ecological civilization, the key is to reduce the impact of human activities on natural ecosystems. Controlling human development and construction activities in a small scale is the key to accomplishing this task.
As shown in the figure.1, the TSP is divided into five levels, including nation, provinces, cities, counties and towns. At each level, master planning, regulatory planning and specific planning are also included. Different types of planning at different levels focus on different content and jointly form a complete TSP. In this framework, city-level TSP is the most important level of the entire system. Although the design of the TSP system is based on the national policy on the development and protection of territorial space, from the perspective of planning technology, the focus of the entire system falls on the city and county levels. There are three reasons. The first is that top-down protection-oriented policies have paradox with bottom-up interest-oriented development demands. The second is that city-level TSP includes all types of policy expression, space control, and construction planning; Third, city-level TSP needs to face a lot of daily planning permission work. This level of planning must not only deal with internal government relations, but also deal with a large number of government-society relations.

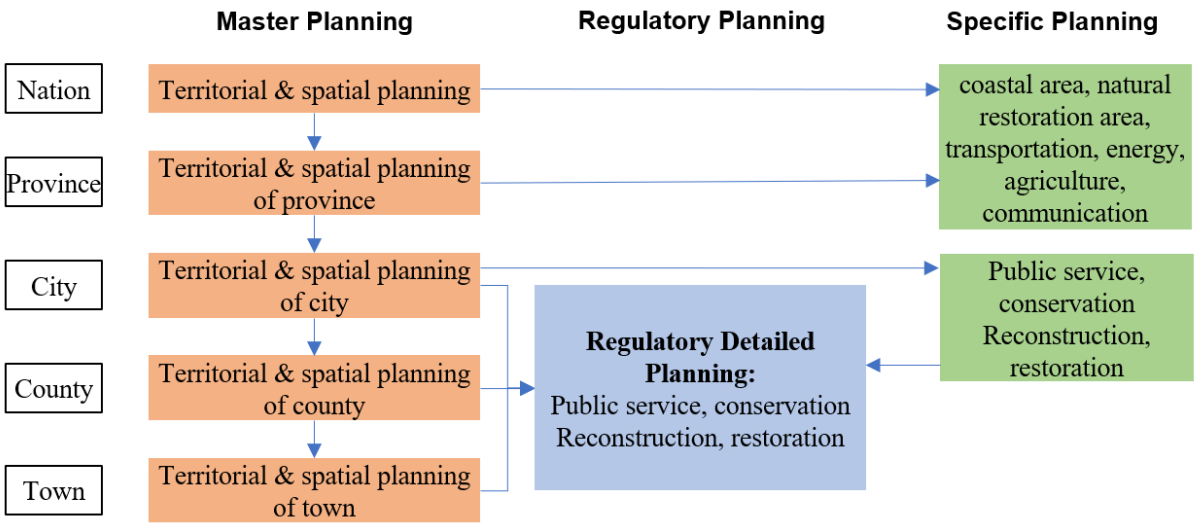

Figure.1 – Territorial and Spatial Planning System

2.3 Resilience within Territory and Spatial Planning

As mentioned above, the TSP is essentially a plan that express ecological civilization into space, which is essentially the same idea of resilience. As the successor of the concept of resilience, its core task is to cope with future uncertainty and achieve ecological civilization and sustainable development. At the same time,

although the framework of TSP had been proposed, it will take a long-term process to put it into practice. In the process, it also provides an opportunity for resilience to be integrated into the framework of TSP.
Now TSP is the main planning work. In order to integrate resilience into TSP, TSP at different levels has different emphasis when implementing the concept of resilience at the aspects of goals, technical routes, and specific strategies. Generally speaking, it is necessary to adhere to problem-oriented and goal-oriented, and change from passive to active. For example, at the national level, the ability of city clusters to jointly respond to disasters should be enhanced from a regional perspective. At the level of master planning and regulatory detailed planning, it is necessary to include the concept and requirements of resilient cities into the future urban development vision and construction indicators, optimize the spatial layout based on the analysis of urban risk factors, and propose engineering and non-engineering measures for disaster mitigation. At the same time, it is necessary to strengthen the connection between planning department and other departments to implement the task of constructing resilient city into government action plan. These put forward higher requirements for the concept of resilience to be integrated into TSP and can be implemented at the local level.

2.4 Mechanism of local resilience

To achieve local resilience, a framework for multi-cooperation is essential. In China, this framework is a TOP-DOWN lead and BOTTOM-UP combined pattern. In this framework(figure 2), firstly, local government, universities and urban planning institutes together form a decision-making framework. Local government is the core department for decision-making and assigns the planning and research tasks of resilience planning to universities and research institutes. At the same time, the institutes and universities work together to provide local governments suggestions for achieving urban resilience. Secondly, other stakeholders, including various management departments and enterprises, will provide data and financial support for such a decision-making framework. Finally, citizens will participate in such a decision-making process, express their needs for resilience construction, and put forward opinions and suggestions.
In this framework, it's evident that the attitude and awareness of local government on resilience play a decisive role because government decisions determine whether resilience planning and related strategies can be done. At the same time, the attitude and recognition of universities and institutes will also influence decision-making. Hence the scope of interview and questionnaire will include local government, universities and urban planning institutes.

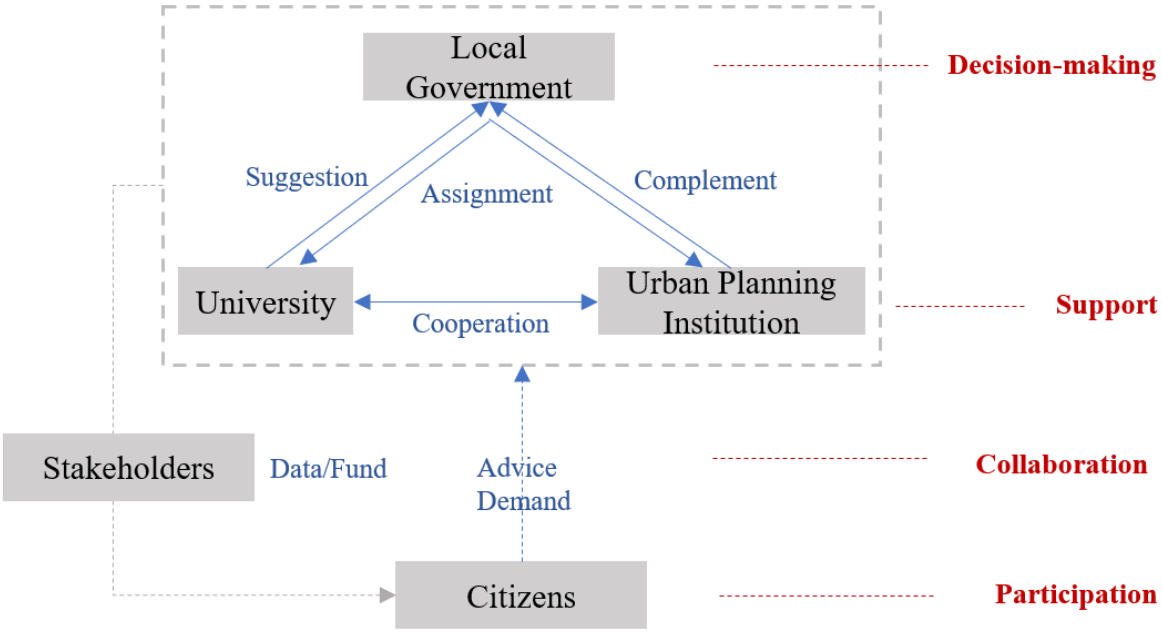

Figure.2 – Territory and Spatial Planning System

3. Methodology

This study intends to explore the cognition and demands of local governments towards urban resilience planning to indicate the applicability of resilience planning under the context of China. Qualitative and quantitative analyses were applied in this study. Qualitative analysis including field survey, in-depth interview and questionnaire was used for data collection. Survey questionnaire for planners, scholars and decision-makers and in-depth interviews for chief decision-makers in governments and famous scholars and directors in institutions and universities were conducted to obtain detailed attitudes, opinions and outlooks. Nvivo, a qualitative data analysis software, was chosen to process large amounts of interview data to show the framework and interrelationship of explicitly. Finally, quantitative statistical method and tools, for example, SPSS, were used to analyze questionnaire data to show the trend and distribution of attitudes and demands among people from various disciplines.

A field survey on this topic was conducted from 2nd, September to 16th, September, 2019 in Hefei City including interview and questionnaire. The framework of this field survey is showed in Table 1. In order to obtain more comprehensive samples, we selected local government, universities and urban planning institute to do this questionnaire through face to face and internet. 26 questionnaires were returned. the basic information of respondents are show in figure3.

The samples with the highest distribution in local government(12) and urban planning institute(10). About 62% of the respondents are major in Engineering with at least bachelor degree. The structured questionnaires were divided into three sections. Section 1 is used to obtain information on individual's sociodemographic characteristics including age, gender, major, degree, agency and service field. Section 2 is used to obtain respondents' awareness, attitude and knowledge of urban resilience. Section 2 were also divided into 3 parts, including the awareness of urban risk, urban resilience and resilience planning. The respondents of the questionnaire are mostly related to urban planning field of Hefei City.

Table 1: Distribution of interviewees during interviews

<table>
<tr><th></th><th>Classification</th><th>Interviewees</th><th>Content</th></tr>
<tr><td rowspan="6">Interviewees should relate to urban planning and urban strategies

Number of questionnaire: 26
Number of interview: 8</td><td rowspan="2">Local government</td><td>3 for interview
(Hefei Urban Planning Bureau director, device director and engineer)</td><td rowspan="6">Questionnaire: awareness of risk, urban resilience and resilience planning

Interview:
(1)the understanding and outlook of urban resilience concept
(2)feasibility and framework of urban resilience planning
(3)suggestions about the practice of urban resilience planning</td></tr>
<tr><td>12 for questionnaire
(include the 3 persons for interview and other staffs)</td></tr>
<tr><td rowspan="2">University</td><td>2 for interview
(professor and lecturer from Anhui University)</td></tr>
<tr><td>4 for questionnaire
(include the 2 persons for interview and other lecturers)</td></tr>
<tr><td rowspan="2">Urban Planning Institute</td><td>3 for interview
(Hefei Urban Planning Institute leader, director and engineer)</td></tr>
<tr><td>10 for questionnaire
(include the 3 persons for interview and other staffs)</td></tr>
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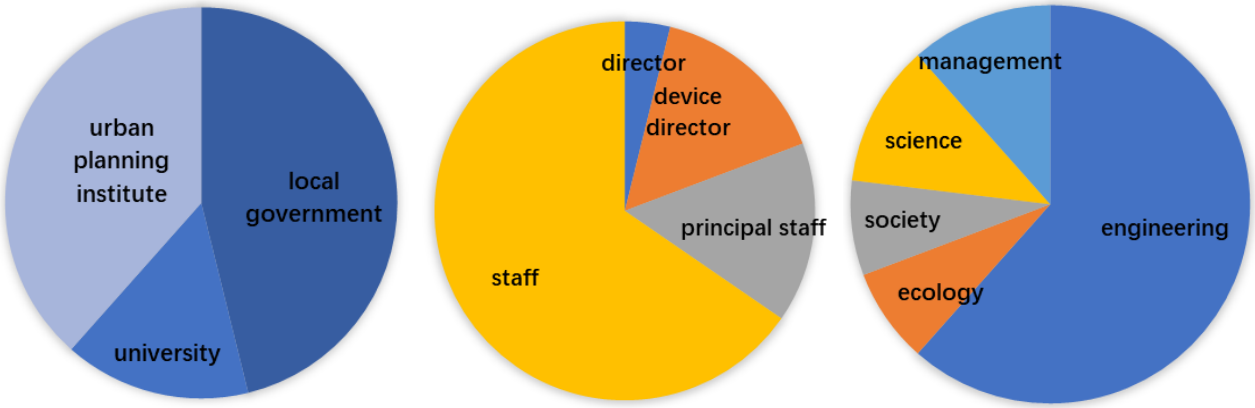


(a)Agency distribution (b)Rank distribution (c)major distribution

Figure.3 – basic information of respondents

Semi-structured interviews were conducted among some high-level officials and leaders to obtain further information. the structure of interview is like questionnaire but more deep, however, interviewers will be more free to explain their ideas and opinions based on their own experience. Finally, 8 officials and leaders were included in this interview.

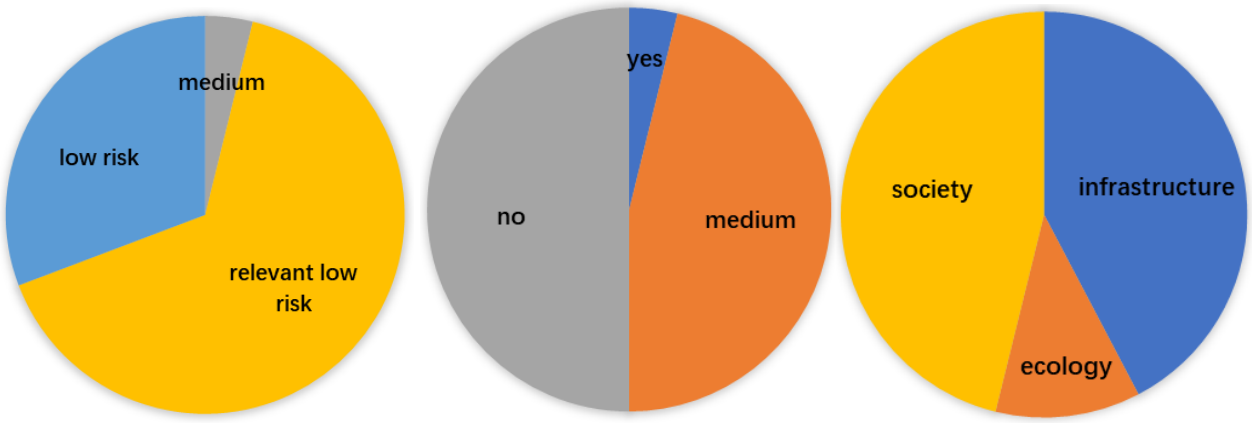
4. Result and Discussion

4.1 Awareness

4.1.1 awareness of risk

It can be seen from the results of the questionnaire that most of the respondents (25) think that the risk in Hefei is relatively low, and some (8) think that the risk is very low, however half of the respondents (13) think that the current planning system lacks the ability to deal with the risks. During the conversation, it is generally believed that the current planning system does not take risk factors into consideration, and focuses more on urban development. In addition, respondents believe that the vulnerability of the current city is mainly reflected in infrastructure (11) and the social dimension (12).

The results show that from various perspectives, government generally believe that the risk of natural disasters facing by Hefei City is low. However although the risk is low, it does not mean that the risk is zero, so it still should be paid attention to. At the same time, because Hefei City is the center of Anhui province, therefore coping with risk is important, although not urgent. The awareness of the lack of planning system's ability to respond to risks also reflects the government's recognition of the importance of risk management capabilities but the lack of feasible measures. Some respondents believe that when we hold the view of “relatively low risk”, it itself proves the lack of resilience thinking. It is worth noting that nearly half of the respondents believe that the current vulnerability is more reflected in the social aspect, which shows that the government departments attach great importance to the social level, and meanwhile, risk perception has also shifted from the physical environment to the social and human perspective.



(a)urban risk (b)dose planning has the ability to deal with risk? (c)vulnerability

Figure.4 – response distribution of risk awareness

4.1.2 awareness of resilience

The results (Figure.5) show that less than half of the respondents (12) said that they had heard of the concept of resilience, mostly from papers, reports and some related projects. When be asked whether they understand the connotation of resilience, most of the respondents said they were not clear, so their attitude towards the concept of resilience was also vague. Some interviewees said that their understanding of the concept of resilience comes from vulnerability, and even directly equates resilience with the concept of vulnerability. Another interviewees mentioned knowing the concept of elasticity, but not much about resilience. When it comes to whether the concept of resilience is applicable to China, most of the interviewees said they could not judge.

From another perspective, a considerable number of interviewees still know resilience, which fully reflects the there is a planning innovation and evolution trend.

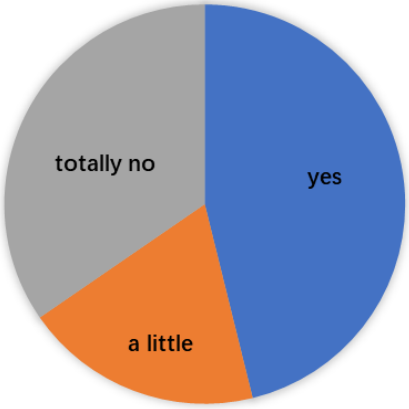
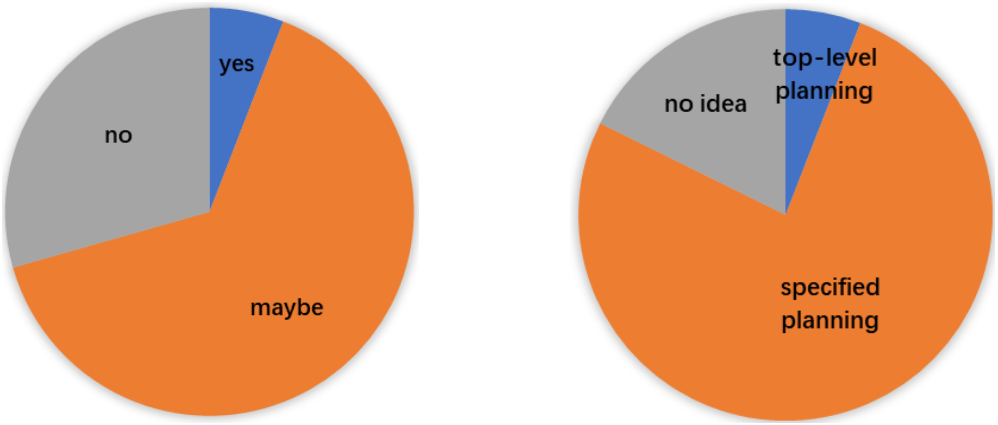


Figure.5 – response distribution of question: have you ever heard the term resilience?

4.1.3 awareness of resilience planning

The answers of awareness of resilience planning is like the result in 4.1.2. It is worth noting that when be asked *should resilience planning be a new type of planning*, most respondents did not give a positive answer, and some of them (5) Give a negative answer directly. When be asked later *how resilience planning should be integrated into the existing planning system*, most (13) respondents believed that resilience planning should be treated as a specific plan or research, rather than as a new planning type.

This result shows that although the government department does not fully understand the concept of resilience and resilience planning, the concept and method of resilience can be applied to the current planning system and can also be used as a specific planning, but it cannot be a new type.



(a)should resilience planning be a new type of planning? (b)what kind should resilience planning be?
Figure.6 – response distribution of resilience planning

4.2 Opinions from experts

From the word cloud derived from interviews by Nvivo(figure.7), there are some interesting keywords. For instance, guidelines, standards, response and so on. some insightful opinions could also been concluded from these interviews.

Awareness and recognition: know but lack of activity

Public understanding of resilience has been improved, from the past passive defense to active response. With nation's economic development, the government's initiative is becoming stronger and stronger. In the past, government documents have rarely mentioned this concept. From the state to the province to the city during the 13th Five-Year Plan, the emphasis on earthquake disaster reduction has been greatly increased. Some national strategies, such as the 19th National Congress report, explicitly put forward the concept of urban security. This is a broad concept, including public safety, food safety, health, etc., and now it has gradually expanded to natural disasters, which is the basis of resilience.

Hefei's economy has also been developed greatly, with adequate financial resources, and has reached a point where it is necessary to respond to disaster risks. For example, the concept of resilience was also mentioned in the specific planning for disaster prevention in the previous municipal facilities planning, but it is obviously not enough to consider only the municipal administration. Public service facilities, green space systems, and old town renewal should also be paid attention to.

How to practice: specific planning

Some experts and officials said that for the country, it definitely should be top-down governance pattern. This is not a question of values, but a question of reality. In the case of different administrative systems, we should have confidence in the government's transformation, improvement of governance capabilities and practical implementation.

The planning system is divided into development planning and spatial planning system. Development planning is the top-level design guide and spatial planning is the implementation of land and infrastructure. The concept of resilience should be reflected in both planning systems. In the coming 14th Five-Year Plan, each level of government should strive to compile a specific planning for urban security, including public safety and natural disasters. It should also be implemented in major specific planning, such as water conservancy and earthquakes. In spatial planning, TSP now downplays the elements of urban and rural planning. If we want to implement resilience, we still have to rely on specific planning. The local government needs to integrate the planning of various departments. At the same time, in order to achieve resilience, spatial management and control should continue to be strengthened.

The assessment of disaster prevention elements should be improved in the planning. What is more important is that the resilience assessment should be given in the specific planning, and then be realized in regulatory planning.

Expected result: Guideline

Some experts said that since resilience is a concept worth applying, a guide is most urgently needed. Guidelines for the formulation of resilience urban planning should be put forward at the national level, and planning guidelines and action guideline should also be put forward at the provincial and municipal levels to guide how to implement and monitor resilient planning or resilient action in the next step. This is also expected result for researchers.

Figure.7 – word cloud of interviews

5. Conclusion

The results of questionnaire and interviews reveal that the awareness and cognition of “resilience” and “resilience planning” is relatively low in government and urban planning institutes. One possible reason is that the relatively low risk perception. “compatible with current planning system” and “operability” are two important requirements of local government. Actually the concept of a resilient city is not a totally new concept. Its estimation and evaluation of urban and regional risks are involved in previous urban and rural planning, however they are fragmented and do not form a complete system. At present, the areas where the concept of resilient cities are applied and implemented are mainly developed coastal areas and disaster-prone areas. For Hefei City, although the concept of resilient city has been valued by governments and has also been mentioned in the visions and goals of multiple plans, the focus is mostly limited to vulnerability, and accurate quantitative analysis of risk factors is relatively lacking. Furthermore, the transformation from idea to strategy is still not systematic. Based on the results, some future directions could be derived:

a new system based on resilience specific planning

Unlike some adaptive planning in Europe or “National Resilience Planning” in Japan, concept of resilience could be applied to TSP but difficult to be a top-level planning in TSP framework. Hence it requires that the demands and requirements of resilience should be achieved by specific planning, including infrastructure, urban security, environment and so on. This may not be the optimal solution for resilience, but the result after compromise and could be adapted to Chinese TSP system.

resilience assessment is the main task

For decision-making, a clear and spatially expressed resilience assessment is the most needed result, which is also the most lacking result at present. This puts forward requirements for the current resilience research. Researchers should seek a more scientific and universal method that combines spatiotemporal analysis, and use it to advise the government.

guideline of resilience planning

The need for resilience planning guidelines is consistent with China's top-down political system, and it can also make full use of resilience's guiding function. At the same time, the content of the guideline should fully reflect the two aspects of development planning and spatial planning. In the preparation of the guideline, the mechanism of multi participation should also be fully utilized to achieve an integration of top-down and bottom-up.

This study is the first step transforming urban resilience from theoretical concept to operationalizable framework. Important experience in successfully establishing the urban resilience planning framework could be derived from this study for domestic and other developing countries.

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