



民强国盛

Smart Cities and Social Governance:

Guide for Participatory Indicator Development



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UNDP China welcomes comments on the research paper via email to Ms. Zhou Shuwen (shuwen.zhou@undp.org).

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Foreword

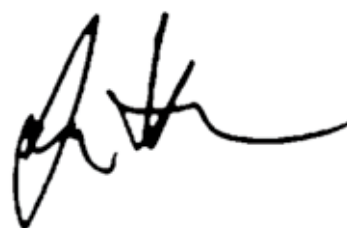
One of the unusual features of China's development in the reform and opening up period has been its ability to achieve levels of human development that are higher than what would be expected given its stage of economic development. Thus, according to UNDP's Human Development Index (HDI), which measures achievements in life expectancy, education and income, even though China is still only an upper middle-income country, it joined the group of countries that have an HDI score between 0.700 and 0.799, considered to be highly developed, in 2011. According to UNDP's *2016 National Human Development Report: Social Innovation for Inclusive Human Development*, while some of this can be attributed to globalisation, it is largely due to continuous reform and opening up, a human-centred approach to development, top-down design combined with local innovation and absorbing and innovatively localising international experiences. However, as the NHDR also notes, while overall human development has increased, it has done so with insufficient fairness and inclusiveness.

The Guiyang Smart Cities and Social Governance Research Collaboration is aimed at precisely addressing the issue of fairness and inclusiveness in city development through a human-centred approach to development, combined top-down and bottom-up project design and the innovative and localised application of international tools. The Guiyang Smart Cities and Social Governance Research Collaboration was initially conceived as a way to harness big data and other smart applications to assess Guiyang's social governance development. Building on earlier work that recognised the importance of public engagement in local government assessment, UNDP partnered with Wing Cloud Big Data Co. Ltd. and the Guiyang Municipal Government to conduct an assessment of social governance in two neighbourhoods in Guiyang. The project engaged local residents in setting community priorities, and created a multistakeholder process to enlist input from experts and government officials in establishing a set of indicators that can track those priorities using available data. Beijing City Quadrant Technology Company (UrbanXYZ) is assisting in gathering the relevant data and progress will be continually updated and shared with neighbourhood committees and local residents creating a continuous feedback loop for civic engagement, government responsiveness and participatory government assessment.

From UNDP's global experience in building the capacity of governments to conduct governance assessments, we have learned that public participation in assessments mobilises public opinion and builds a partnership between the people and the government, unlocking the social and economic development potential of communities. This guide describes the process and tools that were used in the project and presents the final set of indicators that reflect community priorities. Although the end product for this project is an indicator system, the participatory tools and processes can be used in various contexts, including community and urban development planning, city budgeting, and social policy planning. The guide also describes the relevant national-level policies that have created an enabling environment for participatory smart city development.

Meanwhile, local governments need to address increasingly complex challenges and emerging social issues, and implement effective and inclusive city governance with limited resources. Smart city development, driven by big data and cloud computing, has the potential to bring about profound changes in the governance of urban society. At its best, it can produce innovative governance and new techniques and ideas for addressing urban problems. A smart city can contribute to achieving the goal of social and environmental sustainability and creating inclusive and liveable cities, by collecting and sharing information with high-tech support. But 'smart' approaches cannot do this alone. There must also be robust public engagement that ensures that all residents have a voice in the development of their city and in the direction and performance of their government.

UNDP China is proud to be partnering with the Guiyang Municipal Government, Wing Cloud Big Data Co. and UrbanXYZ on this guide. I would like to extend my sincere thanks to all the participants in the project and to the many colleagues in the United Nations System who provided valuable insights and assistance.

A handwritten signature in black ink, appearing to read 'Agi Veres', with a stylized, flowing script.

Agi Veres

Country Director

The United Nations Development Programme China Office

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We sincerely hope that this report will help advance the involvement of the public in policy making, and human-centred smart city development in China.

Part I: Foundations for a participatory approach to the Guiyang social governance and smart city research collaboration

1.1 Introduction

The most recent government work report, delivered by Premier Li Keqiang on March 9, 2017 reaffirms the Chinese government's commitment to improving social development through providing support for employment and business start-ups, improving access to quality education, increasing subsidies for basic health insurance, improving regulatory measures in food and medicine safety, continuing to raise basic pension payments and strengthen safety nets to protect left-behind children, the elderly and people living with disabilities. The work report also commits the government to "...explor [ing] new forms of social governance" which is elaborated as improving self-governance, community governance and the role of social organisations as well as protecting legal rights, especially of vulnerable groups including women, children and the elderly.

Since 2014, UNDP has been working with stakeholders such as Intel, Nesta and the China Center for Urban Development to promote the concept of 'human-centered' smart cities. There has been a great deal of interest over the past decade in applying innovative technological solutions to address urban challenges. However, many smart city projects primarily focus on technology infrastructure or hardware, without a strong understanding of how these projects will address human needs. The concept of human-centred smart cities is to ensure that smart city projects are demand and need-driven and appropriate to each city's context.¹

In October, 2014, UNDP was invited by Intel to join a study tour to Guiyang to look at the practical application of human-centred smart city concepts and to discuss with the Guiyang government the potential to further develop collaboration on smart city development. Guiyang was selected as a pilot for the Ministry of Housing and Urban-Rural Development's smart city programme in 2013. The Guiyang Municipal Government has been pioneering in the development of cloud computing and the use of big data in multiple aspects of smart city development. During the study tour, UNDP introduced the work it had been doing on social governance indicators. The Guiyang Government immediately invited UNDP to collaborate with Wing Cloud Big Data Service Ltd. Co., a private sector company with a mandate to incubate big data-based start-ups on a smart social governance project that would simultaneously increase citizen engagement in city governance and highlight Guiyang's practical experience in smart city development. The 'Guiyang Smart Cities and Social Governance Research Collaboration' was launched at the Big Data Expo on 26th May, 2016.

1. UNDP (2015). *Rethinking Smart Cities: ICT for New-type Urbanization and Public Participation at the City and Community Level in China*. Beijing. Available from http://www.cn.undp.org/content/china/en/home/library/democratic_governance/Rethinking-Smart-Cities_ICT-for-New-type-Urbanization-and-Public-Participation-at-the-City-and-Community-Level-in-China.html

The Guiyang Smart Cities and Social Governance Research Collaboration engages communities and expert stakeholders in developing a set of social governance indicators to assist local government in assessing its progress with and increase transparency for citizens in the provision of social services. Data for the social governance indicators is gathered through and supported on smart platforms.

This guide describes the experience and lessons learned from the Guiyang Smart Cities and Social Governance Research Collaborative, and provides tools for other cities seeking to strengthen citizen engagement in urban decision-making and urban smart city projects.

Part 1 gives an overview of the development and relevant policies in China on smart cities and social governance. It addresses the utility of indicator systems and the value of bottom-up versus top-down approaches to indicator systems as applied to local government and explains the hybrid approach and major components of the Guiyang Smart Cities and Social Governance Indicators. Part II introduces the indicators that were developed through a participatory and multi-stakeholder process in Guiyang and describes data sources and collection methods. Part III describes the participatory methodology used to engage communities and other stakeholders in the selection of indicators. It provides tools for this methodology and presents lessons learned from the project.

1.2 ‘Smart Cities’ and ‘Social Governance’ in the Chinese Context

1.2.1 Smart city policy and development

The concept of smart cities originated during the 2007--2008 global financial crisis. In November 2008, IBM began work on a “smarter cities” concept as part of its Smarter Planet initiative.² By the beginning of 2009, the concept had captivated the imagination of a wide variety of governments, organisations, and individuals across the globe. In September 2009, the City of Dubuque and IBM announced their intention to make Dubuque the first smart city in the United States.³ After that, smart city strategies were issued and developed in various countries, including Switzerland, Finland, Singapore, South Korea.

In 2009, in response to the financial crisis, the Chinese government announced a stimulus plan to inject 4 trillion Yuan into China’s economy. IBM saw the commercial opportunities in China, and held 22 smart city forums communicating with more than 200 mayors and nearly 2000 city officials. The term ‘smart city’ became widely accepted in China, and many cities, such as Nanjing, Shenyang, Chengdu, and Kunshan, began strategic cooperation with IBM.⁴ At that time, IBM had already signed an agreement with the Shanghai World Expo Bureau in 2008 as the main sponsor of the computer systems and consulting services for the Shanghai Expo. With the theme of “Better city, Better life”, the Shanghai Expo incorporated high level information communication infrastructure and information technology into its displays.⁵ The successful application of smart buildings and planning in the Shanghai Expo has helped drive the nationwide construction of smart cities in China.

2. IBM Corporation (2008). *A Smarter Planet: the Next Leadership Agenda*. Turkey. Available from https://www.ibm.com/ibm/cioleadershipexchange/us/en/pdfs/SJP_Smarter_Planet.pdf

3. Harrison, Colin; Donnelly, Ian Abbott (2012). *A Theory of Smart Cities*. Available from <http://www.interindustria.hu/ekonyvtar/en/Smart%20cities%20and%20communities/Publications/A%20theory%20of%20smart%20cities.pdf>

4. Li, Yongling; Lin, Yanliu; Geertman, Stan (2015). *The Development of Smart Cities in China*. Available from http://web.mit.edu/cron/project/CUPUM2015/proceedings/Content/pss/291_li_h.pdf

5. Ibid.

In China, the government defines a smart city as “a new concept and model which utilises the next generation of information technology, such as the Internet of Things (IoT), cloud computing, big data, to promote smart urban planning, construction, management and services for cities”.⁶

In general, there are four types of government policy documents on smart cities. First, there are specific plans or policies for smart cities, including long-term government plans, construction schemes, guidelines, and project management methods. Second, policy on smart cities is included in the overall government plans on the national economy and social information development which include special sections for smart cities policy. Third, there are policies on topics such as “urban information” or “digital city”, which are similar with smart city goals. Fourth, there are pilot projects funded by several central government ministries with a focus on the development of smart cities or related infrastructure.

In September 2014, NDRC and seven other Ministries⁷ jointly issued a strategic policy document, the “Guidance on Promoting Healthy Smart City Development”. This Guidance lays out principles for smart city development in China, including strengthening comprehensive public services using smart technologies, promoting data collection and sharing on digital platforms, supporting law enforcement, including taxation compliance through smart technologies, and establishing e-government and online channels for citizens to express opinions. The Guidance emphasises the need for smart cities to be human-centred and practical, city-based, demand-driven and market-oriented while minimising unnecessary government intervention.

In China’s *New-type Urbanisation Plan* released in 2014 by the State Council, Chapter 18 Section 2 identifies the construction of smart cities as a priority. The critical applications for smart technologies in cities are identified as 1) broadband information networks; 2) informatisation of planning and management, including building public information platforms; 3) intelligent infrastructure in transportation, power, water and sewage, and pipeline networks; 4) convenient public services; 5) industrial development; and 6) social governance.⁸

By the end of 2015, three sets of smart city pilots had been issued, 337 cities in total. All the directly-administered municipalities, 100% of sub-provincial cities, 89% of prefecture-level cities and 47% of county-level cities are engaged in smart city development.⁹

The concept of ‘smart cities’ was first included in the government’s work report in 2015 and in 2016 and the expansion of the smart city pilots was identified as a goal in the 13th Five-year Plan.

Since then, many other policies have been promulgated with specific reference to smart cities in areas such as manufacturing, transportation, medical industries, tourism, geoinformation (mapping) internet, big data, cloud computing, etc. In general, the specific policies can be classified into five types: technology development, social development, sector development, industry applications, and governance.¹⁰ Recently, more emphasis has been put on technological development with the emerging of new technologies such as big data and cloud computing. Nevertheless, the government has emphasised that smart city development should align with the principles of “new-type urbanisation” put forward in the *New-type Urbanisation Plan* and be human-centred, practical and demand-driven.

6. National Development and Reform Commission (2014). *The Guidance on Promoting Healthy Smart City Development*. Beijing. Available from <http://www.sdpc.gov.cn/gzdt/201408/W020140829409970397055.pdf>

7. The seven ministries include: Ministry of Industry and Information Technology (MIIT), Ministry of Science and Technology (MOST), Ministry of Public Security (MPS), Ministry of Finance (MoF), Ministry of Land and Resources (MLR), Ministry of Housing and Urban-Rural Development (MOHURD), and Ministry of Transport (MoT).

8. State Council of the People’s Republic of China (2014). *National New-type Urbanisation Plan (2014-2020)*. Beijing. Available from [http://www.51baogao.cn/uploads/xinxingchengzhenhua\(2014-2020\).pdf](http://www.51baogao.cn/uploads/xinxingchengzhenhua(2014-2020).pdf) [in Chinese].

9. Xiao, L. (2015). *Development Trends for China’s Information Market*. Market Observer: 51-53.

10. Sun, J.; Pei, L.; Zhou, Z.; Qiu, P. (2016) *Multi-interpretation and Qualitative Analysis of Smart City Policy Goals in China*. Library and Information 6: 25-32. [In Chinese]

1.2.2 Social governance

In 1998, The State Council Organisational Reform Plan first put forward the concept “Social Management” (社会管理) when it defined the basic functions of government as “Macro-control, Social Management and Public Services”. In 2011, Chinese President Hu Jintao gave a keynote speech on social management innovation reiterating its centrality to the Chinese Communist Party’s concept of governance, one that signalled an acknowledgement that Chinese society was transitioning from one where the centrality of the Party and government were all-encompassing to one where many new organisations, actors and stakeholders had key roles to play. The Party and government were therefore taking on more of a managerial role. Social management is a term that has no direct English translation but generally refers to the regulation and control by the government of social affairs, social organisations and social life under the rule of law. Issues related to social justice, public security, social stability, and social services have often been brought under the umbrella of social management.¹¹

During the 3rd plenum of the 18th Party Congress, in November 2013, the term social governance (社会治理) was introduced. Introducing the term governance was seen as signalling a greater shift towards participation and collaboration between the government and civil society.¹²

In the 13th Five-Year Plan, social governance is given a prominent role, in particular in “Chapter 70: Enhance the social governance system”. According to the plan, the government seeks to develop the social governance system under the Party’s leadership through social cooperation, public participation, and rule of law, so as to achieve a good interaction between government management, social regulation and residents’ (居民) autonomy. This chapter is divided into six sections, namely: to enhance government management capacity and level, including through the use of science and technology and by improving transparency, to strengthen community service, including improving the delivery of social services and increasing the role of social organisations and volunteers, improving the role of social organisations, including by clearly delineating roles and responsibilities, enhance social self-regulation through improved ethics, legal norms, family responsibilities and social behaviour, to improve the mechanisms of public participation, including protecting people’s right to know, participate, make decisions and oversee the government, and to guarantee the protection of human rights and conflict resolution.

While the meaning of social governance continues to evolve, in this project, we are building on a 2012-2014 UNDP project “Support for the Development of a Social Governance Assessment Framework in China”, written in collaboration with the China Centre for Comparative Politics and Economics under the Central Compilation & Translation Bureau. That project identified the critical dimensions of social governance to include human development, social justice, public services, social security, public security and public participation. It also builds on the UNDP research project “Engaging Public Participation in Government Performance Assessment in China” which reviews the history of public engagement in government performance assessment in China and highlights eight case studies of good examples of effective public engagement in government assessment. This project recognises that while there are still barriers to systematic public engagement in local government performance assessment (e.g.

11. Yu, Keping (2012). *China Social Governance Assessment Index System*. China Governance Review.
12. Leng, Lim Teng (2014). *Research Report: Overview of Social Governance in China*. Available from <https://www.cscollge.gov.sg/Knowledge/Pages/Overview-of-Social-Governance-in-China.aspx>

many local officials question the public's ability to engage in impartial and objective assessment), nevertheless more and more cities and towns recognise that public participation contributes to the improvement of government performance through integrating public needs into the performance management system, provides effective external monitoring, and sets the direction for the improvement of government service provision. Public participation can help the government obtain wider public support, and facilitate the transformation of the government performance management system from an "efficiency-based" to a "responsibility-based" system,¹³ thus strengthening the legal basis of government activities.¹⁴

In addition the project is informed by UNDP's work globally on governance assessment¹⁵ and local governance.¹⁶ UNDP's global experience in building government capacity for public sector assessments has shown that public participation in such assessments contributes to mobilising public opinion and building the dialogue between government and citizens, so that they can work together on a common vision for their society. By better serving the needs of the people, government can improve the opportunities for communities to realise their social and economic development potential. Through the better interaction with government and the stronger delivery of services, communities can invest their efforts in productive local development, supported by government rather than held back by overly bureaucratic procedures. As well, UN Habitat's "Guidelines on Decentralisation and the Strengthening of Local Authorities" set out universal principles for local governance which highlight the need to ensure the wider participation and empowerment of citizens and a variety of stakeholders in local governance as well as improved capacity for data gathering and increased transparency and information-sharing by local authorities.¹⁷

In light of this work, the Guiyang Social Governance and Smart City Research Collaboration made a critical shift from the earlier thematic research on social governance assessment with the Central Compilation & Translation Bureau to centre public participation in the development of an indicator system that can be applied in the smart city building in the urbanisation process of China, with Guiyang as the first pilot. This will be discussed in more detail in the following section, but first, recent policies supporting greater public participation in governance in China are reviewed.

1.2.3 Public participation in governance

Linked to improved social governance is the increased emphasis on the importance of public participation (公众参与) in decision-making since the expansion of deliberative practices starting in the 1980s as part of the rise of a wider range of participation including village elections and public hearings. China has implemented various reforms to increase the level of citizen participation in legislative and executive decision-making, including "public hearings, deliberative polls, citizens' right to sue the state, initiatives to make government information public, increasing use of People's Congresses to discuss policy, and acceptance of some kinds of autonomous civil society organisations".¹⁸ With the release of "Opinions on Strengthening the Power of the Chinese People's Political Consultative Conference (CPPCC)" in 2006, public participation has been specifically included in a range of policy documents including the five-year plans. Legal protection for public participation has been enacted through the "Legislation Law", "Pricing Law", "Enactment of Administrative Regulations" and "Price-making Hearing

13. Dusenbury, Patricia J.; Liner, Blaine; Vinson, Elisa (2000). *States, Citizens, and Local Performance Management*. Urban Institute.

14. Wang, Xixin (2008). *Public Participation, Professional Knowledge and Government Performance Assessment Model - Exploring an Analysis Framework for Government Performance Assessment Model*. Rule of Law and Social Development: 14.

15. UNDP (2011). *Governance Assessment Project Fast Facts*. Available from http://www.undp.org/content/dam/undp/library/Democratic%20Governance/DG%20Fast%20Facts/Fast_Facts_Governance%20Assessments_Draft%203-BDP-SB.pdf

16. UNDP (2016). *Framework for Local Governance and Local Development*. Available from http://www.undp.org/content/undp/en/home/librarypage/democratic-governance/local_governance/integrated-framework-to-support-local-governance-and-local-devel.html

17. UN Habitat (2009). *International Guidelines on Decentralization and Access to Basic Services for all*. Available from <https://unhabitat.org/books/international-guidelines-on-decentralization-and-access-to-basic-services-for-all/>

18. He, B.; Warren, M. (2011). *Authoritarian Deliberation: The Deliberative Turn in Chinese Political Development*. *Perspectives on Politics*, 9(2), p. 269.

Law” and they provide legal protection for public participation. Legislation in the area of environmental protection has been particularly far-reaching and includes: “Interim Measures for Public Participation in Environmental Impact Assessment”, “Environmental Information Disclosure Measures”, and “Guidelines on Promoting Public Participation in Environmental Protection”. The revision of the 1989 Environmental Protection Law (EPL) adopted at the 8th meeting of the Standing Committee of the 12th National People’s Congress on April 24, 2014 is a particularly good example of both public engagement and attitudes towards social governance. The draft law underwent 3.5 years of public consultation, had over 14,000 inputs from stakeholders and was redrafted 4 times before being finalised. The main area of revision was to broaden the criteria for which social organisations had standing to sue polluters under the new law.

In addition, in September 2014, the Ministry of Environmental Protection held a national seminar on public participation in the area of environmental protection. In June 2015, the China People’s Political Consultative Conference and the State Council released the “Opinions on Accelerating the Construction of Ecological Civilization” which included provisions to improve the disclosure of environmental information, to protect people’s rights to access information, and to encourage public participation. On July 2nd, 2015, “Laws on Public Participation in Environmental Protection” was issued by the Ministry of Environmental Protection and took effect in September 2015. This law aims to promote proper public participation, to accelerate the pace of reform, and to promote the transformation of economic and social development.

The central government has also been promoting public participation as an innovative way to address China’s emerging urbanisation challenges. In 2008, the new Urban and Rural Planning Law of the People’s Republic of China was issued, in which public engagement was for the first time stipulated. The *New-type Urbanisation Plan* issued by the State Council in 2014 emphasises the importance of public participation and positive interaction between citizens and the government to improve urban governance.¹⁹ Many local governments have implemented systems to garner more public input into decision-making. For example, Harbin, Heilongjiang and Wuxi, Jiangsu have set aside parts of their budget to be allocated through a participatory budgeting process while Wenling, Zhejiang now has 70% of its budget decided through public consultations. Meanwhile, since 2006, the local People’s Congress and citizens have participated in public service budgeting in Shanghai, although the process still solicits considerable input from policy experts. All these cities use publicity, financial information disclosure, online voting and community public participation to make the community budgeting process more democratic, open and transparent. Information and communication platforms as well are more and more being used to solicit feedback from citizens, increase government accountability and transparency, improve public services and provide lifestyle information and platforms for community-building.²⁰

1.3 Bridging a 'bottom-up' method to the conventional 'top-down' approach (methodology)

1.3.1 Bottom-up vs. top-down

In many countries, regions and cities, a ‘top-down’ paradigm is the mainstream approach

19. State Council of the People’s Republic of China (2014). *National New-type Urbanisation Plan (2014-2020)*. Available from [http://www.51baogao.cn/uploads/xinxingchengzhenhua\(2014-2020\).pdf](http://www.51baogao.cn/uploads/xinxingchengzhenhua(2014-2020).pdf) [in Chinese]. See especially Chapter 19 Strengthen and innovate city governance

20. UNDP (2015). *Rethinking Smart Cities: ICT for New-type Urbanization and Public Participation at the City and Community Level in China*. Available from http://www.cn.undp.org/content/china/en/home/library/democratic_governance/Rethinking-Smart-Cities_ICT-for-New-type-Urbanization-and-Public-Participation-at-the-City-and-Community-Level-in-China.html

in policy-making and resource distribution. Policy-making has long been considered a highly technical job that needs ‘rational and comprehensive’ assessment and design, and was only an arena for ‘experts,’ academics, political leaders and so on. To enter it, the bar for credentials was high. In China, emphasis is in particular put on ‘scientific’ approaches to the development of good policies and sound distribution of resources.²¹

However, a top-down approach to policy, even if ‘rational and comprehensive,’ can often backfire. Experts may be unfamiliar with the local context and the needs of different social groups, and expert policy development often leads to unpredicted side effects and conflicts during policy enforcement; as well, outcome bias often favours vested interests.

In response to the disadvantage of top-down approaches, a bottom-up paradigm has emerged, which values the role of ordinary people and communities who were often disadvantaged by the outcomes of policy making, due to unbalanced power relations. The advocates of bottom-up approaches believe that people should be given space to express opinions, be empowered with analytical tools to propose ideas, and lead policy making. Policy planners’ role should transform into that of facilitators. With deepening degrees of participation, from ‘nonparticipation,’ to ‘tokenism,’ to ‘citizen power,’²² people can play increasingly bigger roles in decision making and shape a more just society.

The global wave of government decentralisation has offered the chance for the expansion of bottom-up approaches. However, bottom-up approaches also have limitations and are often criticised for a focus on current needs, unrealistic expectations from communities, long project cycles and high costs.

Table 1: Bottom-up and top-down approaches to policy development

	Top-down approaches	Bottom-up approaches
Features	<ul style="list-style-type: none"> - Elite-led - Special interests 	<ul style="list-style-type: none"> - Community-led - Public interest
Pros	<ul style="list-style-type: none"> - Clear policy goal - Aims to desired effect^{23 24} 	<ul style="list-style-type: none"> - Community-centred - Higher effectiveness (Smith, 2003) - Lower conflict incidence in implementation - Enhanced public awareness and knowledge (Ferguson & Low, 2005) - Empowerment of the local communities²⁵
Cons	<ul style="list-style-type: none"> - Client-oriented - Policy and planning done from current conditions - Lacks complexity 	<ul style="list-style-type: none"> - Time and budget consuming for decision making - Myopic - Raises expectations from communities that may be unrealistic

The combination of top-down approaches and bottom-up approaches have the potential to overcome the disadvantages of both, and amplify the advantages in the policy making process.

21. In China, scientific government policymaking was first raised at the fourth plenary session of the sixteenth Communist Party of China (CPC) Central Committee meeting in 2004. At the conference, the Central Committee discussed setting up a sound decision-making mechanism that enables the government to be fully aware of the conditions of the people, reflect their will, pool their wisdom and value their resources, so as to put decision-making on a more scientific and democratic basis. At the seventh CPC Central Committee meeting in 2007, the concept of “Scientific Development” was first put into the Party Constitution, thus becoming the basic guidance for legislation and policy in China. Scientific policy development goes hand in hand with scientific development and they serve as administrative practice and theoretical concept for the Chinese government.

22. Arnstein, Sherry R. (1969). A Ladder of Citizen Participation. *Journal of the American Planning Association*, 35: 4, 216 — 224

23. The term ‘Desired effect’ indicates ideal results, that is, the results that are expected by the policy makers.

24. Matland (2005). Synthesizing the Implementation Literature: The Ambiguity-Conflict Model of Policy Implementation. *Journal of Public Administration Research and Theory*, 5, pp. 145-174.

25. Petermann, T.; Troell, J. (2007). African Regional Workshop on Public Participation in International Waters Management.

1.3.2 Evaluating smart cities and social governance

Indicators are important in holding governments and communities accountable to their sustainability targets and goals. Indicators can provide data to guide policy-making and allow for comparisons to be made across municipalities and regions. Indicators are also communication tools and can help increase transparency and mobilise public opinion. They are distinguished from raw data and statistics by having reference values in the form of benchmarks, thresholds, baselines and targets. Such values have multiple functions, but the most important is to transform meaningless data into information. The use of indices can assist policymakers in identifying goals and disaggregate larger targets into smaller parts. They also provide quantitative and unified results to evaluate performances on various objectives for further comparison and ranking.

At the same time, overreliance on indicators as an evaluation system can result in over-generalisation or skewed prioritisation of particular aspects of an issue because of the way in which complex social issues are reduced to what can be measured by a set of indicators. There is also the danger of “gaming the system/chasing the ranking”, where actions that prioritise increasing rankings are pursued with no regard for negative consequences or resources are diverted into areas easily measured by the selected indicators.²⁶ For example, GDP is often criticised as prioritising economic growth over human well-being and alternative indicator sets such as UNDP’s Human Development Index or Bhutan’s Gross National Happiness Index have long been used as a way to expand the concept of human development beyond GDP. In attempting to reflect the complexity of the area of evaluation, some indicator sets expand to cover more and more areas, leading to challenges in data collection, interpretation and communication. While indicators are a valuable tool, they are best used as part of a more comprehensive evaluation process that encourages dialogue and collaboration to improve outcomes.

There are many international and Chinese indicator systems and assessment tools that evaluate local governments from a variety of perspectives: sustainability, economic performance and/or poverty, environment, technology, innovation, and governance in multiple combinations. Local governance assessment should not be seen as a subset of national governance assessment as local governance assessment provides “...important information on issues specific to the local level, such as policies vis-à-vis decentralisation, participation and local accountability.... the local level is in a daily and intensive interaction with the citizens. Therefore, local assessments need to be much more sensitive to the particular needs of groups of stakeholders and certain segments in the local community.”²⁷

Smart city assessment in China

Smart city evaluations have been launched in China by some of the major technology companies such as TenCent, but these evaluations tend to focus on the private sector company’s products. However, in 2016, the National Development and Reform Commission (NDRC) and the Central Network Office released the “Smart Cities Development Report 2015-2016”, the first comprehensive annual report on smart cities. NDRC, the Central Network Office, and the National Standards Committee also jointly issued the “Notice on the Implementation of Smart Cities Evaluation” and issued “Evaluation Indicators on Smart Cities (2016)” in November. NDRC is in the process of developing a standard index system to be applied country-wide as of 2019. In the overall

26. Hozapfel, Sarah (2014). *The Role of Indicators in Development Cooperation* Chapter 8. Available at <http://www.oecd.org/dac/peer-reviews/The-role-of-indicators-in-development-cooperation.pdf>
27. UNDP Oslo Governance Centre (2009). *A User’s Guide to Measuring Local Governance*.

framework of NDRC's indicator system, there are nine first-class indicators including four indicators that aim to evaluate cities' capacity in urban planning, construction and governance with the use of innovative technologies including the application of internet, cloud computing, big data, spatial geoinformation, etc. Second-class indicators in these aspects involve the level of information transparency and sharing, network security, technological innovation, etc. Another five first-class indicators are used to assess cities' convenience, liveability, comfort, security and happiness. Relevant second-class indicators include the intelligence of infrastructure, the convenience of public services, the refinement of social management, the liveability of ecological environment, the modernisation of industrial systems, etc.

Prior to this, the China Academy of Social Sciences released a smart city index in 2012 as did the Ministry of Industry and Information Technology. These indicator systems largely focus on smart city hardware and technology, although the MIIT index is based on three categories defined as smart technologies, smart governance, and smart services. The indicators in the governance category, however, mainly examine local government management capacity, for example, around city construction processes.

Social governance assessment in China

Indexes that specifically focus on social governance are less common in China, although many, such as the Sichuan Academy of Social Science and UNDP's Western China Urban Sustainability Evaluation Indicators²⁸ include social indicators such as employment and housing. Peking University is also releasing a governance index in 2017.

Existing indices are mainly provided by governments or research teams with little engagement with the public. However, the goal of improving social governance cannot be achieved only by top-down efforts without public participation. If the participants in developing an indicator system are mainly research experts and scholars, and few other stakeholders such as city managers, or residents are included, this will diminish the effectiveness and legitimacy of the indicators even if the indicators selected as the result of an expert-driven process and a participatory process are largely the same. The establishment of an indicator system needs the collaboration between government and other stakeholders. Participation from the public in the process of defining indicators determines to a large extent the effectiveness of the indicators. As can be seen from the 13th Five-Year Plan, social governance and public engagement and participation are inextricably linked. An evaluation system for local government performance in social governance must also reflect the value of public participation.

1.3.3 Bottom-up assessment tool development

To maximise the effectiveness and legitimacy of the assessment tool for social governance, this project reverses traditional methods. Researchers become facilitators and technical supporters, going to the field with no hypothesis and theoretical framework.

The whole process follows six steps:

- a) community deliberation to generate raw indicators;
- b) information summarisation and terminology conversion by the project team;

28. SASS, UNDP (forthcoming).
2016 Sichuan Sustainable Cities
Development Report.

- c) multi-stakeholder deliberation to supplement valuable indicators uncovered by the communities, and to bridge the gap between community concerns, administrative restrictions in government, and the existing data capacity;
- d) indicator revision by the project team;
- e) desk research for categorising indicators;
- f) finalisation of indicators

The goal of each deliberation is to reach consensus. Consensus first needs to be reached within communities. Then, agreed-upon indicators must be subject to critiques and another round of deliberation involving community residents, government officials, data experts, social governance experts and NGOs/CSOs.

Part II: The Guiyang social governance and smart cities indicators

2.1 Guiyang social governance indicator system methodology

There is no consensus around methodologies to establish indices, not even general agreement on the best conceptual frameworks or standardized options to measure local government performance. In urban sustainable development many different approaches have been developed: from international rankings of cities based on different criteria such as quality of life, cost of living, innovation economy, city branding, personal safety or eco-city, to compendiums of best practices, the use of future scenarios or self-organizing maps.

The choices of component indicators of sustainability indices directly affect the results. Indicators are used to compare baselines- the current state of affairs- to goals- what the desired state in the future is. The selection process is inherently subjective, and inevitably involve value judgments as to what is important. This is also true for the weighing and aggregation process.²⁹

The Guiyang Social Governance and Smart City Indicator System approaches indicator development from a community engagement perspective. As described in Part III, the indicators were developed through a participatory methodology that involved both community members and expert input. The principles that are taken into account in the Index development process include:

- The indicators reflect community concerns and priorities
- The indicators reflect social governance issues that have been prioritised in the Sustainable Development Goals and by the Chinese government (e.g. increased government transparency)
- The indicators reflect items under government jurisdiction or that government policy influences
- The indicators reflect practical considerations concerning data collection and local government workload
- The indicators reflect both result indicators and input indicators and subjective indicators and objective indicators- in the sense that the data being collected is subjective- people's perceptions as measured, for example, through questionnaires- or objective- involving an impartial measurement such as counting the number of fire stations in a given community

29. UNDP Oslo Local Governance Centre (2016). *A User's Guide to Measuring Local Governance*.

The Guiyang Social Governance and Smart City Indicator System is composed of three levels. The first labels the overarching principle under which the other indicators are organised. These are: 'equitable development outcome', 'equitable urban resource distribution' and 'just means for resource distribution'. The second level describes the capability³⁰/resource type that the indicators fall into. These range from health, education, housing, and food, to transportation, public space, environment, safety and citizen involvement in governance. The third level breaks down the capability and resources categories into evaluative dimensions which are as comprehensive as possible to cover the concerns discussed in deliberations, balanced with the availability of data and data collection capacity. Accessibility, availability and affordability are commonly applied evaluative dimensions.

Box 1: International Best Practices: Community indicators

Box 1.1 Municipal-led, community-engaged: Whistler's community indicators system

Located in the Coast Mountains in British Columbia, Canada, Whistler is a well-known destination mountain resort with 10,000 permanent residents and over two million tourists each year. It is generally recognised as one of Canada's leaders in community sustainability planning, engagement and implementation.³¹ Whistler2020 is Whistler's long-term integrated community sustainability plan and highest level policy document guiding development.³²

Whistler2020's Monitoring and Reporting Program tracks and reports the current status and progress toward the Whistler2020 vision and sustainability objectives through core indicators, strategy indicators as well as other contextual community indicators. Core indicators provide a high level snapshot of community progress toward the vision. Strategy indicators provide more detailed information and measure progress toward the strategy descriptions of success. Contextual indicators provide other important information about the resort community.³³ The indicators are based on five guiding priorities, namely enriching community life, enhancing the resort experience, protecting the environment, ensuring economic viability, and partnering for success. There are more than 90 indicators selected through intensive community engagement processes and progress is reported at least annually. Data is collected from Tourism Whistler, Statistics Canada, Whistler Community Life Surveys and local utility providers.³⁴ The program provides a number of benefits and essential functions, including tracking progress toward Whistler's vision, ensuring transparency and accountability to stakeholders, as well as educating and engaging Whistler businesses, residents and visitors.

Box 1.2 Community-driven: Cordoba's indicator system

In Cordoba, the second-largest city in Argentina, the Our Cordoba Citizen's Network (Nuestra Cordoba) has established a set of 10 quality of life indicators with quantitative and qualitative data indicating the city's performance over time in relevant dimensions, e.g. green space, particulate matter, wealth distribution,

30. 'Capability' in this report refers to Amartya Sen's capability approach which differs from approaches that focus on resources. A capability approach has a specific focus on the quality of individual lives. 'Capability' enables people to achieve freedom for development. In Sen's work, capabilities include education, health, and political participation.

31. The Natural Step (2008). A Natural Step Case Study: The Whistler Case Study. Available from http://c.ymcdn.com/sites/www.gmicglobal.org/resource/resmgr/Docs/Whistler_NS_casestudy.pdf

32. Massy, Erica (2011). Whistler, Canada: Indicators of Sustainable Community Development. Red River College. Available from http://ericamassey.weebly.com/uploads/1/3/2/5/13250356/whistlers_sustainable_community_assessment_measuring_progress_in_the_21st_century.pdf

33. Resort Municipality of Whistler (2014). Whistler2020: Moving toward a Sustainable Future. Available from <http://www.whistlercentre.ca/sumiredesign/wp-content/uploads/2014/02/Whistler2020-Vision.pdf>

34. Resort Municipality of Whistler (2016). Whistler2020. Available from <https://www.whistler.ca/municipal-government/strategies-and-plans/whistler2020>

number of licensed vehicles, etc. Nuestra Cordoba is a non-partisan, non-governmental network that works with the participation of more than 200 citizens and 60 organisations including academia, civil society organisations, foundations, private enterprise, research institutes, etc., in the city of Cordoba. It is associated with the Latin American and the Argentinian Network for Fair Democratic and Sustainable Cities and Territories.³⁵ Its objective is to promote a city that is more fair, democratic and sustainable. As part of its activities and at the beginning of each mayoral term, the Our Cordoba Citizen's Network presents the mayor with a proposed "Plan of Objectives" for the administration's consideration and adoption. The Plan is intended as an instrument to enhance the clarity and transparency of government's proposed plans and actions. The 2015-2019 proposal covers three themes, each of which has associated sub-dimensions and quantifiable objectives: sustainable urban development (20 objectives), institutional development (19 objectives), and inclusive development (10 objectives).³⁶

As noted above, the Guiyang social governance indicator system was developed from community deliberation, refined with inputs from governmental officials and experts from academia, NGOs and the data industry, and categorised with references to existing theories. This section explains how the indicators were processed and categorised.

The second level and third level indicators were processed from raw indicators for issues raised during community deliberations. The second is resource/capacity based. During community deliberations, priority areas included health, education, housing, food, transport, education, public space, public safety, environment and community services. Multi-stakeholder deliberation contributed additional concerns include data and information openness, and the role of NGOs and CSOs in providing social services. These functional areas became the basis of the second level indicators.

The third level consists of the evaluative dimensions for each resource type and capacity. Through discussion, key concerns emerged such as: whether some of the resources, such as certain bus routes, kindergarten and primary schools, community clinics, etc. are available at a reasonable distance from where residents live, the price of living resources, access to services and facilities, the waiting time to solve problems, complaint channels etc. (see Appendix 1). These concerns and raw language were processed, categorised and labelled with four major evaluative dimensions: 'availability', 'affordability', 'accessibility', and 'efficiency'. In general, the definition of the four are as follow:

- i. Availability: the existence and location of facilities and services³⁷
- ii. Accessibility: access to information and access to facilities and resources regardless of age, gender, ethnicity, race, class, and physical ability. Access is evaluated from both a spatial and temporal perspective
- iii. Affordability: the price of facilities and services relative to income level
- iv. Efficiency: waiting time for problem solving under existing facilities and services, whether the facilities and services can efficiently prevent or quickly address incidences, such as crime, fire, traffic jams etc.

35. OECD (2016). *OECD Territorial Reviews: Cordoba, Argentina*.

36. Nuestra Cordoba (2015). Available from <http://www.nuestracordoba.org.ar/>

37. Ideally, urban facilities that support daily activities such as bus stops, food markets, community clinics, green and other public spaces should be within 15 minutes walking distance. It can vary when the cultural context changes.

Not all second level indicators have the full set of listed evaluative indicators. It depends on, first, whether they were identified as one of the key concerns during deliberations; second, whether it is technically appropriate and necessary to designate the specific concern to the second level indicators. For instance, availability of food is not a major concern in Guiyang, and accessibility of food was not raised during deliberations. Therefore, efficiency is not an evaluative dimension that is appropriate to assign to food.

Some second level indicators received additional evaluative indicators, such as 'adequate housing'. The indicators under this second-level indicator were developed out of concerns raised through community deliberation with reference to the definition of adequate housing proposed by the UN Human Rights Office of the High Commissioner. These include affordability, habitability, availability of services, materials, facilities and infrastructure, accessibility of information and facilities, and cultural adequacy. The indicator 'habitability' covers well people's concerns raised during discussions, which were about electricity, running water, heating, housing maintenance and so on.

With reference to social justice theories, the second and third level indicators are categorised in three dimensions: development outcome, the distribution of resources for development, and the means to access resource distribution. Development outcomes are the end results of resource distribution. Resource distribution itself is a direct result of fairness.³⁸ Distributive justice cannot be achieved without institutional justice³⁹ – the means for resource distribution. Spatial justice and inter-group justice are both valued in this indicator system.

2.2 Guiyang social governance indicator system

As laid out here, the description gives a definition for each level 3 indicator. The conceptual basis gives the sources for each indicators. It specifies whether the indicator references the community deliberation (community), theory (capability approach, the Sustainable Development Goals (SDGs), the Human Development Index (HDI), UN Human Rights Office of the High Commissioner, etc.), and/or the roundtable including experts (expert).

38. John Rawls (1971) proposed two principles for social justice, which are composed of liberty and equality. The Liberty principle argues that all people should be given equal rights to basic liberties -- resource in other words. In Rawls' definition, some rights are more significant or fundamental compared to others (Rawls, 1971). For instance, he argues that the rights to possess daily necessities such as a home are part of basic liberty, while the right to unlimited properties is not (ibid, 1971). The equality principle establishes distributive justice as one of the components of Justice as Fairness.

39. Iris Young's (1991) important contribution to the social justice debates was the concept of institutional justice. Confirming that the distributive dimension is crucial in defining social justice, Young explicitly points out that the contemporary philosophical debates around social justice ignore the institutional dimension, which often determines the patterns of distribution and results. As decision-making processes for resource distribution are usually dominated and controlled by a few people, the rules of the existing system themselves may actually exclude and oppress some groups of people and result in situations where it not possible to even achieve justice as defined by procedural justice supporters. In this sense, social justice should 'refer not only to distribution, but also to the institutional conditions necessary for the development and exercise of individual capacities and collective communication and cooperation' (Young, 1990:39). Distributive justice should be achieved through just distribution (Harvey, 1973). The principles of social justice, therefore, should be that people of different groups should have equal opportunities in: '(1) developing and exercising one's capacities and expressing one's experience, and (2) participating in determining one's action and the conditions of one's action (ibid, 1990:37)' - which are additional to the principles defined by Rawls. In other words, people from different social groups - age, gender, race, ethnicity, religion and physical ability - should be able to build capacity and give voice to their needs, be involved in decision-making processes that may impact their lives, as well as make decision on whether they should do a certain thing and what enabling environment should be provided for their own actions.

Table 2. Guiyang social governance indicators

Level 1	Level 2	Level 3	Code	Description	Conceptual basis
Equitable development outcome	Health equity	Life expectancy	1	Life expectancy in different areas and among different social groups	Community, capability approach and HDI
		Self-reported health	2	Personal health reporting in different areas and among different social groups	Community, capability approach
	Education equity	Enrolment rate	3	Enrolment rate in different areas and among different social groups	Community, SDG, capability approach, HDI
		Middle school graduation examination	4	Graduation examination performance in different areas and among different social groups	Community, SDG, capability approach, HDI
	Shared happiness	General happiness	5	Happiness of people in different areas and among different social groups	Capability approach and HDI
Equitable urban resource distribution	Adequate housing	Housing affordability	6	Rental price lower than one third of average income, and housing price proportional to average income	Community, UN Human Rights Office of the High Commissioner
		Habitability	7	Adequate space, protection from cold, damp, heat, rain, wind or other threats to health, structural hazards, and disease vectors. High satisfaction with living conditions	Community, UN Human Rights Office of the High Commissioner

	Availability of services, materials, facilities and infrastructure	8	Access to safe drinking water, sanitation, energy for cooking, heating and lighting, sanitation and washing facilities, etc.	Community, UN Human Rights Office of the High Commissioner
		9	Easy to retrieve rental/sale information, regardless of age, gender, ethnicity, race, class and physical ability	Community, UN Human Rights Office of the High Commissioner
		10	Respect and take into account the expression of cultural identity and ways of life	Community, UN Human Rights Office of the High Commissioner
	Adequate food	11	Food prices proportional to income	Community
		12	Availability of safe and healthy food in markets	Community
	Adequate transportation	13	Good public transport networks connecting community and employment, hospital, schools, recreational facilities, etc.	Community
		14	Easy to retrieve public transport information, inclusive operating hours, ⁴⁰ good supportive barrier-free facilities for social groups regardless of age, gender, ethnicity, race, class and physical ability	Community
		15	Price proportional to individual income	Community
		16	Low incidence of traffic congestion; high satisfaction with mobility	Community

40. The operating hours of the public transport system after midnight is very important to some social groups, for example, low-income groups who may have night-time employment. Insufficient night routes marginalise low-income women and men and reduce job options, and contribute to concerns over safety and mobility.

41. Operating hours for quality education is not a primary issue in the daytime in China, but there is an argument for extending the opening hours of school facilities. For many social groups including low-income groups and migrant workers who have not received a quality education, or have had to enter the workforce at the end of the nine-year compulsory education period, night schools and continuing education are of considerable interest.

Quality primary and secondary education	Accessibility of information, facilities and services	17	Easy to retrieve quality education information, inclusive operating hours, ⁴¹ good supportive barrier-free facilities for social groups regardless of age, gender, ethnicity, race, class and physical ability	Community, SDG
	Affordability of quality education	18	Tuition fee proportional family income	Community, SDG
	Availability of services and facilities	19	Sound spatial arrangement of healthcare services including community clinics	
Adequate healthcare	Accessibility of information, facilities and services	20	Easy to retrieve healthcare information, good supportive barrier-free facilities for social groups regardless of age, gender, ethnicity, race, class and physical ability	Community
	Affordability of healthcare	21	Medical insurance reimbursement proportional to individual income	Community
Open public space	Availability of public space	22	Dense arrangement of public space in communities or neighbourhoods	Community
	Accessibility of information, facilities and services	23	Easy to retrieve information of public space, inclusive opening hours, good supportive barrier-free facilities for social groups regardless of age, gender, ethnicity, race, class and physical ability	Community

	Safe habitat	Availability of police, fire fighting facilities and road lights	24	Sound spatial arrangement of police stations, fire fighting facilities, fire corridors, road lights coverage and brightness, high satisfaction with safety	Community
		Accessibility of facilities and services	25	Easy to report problems	Community
		Responsiveness to problems	26	Short waiting time for solving problems	Community
		Efficiency of facilities and services	27	Low crime rate and fire incidence	
		Healthy environment	31	Clean air, safe water and soil, efficient waste management, high satisfaction with environment	Community
	Active community services	Accessibility of information, facilities and service	32	Easy to retrieve information of community services and events, inclusive opening hours, good supportive barrier-free facilities for social groups regardless of age, gender, ethnicity, race, class and physical ability	Community
		Activeness	33	Frequent community cultural and recreational activities	Community
		City data integration and openness	34	Zero silos for city data, ⁴² and open data available to the public	Community and capability approach
	Just means for resource distribution	Open public information			

42. This refers to cross-department data, including healthcare, education, transport, etc. being pooled onto one data platform that can be easily accessed.

43. Based on Arnstein's (1969) Ladder of Participation.

		Openness of city and community affairs	35	Open governmental and community information	Community, experts, capability approach
	Smooth channels for participation in public affairs	City and community complaint channel	36	Barrier free complaint channels at all level	Community, experts, capability approach
		Community organisation and activeness	37	Dense community organisation and active service	Community, experts, capability approach
		Media oversight	38	Free critique from the media on public affairs	Experts, capability approach
		Participatory mechanisms in decision-making	39	The degree ⁴³ of involvement of the public in urban planning, and other policy planning processes	Experts, capability approach

2.3 Value generation process for indicators

Traditional household data and unconventional 'big data' can both be used to track indicators developed based on community input. In this project, big data and traditional government statistics are both used for the indicators. The unit for measurement is one community⁴⁴ in the 'big data' data set. Government statistics are less detailed geographically. Therefore, the 'big data' data set is aggregated to merge with the government data set. As data is not available for all indicators, this practice only covers some of the indicators. The advancement of data infrastructure is expected to make measurements easier in the near future and indicators will begin to be tracked as data sources become available. An interactive map is being developed to visualise the indicators in the selected communities. When different indicator sets are chosen, it will generate diagrams to show the performance in the communities. The map is expected to become available in June 2017 and will expand as more indicator values are able to be calculated.

The first step to generating values for the indicators is to identify the scope of research, within which communities are identified as research objects. By combining online and manual mapping, the project team outlined the boundaries of the communities and then attributed data collected from online sources to each community as the value of certain indicators. For indicators that require calculation, raw data collected from online sources were inputted into different algorithms to generate results for the indicator value. For indicators that require surveys or non-public government data, the value is generated accordingly.

The methodology is as follows:



1. Defining scope of research

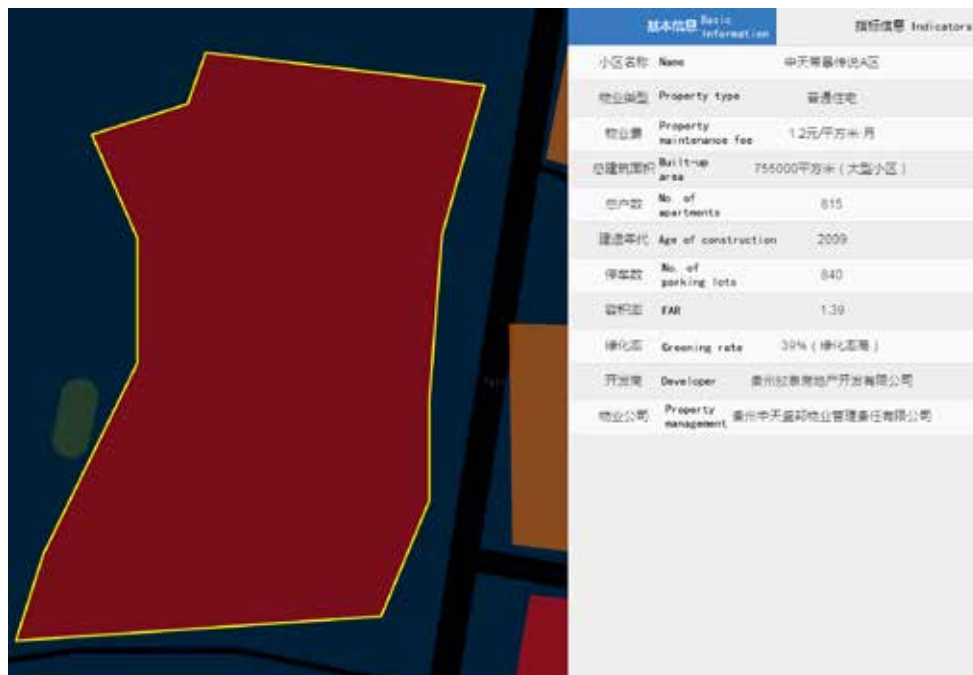
44. In this case, community refers to the residential area administered by one residents' committee.



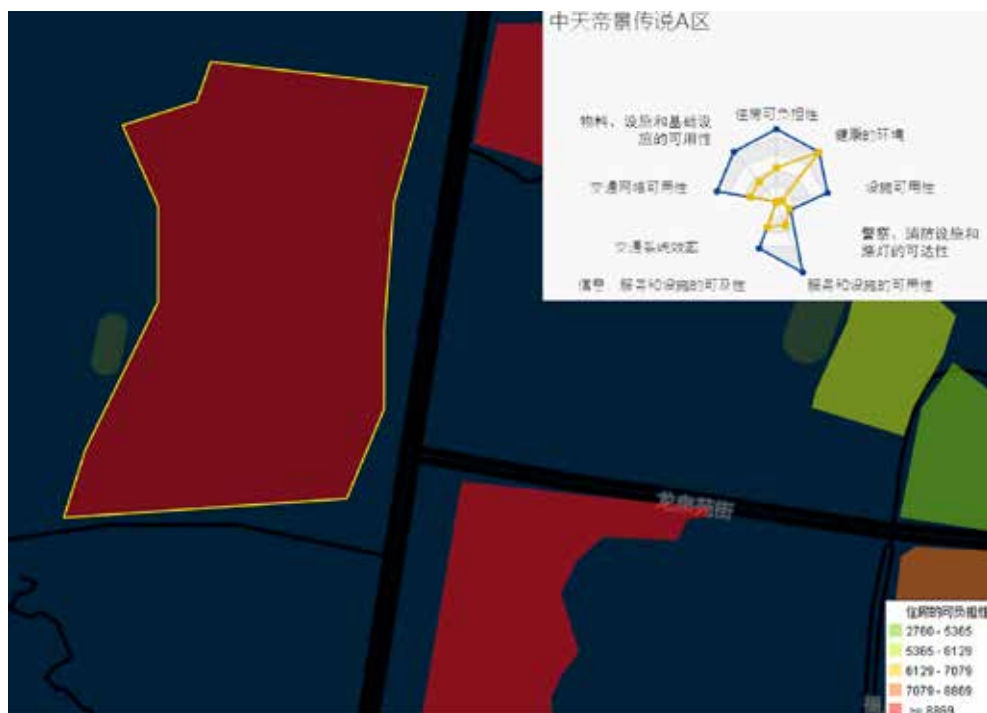
2. Locating the central point of each community based on data from the Internet



3. Outlining boundaries of each community with online map as a reference, and processing data



4. Matching community data and the boundaries collected from the Internet to provide value of certain indicators



5. Generating value using algorithms for indicators that require calculation

Using the data application method of 'community profile'⁴⁵ developed by UrbanXYZ, the scope of research covers six administrative districts in Guiyang city: Wudang, Baiyun, Yunyan, Guanshanhu, Nanming and Huaxi, where the boundaries of 903 communities have been mapped out and the value of some indicators have been generated after data collection and calculation.

45. "Community Profile" is a data evaluation system developed by the Beijing City Quadrant Technology Co., Ltd., (UrbanXYZ) which aims to use urban big data to enhance the quality of community development and management.

2.4: Data collection and calculation

Table 3: Data sources for indicators

Level 1	Level 2	Level 3	Code	Description	Potential data source
Equitable development outcome	Health equity	Life expectancy	1	Life expectancy in different areas and among different social groups	Census
		Self-reported health	2	Personal health reporting in different areas and among different social groups	Census
	Education equity	Enrolment rate	3	Enrolment rate in different areas and among different social groups	Government statistics
		Middle school graduation examination	4	Graduation examination performance in different areas and among different social groups	Government statistics
	Shared happiness	General happiness	5	Happiness of people in different areas and among different social groups	Resident questionnaires Proportion of resident respondents that are satisfied regarding certain questions
	Adequate housing	Housing affordability	6	Housing/rental price is proportional to income	Open online data; Indicator value for Guiyang obtained in May 2017
Equitable urban resource distribution					

	Habitability	7	Adequate space, protection from cold, damp, heat, rain, wind or other threats to health, structural hazards, and disease vectors, and high satisfaction with living conditions	Open online data; Indicator value for Guiyang obtained in May 2017 Scores for building quality in the community from professional researchers Scores based on organisation of parking lots, illegal occupancy of roads, disorganised parking and other conditions from professional researchers Resident questionnaires
		8	Access to safe drinking water, sanitation, energy for cooking, heating and lighting, sanitation and washing facilities, etc.	See Note 1
	Availability of services, materials, facilities and infrastructure	9	Easy to retrieve rental/sale information, regardless of age, gender, ethnicity, race, class and physical ability	
	Accessibility of information and facilities	10	Respect and take into account the expression of cultural identity and ways of life	
	Cultural adequacy	11	Food prices proportional to income	
		12	Availability of safe and healthy food in markets	
	Adequate food			

Adequate transportation	Availability of transport networks	13	Good public transport networks connecting community and employment, hospital, schools, recreational facilities, etc.	<p>Bus stop coverage around the communities</p> <p>Subway station coverage around the communities</p> <p>Commuting distance of working population residing in the communities</p> <p>Average commuting hours of working population residing in the communities</p> <p>Average travel time from communities to the recreational destination of community residents</p> <p>For No.1-2, see Note 2</p> <p>For No.3-5, see Note 3</p>
	Accessibility of information, service and facilities	14	Easy to retrieve public transport information, inclusive opening hours, good supportive barrier-free facilities for social groups regardless of age, gender, ethnicity, race, class and physical ability	

	Affordability of service	15	Price proportional to individual income	
		16	Low incidence of traffic congestion, high satisfaction with urban mobility	Resident questionnaires
	Quality primary and secondary education	17	Easy to retrieve quality education information, inclusive opening hours, good supportive barrier-free facilities for social groups regardless of age, gender, ethnicity, race, class and physical ability	
		18	Tuition fee proportional to family income	
		19	Sound spatial arrangement of healthcare services including community clinics	Healthcare convenience index of communities See Note 4
		20	Easy to retrieve healthcare information, inclusive opening hours, good supportive barrier-free facilities for social groups regardless of age, gender, ethnicity, race, class and physical ability	
	Open public space	21	Medical insurance reimbursement proportional to individual income	
		22	Dense arrangement of public space in communities or neighbourhoods	

		Accessibility of information, facilities and services	23	Easy to retrieve information of public space, inclusive opening hours, good supportive barrier-free facilities for social groups regardless of age, gender, ethnicity, race, class and physical ability	
	Safe habitat	Availability of police, fire fighting facilities and road lights	24	Sound spatial arrangement of police stations, fire fighting facilities, fire corridors, road lights coverage and brightness	
		Accessibility of facilities and services	25	Easy to report problems	
		Responsiveness to problems	26	Short waiting time for solving problems	
		Efficiency of facilities and services	27	Low crime rate and fire incidence, high rates of satisfaction with community safety	Resident questionnaires
	Green and protected environment	Availability of facilities	28	Even spatial arrangement for waste management and monitoring water, air, noise pollution, and the dense coverage of green space in different areas	Open online data Indicator value for Guiyang obtained in May 2017
					Average Air Quality Index in the past year from the monitoring station that covers the community, from the China National Environmental Monitoring Center

					Green space rate in a 15 minute-walk radius from the central point of the community
			29	Responsiveness	Short waiting time to address environmental hazards
			30	Accessibility of green space	Open green space (not fenced) Open online data; Indicator value for Guiyang obtained in May 2017 Green space rate in a 15 minute-walk radius from the central point of the community
			31	Healthiness of environment	Clean air, safe water and soil, efficient waste management, high satisfaction with environment Average Air Quality Index in the past year from the monitoring station that covers the community, from the China National Environmental Monitoring Center Community public hygiene: scores of public hygiene by professional researchers Resident questionnaires

	Active community services	Accessibility of information, facilities and service	32	Easy to retrieve information on community services and events, inclusive opening hours, good supportive barrier-free facilities for social groups regardless of age, gender, ethnicity, race, class and physical ability	See Note 1
		Activeness	33	Frequent community cultural and recreational activities	Government official statistics
Just means for resource distribution	Open public information	City data integration and openness	34	Zero silos for city data, and open data available to the public	
		Openness of city and community affairs	35	Open governmental and community information	Government official statistics
	Smooth channel for participation in public affairs	City and community complaint channel	36	Barrier free complaint channels at all level	Government official statistics
		Community organisation and activeness	37	Dense community organisation and active service	Government official statistics Number of active community organisations, including party organisations, autonomous organisations, intermediary organisations and professional service organisations
		Media oversight	38	Free critique from the media on public affairs	Government official statistics
		Participatory mechanism in decision making	39	The degree of the involvement of the public in urban planning, and other policy planning processes	Government official statistics

Note 1:

Open online data are used for locations of facilities in this section.

Indicators for dining, shopping, entertaining, and convenience facilities are calculated in the same way. For example, the dining facilities indicator is calculated using the following steps. First, a “life circle” with a 15 minute-walk radius around each community is mapped using Baidu Route Planning API. Next, the number of dining facilities in this circle is counted. Third, the community with the greatest number of dining facilities is established as a reference value and data from other communities are normalised accordingly to generate the value for the dining facilities indicator.

Table 4: Types of facilities

Category	Sub-category	Type of facilities
Shopping facilities	Super markets and convenience stores	
	Shopping malls	Shopping centres, department stores
	Markets	agricultural and sideline products markets, fruit markets, vegetable markets, aquatic products markets
Entertaining facilities	entertaining facilities	Cinemas, Karaoke, Internet café, table and card game centres
	Sport facilities	
Convenience facilities	Financial services	ATMs, banks
	Daily-life services	Travel agencies, post offices, logistics and couriers, telecommunication service centres, water supply service centres, power service centres, hairdressing and beauty salons, maintenance centres, photo shops, public baths and massage parlours, laundries, remover companies

Table 5: Example- Indicator calculation for dining facilities in three communities:

Community	Number of dining facilities within 15 minute-walk life circle	Normalised value (indicator value)
A	7	0.7
B	10 (the maximum as reference value)	1
C	9	0.9

Note 2:

Bus coverage: number of bus stations in a 15 minute-walk radius from the central point of the community

Subway coverage: classification based on time needed to walk from the central point of the community to the nearest subway station (less than 5 minutes, 5-10 minutes, 10-15 minutes, more than 15 minutes)

Note 3:

Average commuting distance, average commuting time, and daily-life travel distance: Location data from residents' mobile phones need to be collected and processed to identify "anchor location" of residents' living, working, leisure and other behaviours. Location data is one of the common data sources used for big data analysis. Reflecting temporal-spatial behaviours, location data enable planners to better understand spatial, temporal, and intergroup heterogeneity. Temporal-spatial behavioural data shed light on residence-workplace distribution features, behavioural patterns, spatial connection features and spatial preferences among different groups. With coordinates of longitude and latitude as two dimensions of the resident's location data, it is necessary to cluster these data points to identify "anchor points", which means to discover the cluster most frequented at a particular time (e.g. residence at night, and workplace in the daytime on week days) and identify the centre of the cluster as an anchor point. In this way, residence, workplace and leisure destinations can be identified and average commuting distance and time and daily-life travel distance can be calculated.

Calculation of anchor points requires cluster analysis, or clustering, which is the process of quantitatively grouping a set of data using mathematical tools. Cluster analysis consists of several modes which are vectors, or points in multidimensional space. In anchor point calculation, a mode is a two-dimensional space vector with coordinates of longitude and latitude. The results of clustering is to group these modes in such a way that objects in the same group (a "cluster") are more similar to each other than to those in other groups (clusters). Based on diverse algorithms, cluster analysis can be categorised into distribution-based clustering, hierarchical clustering, density-based clustering, grid-based clustering, and model-based clustering.

A comparison of different clustering algorithms from scikit-learn, a python machine learning module, is given as follows:

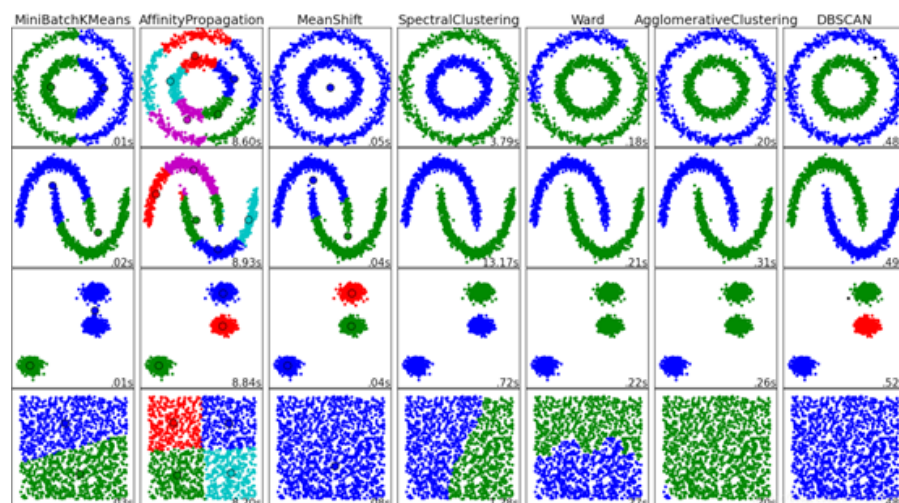


Figure 1. Comparison of different scikit-learn⁴⁶ clustering algorithms

After comparing diverse algorithms, DBSCAN algorithm (the rightmost above) is adopted for anchor point calculation. DBSCAN (Density-Based Spatial Clustering of Applications with Noise) is a density-based algorithm with significant advantages over other algorithms as follow:

46. Available from <http://scikit-learn.org/stable/modules/clustering.html>

- 1) No need to input the quantity of clusters in advance, and thus suitable for the anchor point calculation with multiple living or workplace locations
- 2) Allowing identification of clusters in arbitrary shapes
- 3) Allowing identification of noise

There are two basic input parameters for DBSCAN:

1) Neighbourhood E:

The area with a given radius of E. In anchor point calculation, location points in neighbourhood E are considered as one cluster, i.e. an anchor point

2) Core object:

Core object (or threshold value) stands for the lower limit of the number of occurrence. In anchor point calculation, if the number of days of location points in a certain cluster exceeds the threshold value, the cluster can be identified as an anchor point.

It is necessary to impose an additional restrictive condition on DBSCAN, i.e. the time span of location points must exceed a certain threshold value, to ensure the behaviours of “living” or “working” is for the long term, instead of short-term behaviours such as business trips.

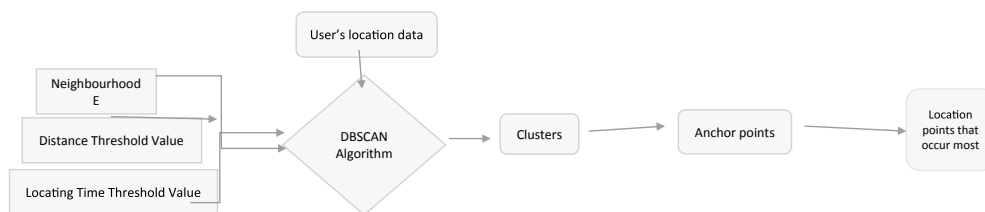


Figure 2. Anchor point calculation based on DBSCAN

Note 4:

Education and healthcare facilities: increased weighting of facilities' quality in addition to the above calculation, i.e. key primary and middle schools and comprehensive hospitals are heavily weighted

For example, the indicator calculation of education facilities in three communities, with key facilities weighting 0.6 and non-key facilities 0.4:

Table 6: Calculation of education facilities indicator

Community	Number of education facilities in 15 minute-walk life circle		Normalized value (indicator value)		Indicator value
	Key facilities	Non-key facilities	Key facilities	Non-key facilities	
A	1	2	0.5	0.67	$0.5 \times 0.6 + 0.67 \times 0.4 = 0.568$
B	0	3 (reference value)	0	1	$0 \times 0.6 + 1 \times 0.4 = 0.4$
C	2 (reference value)	1	1	0.33	$1 \times 0.6 + 0.33 \times 0.4 = 0.732$

Note 5:

Ambulance response time: time needed to drive from the central point of the community to the nearest emergency centre during off-peak hours, calculated by Baidu Route Planning API

AED response time: time needed to walk from the central point of the community to the nearest Automated External Defibrillators (AED), calculated by Baidu Route Planning API

Public security response time: time needed to drive from central point of the community to the nearest police station during off-peak hours, calculated by Baidu Route Planning API

Fire system response time: time needed to drive from the central point of the community to the nearest fire station during off-peak hours, calculated by Baidu Route Planning API

Accessibility of emergency shelters: time needed to walk from the central point of the community to the nearest emergency shelter

2.5 Updating and maintenance

Indicators require regular updating and maintenance. It is recommended that the general information and housing prices of the community should be updated every month and other indicators every year to keep track of changes of indicators and identify emerging problems in time.

2.6 Result of indicators for Guiyang

With the available data, the project generated values for 8 indicators in 898 communities. The results for the 5 communities involved in the indicator generation process are shown in Table 7 as an example. The full table is available on the UNDP China website⁴⁷ and will be incorporated into the interactive map available in June 2017. All 898 communities are included in the maps of visualised data. This table and maps are shown here to highlight how top-down and bottom-up approaches can be combined for decision making. No judgement on the performance of each community on each indicator is made.

47. Available at http://www.cn.undp.org/content/china/en/home/library/democratic_governance/smart-cities-and-social-governance--guide-for-participatory-indi.html

The measured indicators are as follow (see maps in Appendix 3):

- Indicator 6. Adequate housing – Housing affordability (see Map 2)
- Indicator 8. Adequate housing - Availability of services, materials, facilities and infrastructure (see Map 3)
- Indicator 13. Adequate transportation - Availability of transport network (see Map 4)
- Indicator 17. Quality primary and secondary education - Accessibility of information, facilities and services (see Map 5)
- Indicator 19. Adequate healthcare - Availability of services and facilities (see Map 6)
- Indicator 24. Safe habitat - Sound spatial arrangement of police stations, fire fighting facilities, fire corridors, road lights coverage and brightness (see Map 7)
- Indicator 28. Green and protected environment - Availability of facilities (see Map 8)
- Indicator 31. Green and protected environment - Healthiness of environment (see Map 9)

Housing affordability can refer to the aggregation of the price of property management, housing prices, average rental price and the mean value of rental prices. In this case, as only housing price is available, the value was generated through the following equation:

$$\text{Housing-income ratio} = \text{housing price} * 80 \text{ m}^2 / 29502 \text{ RMB} / 3 \text{ persons}^{48}$$

Availability of services, materials, facilities and infrastructure for high habitability is assessed through geographical data on supermarkets and convenience stores, shopping malls, food markets, entertainment facilities, sport facilities, financial services, and daily-life services within a 15-minute walking distance. The accessibility of information, facilities and services for quality primary and secondary education, and availability of services and facilities for adequate healthcare was evaluated in the same way. Availability of adequate transportation networks is only assessed through bus stop coverage. Sound spatial arrangement of police stations, fire fighting facilities and fire corridors was assessed through data from the Baidu Route Planning API. Availability of facilities for a green and protected environment is assessed through the amount of green coverage within a 15-minute walking distance. Clean air, safe water and soil, efficient waste management and high satisfaction with a green and protected environment is currently only assessed through air quality, but will expand to include other points as data becomes available.

48. Internationally, housing is considered affordable when the price ranges from 1/6 to 1/3 of average household income. 80m² is adequate for one household. In 2016, the average disposable income of a three-person urban household in Guiyang was RMB 29502.

Table 7: Data values for 8 indicators for selected communities

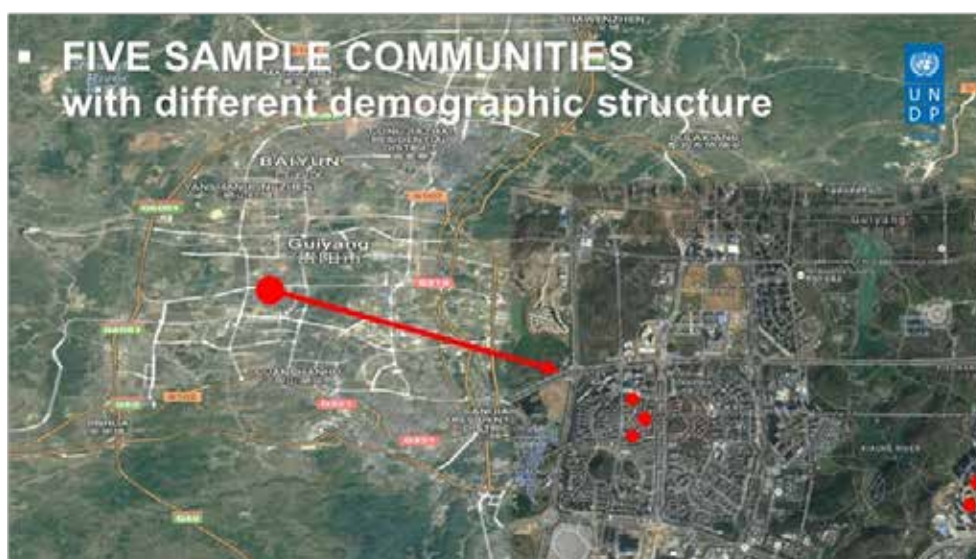
Community ID	Name of community	Average housing price (RMB)	Indicator 6: Housing Affordability	Indicator 8: Housing: Availability of services, materials, facilities and infrastructure	Indicator 13: Availability of transport networks	Indicator 17: Education: Accessibility of information, facilities and services	Indicator 19: Healthcare: Availability of services and facilities	Indicator 24: Safety: Availability of police, fire fighting facilities and road lights	Indicator 28: Environment: Availability of facilities	Indicator 31: Healthiness of environment
494	Songjingge Community	6515	5.889	0.103	0.357	0.101	0.079	0.938	0.00	0.81
498	Bishuiyuntian Community	4600	4.158	0.269	0.357	0.139	0.209	0.813	0.00	0.81
523	Zhongtian A Community	9310	8.415	0.634	0.881	0.457	0.736	0.938	0.00	0.80
833	Jincuiwan Community	5148	4.653	0.065	0.214	0.077	0.065	0.875	0.00	0.80
840	Meidilincheng Community	5109	4.618	0.162	0.095	0.147	0.138	0.875	0.00	0.81

Part III: Indicator Development in Guiyang: Tools and Processes

3.1 Background of the sample communities

Guiyang is the capital of Guizhou province in Southwest China. It is located in the centre of the province, situated in the east of the Yunnan–Guizhou Plateau, and on the north bank of the Nanming River, a branch of the Wu River. The city has an elevation of about 1,100 metres (3,600 ft) and an area of 8,034 square kilometres (3,102 sq mi). Its population was 4,324,561 as of the 2010 census, out of whom 3,037,159 lived in the 6 urban districts – Nanming, Yunyan, Huaxi, Wudang, Baiyun, Guanshanhu and Kaiyang.

When the project started, the project team met with Guanshanhu District Government to select the sample communities. The Bihai and Huizhan Neighbourhoods (街道) were selected for the community deliberation.



Bihai Neighbourhood has 12 community⁴⁹ residents' committees (居委会) serving over 20,000 people. Over 30% of the population is above 60 years old and the average age of permanent residents is 38-42. Within the neighbourhood, two communities are high-end residential. The average monthly income of the other communities is between RMB 2000-3000. 70% of the retired population are working class retired from the coal mines.

The infrastructure and transport accessibility of Bihai is generally good. The area was urbanised in the early 2000s. After nearly two decades of development, the services infrastructure, including post offices, banks and ATMs, supermarkets, restaurants, etc., within 15-minute walking distance is advanced. Waste management is in place and the service is regular. Crime is relatively low, with no murders recorded although theft is reported on occasion. Within the jurisdiction, there are 4 private kindergartens, two public primary schools, and one public junior middle school. Public kindergartens are under construction to meet soaring demand. Community clinics are open in all

49. Community' is defined as the jurisdiction of each residents' committee, which is assigned by neighbourhood service centres.

communities. The closest public hospital is within the Bihai Neighbourhood. Guanshanhu Park is 10 minutes away by car. However, some of the communities have unstable electricity and water supply due to aging equipment. The neighbourhood service centre has set up an 'Office for Complaint' as the channel to address residents' concerns.

Huizhan Neighbourhood is more recently developed, starting in 2009. It covers 8.14 km². The population rapidly grew from 2012. Currently, it has over 31,500 residents registered. Two thirds of the population are permanent residents.⁵⁰ Among the registered residents, people aged above 60 are less than 5%. Residential communities in Huizhan are mostly commercial developments, and the housing price is relatively high. The average monthly income of residents is over RMB 5000.

Currently, there are 364 commercial facilities, and 11 kindergartens, 2 public primary schools and 3 public junior middle schools. 4 kindergartens and 2 public primary schools are under construction. There are community clinics and the nearest public hospital is 4.5 kilometres away. Guanshanhu Park is in the neighbourhood. The Neighbourhood Service Centre offers 'college for the elderly' (continuing education for seniors), summer camp for children, and other free activities. Postal service covers the whole jurisdiction. Parking lots are sufficient for current demand. The crime rate is rather low. Channels for complaints are available at the community level, neighbourhood level, and city level. At the city level, 12345 is the mayor's hotline for city-wide issues. The crucial challenge in Huizhan is insufficient personnel for neighbourhood service support. The density of Huizhan is much higher, and the population scale is much larger, compared to Bihai, but the local government personnel is only half of the latter.

Five communities were further identified within the Bihai and Huizhan Neighborhoods: Bishuiyuntian, Jincuiwan, and Songjingge in Bihai, and Meidilincheng Shidai and Huizhan Group A in Huizhan. These five communities all have distinctive features. While Bishuiyuntian, Jincuiwan and Songjingge are mainly composed of retired and elderly working class residents, Songjingge has residents with higher incomes. The population in Meidilincheng Shidai and Huizhan Group A is relatively high income, but is generally younger than the higher income communities in Bihai.

Box 2. Roles and responsibilities of local urban government In China

Overview

Since the launch of the "Organisational Act of the Urban Sub-district Office" in 1954, the urban governance mechanism in China is organised as city-district-street-community.

The city (municipal) government and the district government have different jurisdictions. Municipal governments usually have jurisdiction over a number of districts, while district governments have full autonomy in their own areas. The municipal government is the highest administrative organ in the urban area. It implements the Municipal People's Congress and its Standing Committee's resolutions, as well as orders and decisions from the national and provincial administrative organs. The municipal government leads the work of the

50. That is, they have been residing in the community for longer than 6 months and are registered to live there.

district governments. They jointly implement the national economic and social development plans, budget management, and economic, education, science, culture, health, sports, environmental protection, urban and rural construction, finance, public security, ethnic affairs, juridical administration, supervision, and other administrative work. They are responsible for protecting people's property and the personal rights of citizens.⁵¹

The street-community is the frontline of urban management. The street office (街道) is the most basic unit of government, and has a number of community residential committees (居委会) under its jurisdiction. As the lowest level of administrative power, the street office not only serves as the representative of the district government, but also has a number of social functions and thus connects government and society. The street office has long played an important role in urban governance, community building and integrated management. With the acceleration of urbanisation, the increasing responsibility of the street office include livelihoods, economy, management, etc.⁵²

Residential committees are an important vehicle for self-management in the community linked to concepts of socialism and democracy with Chinese characteristics. As important bridges and ties between the government and the people, residential committees serve to publicise laws and regulations, protect legitimate rights and property, promote education, carry out activities to establish spiritual civilisation (精神文明), assist in public affairs and welfare, settle disputes, maintain public security, as well as act as a channel to reflect opinions, proposals or requests from the public to the government.⁵³

In 2011, the Ministry of Civil Affairs issued the "Guidance on the Strengthening of Urban Community Residence Committees"⁵⁴ which encouraged the enhancement of the structure of local governance and strengthening of the function of residents' committees by 2020. Some municipalities and districts of municipalities have been experimenting with changes to the street committee structure to remove one layer of urban management. Guiyang has initiated some of the most thoroughgoing reforms and garnered praise from the Ministry of Civil Affairs.

Practice in Guiyang

The municipal government in Guiyang has jurisdiction over six districts and three counties. The municipal and district governments serve similar roles as governments in other Chinese cities. In May, 2012, the Executive Committee of the Guiyang Municipal Government issued "Interim Measures of Guiyang Municipality for Community Management". According to the document, all the street offices (街道办事处) in Guiyang would be dissolved before May 31st, 2012. New communities would be established and they will provide public services to community residents. The responsibilities of previous street offices would be returned to district governments. The newly established neighbourhood service centres (社区服务中心) are directly controlled by district governments. As the terminus of urban management, a neighbourhood service centre serves as the most important and direct channel for public interest demands. It provides public services, optimizes management, maintains social stability, and provide services related to employment, culture, sports, health, etc.⁵⁵ Urban governance in Guiyang now follows the city-district-neighbourhood model.

51. Qian, Z. (2008). *Chinese Urban Governance System based on Sustainable Development: Theoretical Explanation and Action Analysis*. *Urban governance*, 15(3): 150-155. [In Chinese]

52. Rao, C.; Chang, J. (2011). *Historical Changes of Sub-district Office and Perfection of its System*. *Chinese public administration*, 2. [In Chinese];

53. Yu, J. (2009). *Roles of Residential Community in Urban Governance*. *Journal of the Party School of Qingdao Municipal Committee*, 3: 33-36. [In Chinese];

54. Available at: <http://www.mca.gov.cn/article/zwgk/fvfg/jczqhsqjs/201011/20101100113635.shtml>

55. Guiyang Municipal Government (2012). *Interim Measures of Guiyang Municipality for Community Management*. Available from http://xxgk.gygov.gov.cn/xxgk/jcms_files/jcms1/web1/site/art/2012/5/23/art_88_60080.html

3.2 Community mobilisation

3.2.1 *What is community mobilisation?*

‘Mobilisation’ was initially a military term, which referred to the process of assembling and preparing resources – troops, equipment and supplies – for war. Community mobilisation has a similar meaning. It can be defined as a process whereby the numerous resources of local groups are gathered to be used to achieve a common vision and goal. Information dissemination is used to motivate the participation of community residents in the project process. People are mobilised to provide their intellectual inputs, physical labour, tools, and other resources.

3.2.2 *Why is community mobilisation important?*

To a great extent, community mobilisation is one of the keys to success for projects such as the Guiyang smart city and social governance research collaboration which require mass participation of people and collective action. Mobilisation informs stakeholders of project goals, approaches, and outcomes. Information dissemination helps the potentially affected population to understand the significance of the project and the advantages of participation. Good community mobilisation can ensure that there is not only a high participation rate to ensure the representativeness and legitimacy of the outcomes of deliberation, but can also channel high quality intellectual, in-kind and even financial resources to ensure the effectiveness of a project.

3.2.3 *What are the tools for community mobilisation?*

All information dissemination tools can be used, such as radio, television, posters, leaflets, billboards and assemblies for community mobilisation. In the digital era, social media such as Facebook and chat groups, are available tools. Different tools have different impacts in terms of breadth and depth. Television often can have the broadest impact. In developing countries where illiteracy is high, radio has the broadest use and effect in comparison with other mediums. Leaflets, billboards, posters and assemblies can be effective, but restricted geographically. Social media is more effective among younger generations who have the skills and interest in digital tools. The design of communication materials is important as well. Different language and design can target different potential audiences and participants.

The selection of tools depends on the project objectives, target group and budget. The scale of the project- district-wide, city-wide, or nation-wide-determines the choice of tools used for mobilisation. In most cases, combined methods are most useful.

3.2.4 *What is needed for community mobilisation?*

Different types of community mobilisation need different support. The main need is for human resources. Staff from community-based organisations are normally among the most important links for a community-based project. They are familiar with their communities and beneficiaries, and know the platforms used most often for communication within the communities. Community-based organisations also often have professional social workers who know how to interact and persuade community people to participate in the project initiatives.

Temporarily recruited volunteers can also be a great resource for community mobilisation, but the disadvantage is that 'outsider' volunteers are quite often not known to the community people. They are seen as 'strangers'. Behaviour and clothing that is different from the local community may impact trust. Distrust can significantly affect the efficiency of community mobilisation, as the information disseminated may be deemed unreliable or fake, and there is suspicion as to the true motivations of the project. This may result in lack of interest from community members. However, sometimes external organisers can have a positive impact if they are seen as neutral parties or as advocates for international norms around human rights or sustainable development if working in a community that has internal conflicts or vested interests that are negatively impacting the community. Training is needed for both professional staff from community-based organisations and temporary volunteers. The objectives of training should be to familiarise the volunteers with the purpose of the initiatives, the organisational culture of the project initiators and other norms and values of the initiators. A combination of 'outsiders' and 'insiders' can often be the most effective.

3.3.5 Mobilisation for the Smart Cities and Social Governance Research Project

In the smart cities and social governance index project, community mobilisation followed four steps:

- Step 1. Gain community support
- Step 2. Recruit volunteers
- Step 3. Train community staff and volunteers
- Step 4. Disseminate information

To win support from the communities, the project first reached out to local NGOs, neighbourhood service centres and residents' committees. After the agreement between UNDP and the Guiyang municipal government was signed, the project team first met with the District government of Guanshanhu where the Bihai and Huizhan Neighbourhoods are located to introduce the project to them. The District government helped pave the way for the project team to connect with the neighbourhood service centres. The project team then met with the service centres also to explain the project and gain support, and get baseline data (demographics, income etc.) on the communities. The service centres were also able to explain to the project team what kinds of services they offered, what kinds of channels were currently available for community engagement with the government and what kind of data the service centres currently collected on social governance issues. As well, the service centre suggested appropriate communities in which to hold deliberations, based on the demographic and income levels. The centres also suggested the time for deliberations. The original plan to hold deliberations in each community over two weekends (one day each) was changed to hold over two days in one weekend. The service centre felt that there would be better attendance and that people would be better able to remember the discussions from one day to the next. The service centres then introduced the project team to the residents' committees.

It should be noted that, as Chinese society is dominated by 'top-down' culture, the fastest way to gain trust at the grassroots level is to have support and directives from higher levels of government. Engaging each level of government in order was necessary to gain further support from lower levels.

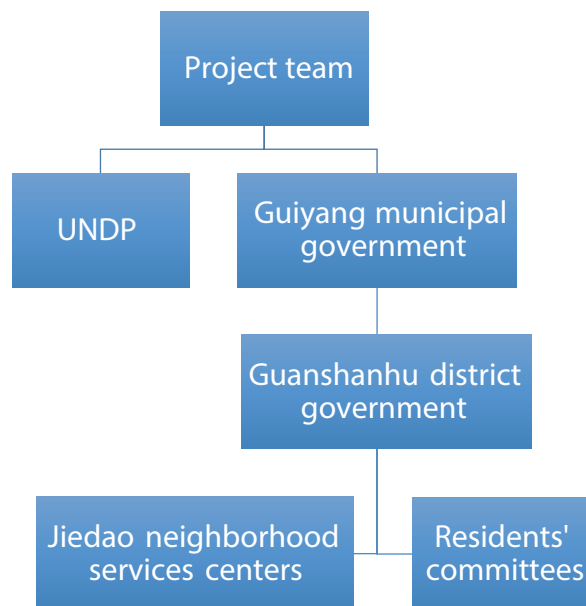


Figure 3. Flow chart for community mobilisation in Guiyang

In China, residents' committees are official civil society organisations (CSOs), whose work is subsidised by the government and supervised by the neighbourhood service centre. Members of the committee are residents in the community and elected by the community so usually have a solid network and are trusted in the communities in which they are based. Gaining support from residents' committees is critical to the success of a community-based project. However, residents' committees also tend to be understaffed with many responsibilities. Therefore, the project team also attempted to connect with local NGOs who has professional social workers to support community deliberation. Funding and scheduling issues prevented successful collaboration and instead the team turned toward local colleges for voluntary support from passionate students.

The team recruited 15 volunteers from the Guizhou Business School in August, after the project launched at the end of May. The students were to help the project as facilitators for the community deliberation. As they were inexperienced, training was crucial to ensure smooth implementation.

Before the community deliberation started, the project team organised training for the staff of the residents' committees and the volunteers separately. The training for the staff of the committee took place for 2 hours at the community service centres. For the volunteers, the training was all-day. The project staff introduced UNDP and its mandate, explained the purpose of the project, and the concept of 'smart cities' and social governance, as well as the methodologies to be used during the community deliberations. The team emphasises the participatory nature of the project, and discussed the concepts of social governance and smart cities in a Q&A session. This step prepared the volunteers and neighbourhood committees to disseminate project information, and explain the project to the people in the community. For the volunteers,

the training sessions also gave a chance to rehearse the coming community deliberation, and practice using all the tools that would be used in the community meetings.

The team set a target for project awareness at 70%. To achieve this, an information dissemination strategy identified door-to-door information distribution, community billboards, and a WeChat official account as the main channels for dissemination 'Door-to-door' dissemination was the most reliable method. A well-designed open letter and project brochure written and designed by the project team were distributed to community people one by one. Volunteers encountered difficulties talking to community people due to lack of trust. Therefore, the staff of the residents' committee were the main force for information dissemination. The team normally visited every household during the daytime, and revisited some of the households in the night where the members were out for work.

For each community, information dissemination took around one week. The open letter and project brochures were disseminated to all community residents. The team went to each community one week before the deliberation started. This time scale gave enough time for the information dissemination team to contact the targeted number of people. In case people were not home during the first visit – normally in the daytime, the team would revisit those households at night after dinnertime to ensure the information was delivered. It was also close enough to the deliberations to generate interest and ensure people would remember they were taking place. Staff from the residents' committee contacted every household again by telephone or text message one day before the deliberation as a reminder. In most of the communities, the residents' committee also called people the morning of deliberation if people had not arrived 10 minutes before the schedule time to begin. The residents' committee also made a particular effort to meet with and invite disabled people to join the deliberation.



Deliberations in Bishuiyuntian community, Bihai neighbourhood

Box 3. International Best Practices: Community mobilisation

Box 3.1 Sarva Shiksha Abhiyan India

The Sarva Shiksha Abhiyan (SSA) is a national education programme instituted by the Indian Government to provide elementary education to all children in the 6 to 14 age group while bridging social, regional and gender gaps.⁵⁶ Community mobilisation is a critical feature of the programme to ensure community ownership and management of the school system which also relies on decentralised decision making.⁵⁷ Initiatives have been launched by the government at various times throughout the programme to engage community-level participation in equity issues, such as introducing barefoot counsellors to link schools and communities in ensuring enrolment and regular attendance and training of community leaders to manage school administration and grants to improve school infrastructure. The programme also developed indicators for measuring the quality of education through a multistakeholder process. India has recently adopted the Right to Education Act which enshrines many of the principles of the SSA programme in law. Much work still needs to be done on ensuring effective implementation. A study done by Oxfam cites multiple effective local efforts often implemented by NGOs that could be drawn on as effective models for national efforts. For example, the Samajshala Model implemented in an extremely poor tribal area in Maharashtra State, has strengthened the relationship between 20 government schools and the communities they serve resulting in 100% enrolment of children (the communities voted to fine any families not sending their children to school) and repaired and improved facilities as well as innovative and enjoyable curricula relevant to the children's lives which has contributed to improved school performance.⁵⁸ What ties all the models together is the importance of community engagement in education, not only increasing parents' voice, but also ensuring that training means that local communities have the capacity to contribute to effective education reform.

Box 3.2 Disaster Recovery Florida Gulf Coast, U.S.A.

The 2010 Deepwater Horizon oil spill was the worst man-made disaster for U.S. Gulf coast communities in memory. Residents and community resource organisations (CROs) in the Florida Gulf coast responded quickly after the disaster, using existing volunteer programs to address social, economic, and environmental issues after the disaster.⁵⁹ Volunteers were trained and then helped with a range of needs such as information-sharing, informal counselling and beach clean-up. The volunteer organisations also organised surveys to gauge the needs of communities. Some of these addressed basic physical requirements, but some CROs in trying to understand what their communities were going through, extended their work and developed informal research surveys that also addressed psychological needs in a post-disaster situation.⁶⁰ Some organisations were already physically present in the community and combined survey work with their other work of information dissemination and beach clean-up. Others

56. Ibomcha, Sharma (2013). *Universalization of Elementary Education under Sarva Shiksha Abhiyan in Manipur*. *Universalization of Elementary Education, Voice of Research*, 1(4): 14-17.

57. See the Ministry of Human Resource's portal website here: <http://ssa.nic.in/>. In addition, many Indian states host their own website on the local iteration of the programme.

58. Kapoor, Richa (2010). *Essential Services: Community-based Management for Right to Education*. *People as Changemakers*, Oxfam India working papers series.

59. Lindsey, Angela; Kumaran, Muthusami (2016). *Coastal Community Mobilization in the Aftermath of Man-made Disasters: a Case Study of Florida Gulf Coast Community Responses after the BP Deepwater Horizon Oil Spill in the USA*. *World Environment and Island Studies*, 1(6): 35-42.

60. Morris, Glenn; Grattan, Lynn; Mayer, Brian; Blackburn, Jason (2013). *Psychological Responses and Resilience of People and Communities Impacted by The Deepwater Horizon Oil Spill*. *Transactions of the American Clinical and Climatological Association*, 124: 191-201.

used community events and fairs to deepen communication with community residents.⁶¹ The information gathered enabled the CROs to develop or tailor existing programmes more effectively and improve their communication efforts. Some looked at how to strengthen feedback mechanisms from stakeholders. More effective communications helped mobilise community members in recovery efforts and service access and likely supported faster recovery along the Coast.

Box 3.3 Sanitation Infrastructure Maina Village, Kenya

In 1985, the Danida Sewage House Connection Project began a project to set up a sewer line, plot connections, onsite sanitation, low-cost roads, storm drains and a community-based solid waste collection system in Maina, Kenya. Previously, the village had no infrastructure or services.⁶² However, the project had been delayed due to disagreements between the project and the municipality about the plan and because there was no community involvement in project planning leading to concern and resistance to planned activities. After a midterm review in 1989, the NGO Kenya Water for Health (KWAHO) was recruited to carry out community mobilisation activities to help improve implementation. KWAHO was charged with identifying the role and responsibilities of the community in project implementation and management, facilitating community mobilisation, helping with physical implementation and building a community organisation that would ensure continued use of the infrastructure after the implementing partners exited the community. KWAHO held meetings with the community which provided information about the project's goals and the residents' role in project implementation and liaised between the project team, steering and site committees and community members. KWAHO built trust through health and financing activities improving the community's standard of living.⁶³ It engaged villagers in village cleaning activities while providing education on the importance of a clean environment. Progress in project implementation improved substantially as reflected in a second review in 1991. Community mobilisation, although not initially planned, played an important role in ensuring successful implementation of the project and it is standard practice now for village infrastructure projects to include community mobilisation as part of the project plan.

3.3 Community and multi-stakeholder deliberation

3.3.1 What is community and multi-stakeholder deliberation?

Community and multi-stakeholder deliberation is based on the concept of deliberative democracy, in which consensus building is central to decision-making. It is a collective and collaborative public effort to examine an issue from different points of view prior to taking a decision. Deliberative processes strengthen policy design by building recognition of common values, shared commitment and emerging issues, and by providing a comprehensive understanding of causal relationships.⁶⁴

61. National Research Council of the National Academies (2011). *Building Community Disaster Resilience through Private–Public Collaboration*. Washington, D.C.

62. Kariuki, M.; Kinuthia, C.; Kunguru, J. (1994). *Community Mobilization in Sanitation Projects: a Case Study of Maina Village*. Regional Water and Sanitation Group Eastern and Southern Africa: 46(1).

63. Anschütz, Justine (1996). *Community-based Solid Waste Management and Water Supply Projects: Problems and Solutions Compared a Survey of the Literature*. Urban Waste Expertise Programme, Netherlands.

64. Swanson, Darren (2011). *Seven Tools for Creating Adaptive Policies*. *Technological Forecasting and Social Change* 77.6: 924-939.

Deliberative democracy is compatible with both representative democracy and direct democracy. Some practitioners and theorists use the term to encompass representative bodies whose members authentically deliberate on legislation without unequal distributions of power, while others use the term exclusively to refer to decision-making directly by ordinary citizens, as in direct democracy. Deliberative democracy differs from traditional democratic theory in that authentic deliberation, not only voting, is the primary source of legitimacy.

3.3.2 Why is community and multi-stakeholder deliberation important?

The goal of community and multi-stakeholder deliberation is to build consensus within communities and different interest groups or stakeholders for resource distribution. The roots of deliberation can be traced back to Aristotle and his notion of politics; however, Jürgen Habermas's work on communicative rationality and the public sphere is often identified as a major work in this area.⁶⁵

From a practical perspective, deliberation offers legitimacy to policies and paves the way for policy enforcement. Through consensus building, potential conflicts that might occur during enforcement are minimised, which ensures smooth implementation. From a development perspective, community deliberation specifically empowers the people affected to be involved in decision making. It also builds solidarity among lay people for further negotiation with powerful groups.

Tools for community deliberation

There are many tools for community deliberation. Here are some of practical tools that can be adapted and used in many situations that require deliberation.

Appreciative Inquiry is a change method that encourages stakeholders to explore the best of the past and present in their organisations and communities. It was developed as a way to counteract the idea of 'problem-solving' by focusing on what is positive in any human system. AI believes that the kinds of questions and conversations people have, and the kinds of stories people tell, will impact and change social systems.

www.appreciativeinquiry.case.edu

A Charrette is a collaborative design methodology that uses input from all stakeholders (the developer, relevant government agencies, and the community) to build consensus usually through intensive multi-day meetings. A "charrette team" of experts uses stakeholder input in a continual "feedback loop" to prepare and negotiate a plan for development with the goal of reaching consensus among stakeholders. Charrettes, which combine modern design studios and town meetings, help to create meaningful master plans.

www.charretteinstitute.org

Consensus Conferences typically involves a group of citizens with varied backgrounds who meet to discuss issues of a scientific or technical nature. The conference has two stages: first a group of ordinary citizens who are demographically representative of the community at large meet with experts to discuss the issue at hand and build consensus.

65. Habermas, Jurgen; McCarthy, Thomas (1985). *The Theory of Communicative Action*. Beacon press.

In the second stage, the citizen panel presents their observations and recommendations to a larger group of policy-makers, experts, media and the public.

www.ncdd.org/rc/item/1492

Deliberative Polling combines deliberation in small group discussions with scientific random sampling to provide public consultation for public policy and for electoral issues. Members of a random sample are polled on a particular issue of public policy to establish a baseline and then some members are invited to gather at a single place to discuss the issues after they have examined balanced briefing materials. Trained moderators facilitate small group discussion where participants develop questions which they then put to competing experts and political leaders. Finally, they are polled again to see if and how opinions have changed after they have had a chance to become better informed on the issue.

<http://cdd.stanford.edu>

Future Search is a planning method often used by large, diverse groups to address complex issues, particularly ones where conflict or uncertainty is high. It takes place over a 3 day period. On the first day, people create timelines and mind maps and share stories in small groups to examine past events and current trends. The second day involves presentations from small groups on how they are dealing with current trends and what they wish for the future, then developing ideal future scenarios and finding common ground. The final day involves confirming common ground and developing action plans.

www.futuresearch.net

Intergroup Dialogues are face-to-face meetings of people from at least two different social identity groups. They are designed to create an open and inclusive space where participants can develop a deeper understanding of diversity and justice issues through participation in experiential activities, individual and small group storytelling, and dialogues.

www.igr.umich.edu

Open Space Technology is a meeting or event format that allows for self-organising and emerging themes. The agenda of the meeting is set by the participants at the beginning of the meeting, which is held in a circle. As discussion proceeds, participants can post issues on a bulletin board, which then become topics for breakout sessions. The approach is designed to create whole systems change and inspire creativity and leadership among participants.

www.openspaceworld.org

Study Circles bring people together in multiple meetings to discuss issues, build understanding and explore solutions. Multiple methods may be used for study circles, although generally they do involve background reading and a member of the group acting as facilitator to keep discussion moving. They aim for social, political, and policy change.

www.everyday-democracy.org

Sustained Dialogue is a process that focuses on exploring relationships in the belief that these are essential to democratic political and economic practice. It facilitates long-term dialogue through a series of meetings to build relationships among members of groups to effectively deal with practical problems. It involves 5 stages: identifying who participates, mapping and naming challenging relationships, exploring systems and dynamics of those relationships, building scenarios, and identifying actions.

www.sustaineddialogue.org

3.3.3 What is needed for community deliberation?

The goal of community deliberation is to build consensus within communities. It requires information symmetry, diversity of participants, and productive and efficient discussion. Different forms of community deliberation require different tools. In general, the representativeness of participants, amicable venues, and good timing are universal.

Representativeness: it may not be necessary to have all community members involved in deliberation, especially when the population is large. However, the representativeness of participation is crucial. There should be diversity with regards to age, gender, ethnicity, class, religion and physical ability.

Venue (weather, atmosphere, etc.): To ensure people's participation, particularly ones that involve all-day discussions, environment is crucial. It can attract people, and also push people away. Environmental factors include out-door or indoor space, weather, etc. Outdoor space is often more inviting and encouraging than indoor space. It is more visible and accessible. Outdoor discussions can attract more and a wider variety of people. However, outdoor space is subject to weather, which can be discouraging. In winter it might be too cold, in summer it might be too hot. A canopy can be practical for outdoor discussion. Appropriate seating and availability of washrooms, water, food etc. are also considerations.

Timing: Timing is another crucial element for attracting people to participate. There are two dimensions for timing, namely weather and availability. Weather matters especially when deliberation is taking place outdoors. It is preferable to have discussion during mild weather, such as spring, or autumn, which depend on the geographical context in different locations. In terms of availability, working hours and holidays need to be taken into consideration. Groups may consider separating discussions into several Saturdays or several Sundays, when more people can come.

3.3.4 Community deliberation for the Smart Cities and Social Governance Research Collaboration

Community deliberation

The smart cities and social governance index research collaboration carried out community deliberation on the weekends of September and October, 2016, when the weather was mild enough in Guiyang to hold outdoor meetings. The approach used for the deliberations combined Appreciative Inquiry and Study Circles, as these methodologies encourage mutual learning for policy change.

Efforts were made to ensure that all community people received information about the deliberation sessions and were all welcomed to participate. Disabled people and young people who were usually inactive in community activities were targeted invitees to ensure representativeness.

A project brochure was designed to appeal to young people. It utilised cartoon figures, and informal language. The residents' committees made sure to contact young residents and disabled residents in the targeted calls they made one day before the deliberations. On the day of deliberation, staff helped disabled residents to come to the site. Digital tools were also used as a way to involve more young people⁶⁶ and people who were unable to attend the deliberations.



Figure 4. Page from brochure

The project opened online platforms including Yi Broadcasting, Weibo and Wechat official accounts. Volunteers took videos and photographs of the deliberations. Yi Broadcasting broadcasted the whole process online, allowing people to learn how and what their fellow residents discussed. The Weibo account was linked with Yi Broadcasting. It automatically uploaded videos of the live discussion without editing. The Wechat official account posted discussion outcomes and allowed people to comment and give additional thoughts around the issues discussed. Yi Broadcasting requires people to register an account to join the live broadcasting. Quick registration through a Weibo account is available. For Weibo recordings, people can view the proceedings without registration.⁶⁷

The first three deliberations were held outdoors. The last two were moved indoor due to rain and falling temperatures. The deliberations had around 60-80 participants from each community. To produce inclusive and high quality outcomes, people were divided into several groups, with 8 to 10 people in each.

66. According to CNNIC's report on the Behaviour of Chinese Social Media Application Users (2015), 82.5% social media users are below 40 years old.

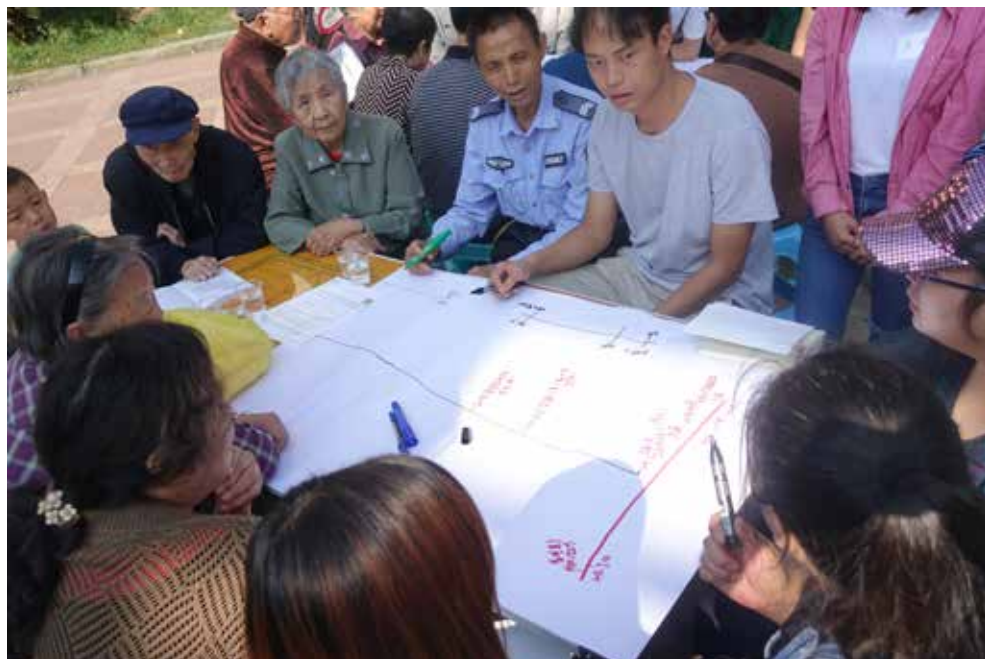
67. According to CNNIC's report on the Behaviour of Chinese Social Media Application Users (2015), 43.5% of social media users are Weibo users.

To foster the deliberation, four deliberation tools were adopted. These are the 'river of life', access mapping, brainstorming for opportunities and problems, and brainstorming for solutions.⁶⁸ As the purpose of the project is basically to develop a 'strategic plan'⁶⁹ for the communities, it is important to start with a good understanding of the history and current status of the everyday lives of the members of those communities. River of life and access mapping are tools that can provide that insight. The analysis of opportunities and problems, and a collective approach to developing solutions, can help the communities consider many options, understand the relationship between a variety of issues and form a well-considered plan that takes into account many perspectives.

The four tools have different roles and are aligned as four steps.

Tool: River of Life

The river of life, also called 'map the journey', is the first step in the deliberations. This activity maps out a narrative of the community visually. It aims to bring the participants' memories of their community together to build a comprehensive picture of the history of their own community and city. It helps community people to understand how the development of their area evolved and build rapport with other participants and facilitators. The exercise requires community people to mark down on a large sheet of paper major events that have occurred in their communities, pleasant or not. The events may include when buildings were built, when bus service started, theft, fire, community celebrations, etc. During the community deliberations, the project team leader explained the exercise. Subsequently, a volunteer was assigned to each group who also helped with questions. Each group chose a member to write down the timeline. In some cases, if no-one in the group was willing to be responsible for writing down the timeline (e.g. in groups with mostly elderly people who were not confident of their literacy skills), the volunteer would assist. After each group was finished, they shared the results with the larger group and created a common timeline.



Deliberations in Jincuiwan Community, Bihai Neighbourhood - River of Life

68. In cases of deliberation for other objectives, the listed tools in the section above could be referenced and adopted for specific contexts.

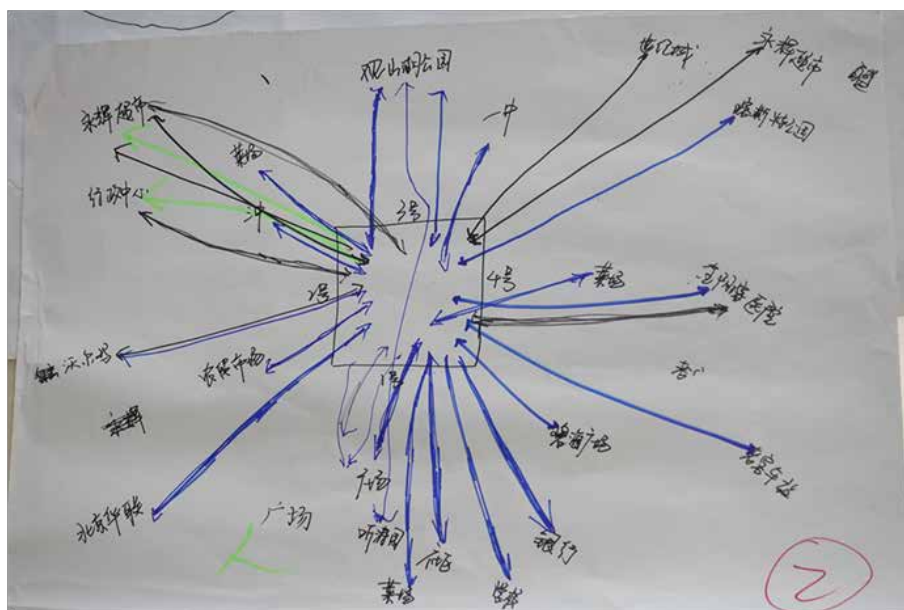
69. A strategic plan is a plan that sets out visions for the development of a city, guiding development actions.

Tool: Access Mapping

Access mapping was used as the second step in the deliberations. It aims to help community people learn about each other's lives, and understand their common needs through visualising their everyday activities. In this exercise, each group is given a prepared map of Guiyang City and a blank A1 paper. Pens of different colours and sizes were distributed to different groups. Different colours symbolise different means of transport. The size indicates frequency of the specific activities. Community people first locate their communities on the city map, as well as their workplace, shopping destinations, etc. Pens of different colours and size connect the dots they marked on the map. Blank paper were prepared for people to map out their activities near their communities, which are then mapped out on a small scale map. The maps prepared by the smaller groups are then shared with the larger group and posted on a wall for the members to review. This also helps the project team get a better idea of the patterns of life in the community.



Deliberations in Jincuiwan Community, Bihai Neighbourhood – Access Mapping



Deliberations in Songjingge Community, Bihai Neighbourhood - Access Mapping

Tool: Brainstorming for Opportunities and Problems

Brainstorming for opportunities and problems is the third step. After mapping community histories and everyday activities, community residents as well as the project team, volunteers and the neighbourhood committees all had a good understanding of the community and its neighbours.

Rapport had been built and issues in the community and city could then be discussed. Positive events flagged by community members could also become opportunities for improvement. This exercise helps people to extract common concerns, such as health care packages, transportation efficiency (congestion, pedestrian safety), schooling for children under 12, and the convenience of accessing everyday goods. Issues were mapped onto the city using different colours.



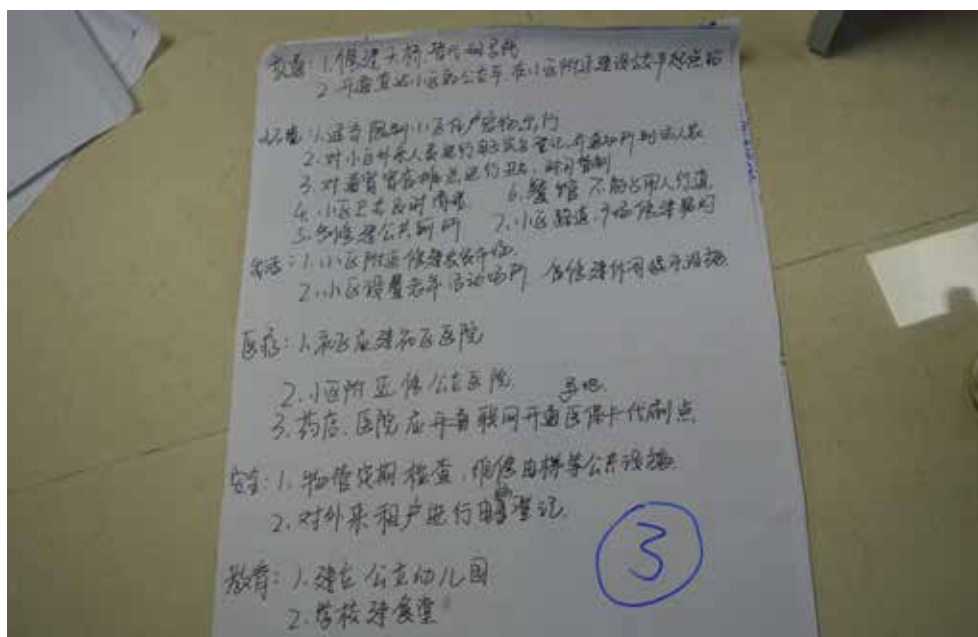
Deliberations in Meidilincheng Community, Huizhan Nieghbourhood – Brainstorming for Opportunities (in red) and Problems (in blue)

Tool: Brainstorming for Solutions

Brainstorming for solutions is the fourth step. In a radiating style, solutions often could be added as another layer extended from the opportunities and problems.

The purpose was to help community people develop a path forward which empowers them to negotiate with other development stakeholders. It also offers a chance for people to learn more about decision-making processes. It helps community members understand better the challenges to meeting everyone's needs, the negotiations and trade-offs that need to occur and the impacts that decision's in one area may have on others, requiring the need to look at the community in a holistic way, and effectively adopt a systems approach to deliberation.⁷⁰

70. Seymoar, Nola-Kate; Anderson, Samantha (2009). *Next-generation Communities*. Available from <http://sustainablecities.net/wp-content/uploads/2015/10/next-generation-communities.pdf>



Deliberations in Huizhancheng A, Huizhan Neighbourhood -- Brainstorming for Solutions

Multi-stakeholder deliberation

After all community deliberations took place, the project held a roundtable in December, that brought together community representatives, different governmental departments, academics, private companies, etc. The Guiyang Municipal Government coordinated the participation of different government departments including bureaus of education, environment, food and drug safety, urban planning, transportation, healthcare, etc. Each department dispatched one high-level official to participate in the discussion. 30 participants from different sectors joined the deliberation.

Intergroup Dialogue was the tool used for the multi-stakeholder deliberation, in which people from different sectors were purposefully mixed. All participants were separated into five groups sitting around five tables. There are several objectives for this measure. The first is to encourage full discussion with inputs from different sectors. The second is to break down the hierarchical culture, and ensure that representatives from communities, academia and the private sector could directly talk to the governmental representatives, and eventually build consensus and develop an indicator system with cross-sector support. For example, community representatives sat next to a director of the bureau of urban planning, and an academic. Company managers could freely exchange ideas with government officials next to them. The outcomes of the community deliberation were presented to the roundtable for discussion. The River of Life Maps, the Access Maps, and brainstorming session notes were posted on the walls of the room where the roundtable was taking place.

The purpose of the Roundtable was a) to create a dialogue opportunity between the communities and other development stakeholders; and, b) to bridge the gap between community concerns, governmental administrative restrictions, and existing data capacity. Expert input is also important because it brings important indicators for social governance which might be missing from everyday needs-based indicators. For example, those indicators suggested by the Roundtable include pollution in water, air, soil, etc., the responsiveness of the food safety monitoring system, the role of NGOs and the media,

etc. The Roundtable is also important in gaining government support so that the project will be sustainable after the project team exits the communities.



Multi-stakeholder roundtable discussion

Box 4. International Best Practices: Community and multi-stakeholder deliberation

Box 4.1 Dialogue with the City Perth, Australia

Facing unsustainable growth and urban sprawl, the Ministry for Planning and Infrastructure of Western Australia, decided to launch a process, Dialogue with the City, for its capital, Perth in 2003. Building on 2 years of work on making Perth more sustainable, the Dialogue was intended to engage the residents of Perth in creating a plan to make Perth the world's most liveable city by 2030. At the time, Dialogue with the City became the largest deliberative forum in the southern hemisphere and a case study in deliberative democracy. The process began with information dissemination through a survey mailed to 8,000 households, a television programme, a website, newspaper and radio, stories and on air through radio, student contests, and connecting with a wide range of interest groups. This culminated in a large deliberative forum with 1100 participants to determine the agenda for the deliberation, and then a series of smaller meetings over the next eight months with stakeholders from community, industry and government, that created the community planning strategy.⁷¹

Informed dialogue was a feature of the deliberation. Nine issues papers prepared by experts engaged by the WA Planning Commission were disseminated via the internet, through feature articles in newspapers, and through background briefing packs sent to all participants prior to the forum. Community feedback was also solicited prior to the forum. A television programme that presented various scenarios for Perth's future welcomed on-line feedback from viewers prior to the forum. A survey was mailed to 8,000 households.

71. Available at <http://participedia.net/en/cases/dialogue-city>

The forum started with speeches on successful sustainability plans elsewhere in the world highlighting the choices that needed to be made for a sustainable city. Participants then engaged in small-group dialogue with a trained facilitator and scribe to fairly record the in-depth discussion. Both consensus views and strongly-held minority views were recorded. Groups were deliberately mixed to ensure that a wide variety of views could be heard. Over 250 volunteers from the private sector, public sector and non-government organisations supported the deliberation. Dialogue with the City is considered a good case study of deliberative democracy as it adhered to the principles of inclusion, deliberation and influence and provided legitimacy and public support for the government to move forward with sustainability planning in spite of opposition from vested interests. It created a sense of 'ownership' of the strategy and a platform for active engagement in 'citizenship' of Perth.⁷²

Box 4.2 National Issues Forums U.S.A.

The Kettering Foundation in Dayton, Ohio, created the National Issues Forums (NIF) in 1981 to engage people in public decision making through deliberative forums. The NIF now has a presence in over 40 states in the United States usually based in a higher education institution or non-profit organisation. Forums are held on controversial topics so that citizens can become more informed, contribute to the discussion and look for solutions. Forums are sponsored by a wide range of groups such as high schools, universities, public libraries, and community organisations. On-line discussions are held as well.

To support the Forums, the NIF and its network produce discussion guides/issue books that provide a description of a particular public issue and three or four possible approaches for addressing that issue.⁷³ Over seventy-five issue books have been produced. Recent guides include, for example, public safety, end of life, and obesity.⁷⁴ Issue books have been used in universities and high schools for course materials and to spur discussion.

Participants are expected to read the discussion guide prior to the Forum. During the Forum, each individual is given an opportunity to express an opinion and to hear the opinions of others. A trained moderator facilitates discussion so that the group can arrive at consensus for action even if participants do not necessarily agree with each other on all points. Critical to the Forum approach is that people work through differences and come to understand each other's perspectives and values.

Box 4.3 Northern Region Sustainable Water Strategy Victoria, Australia

The Office of Water of the Department of Sustainability and Environment (DSE) of the Victoria State Government in Australia launched a community engagement and consultation process to assist in developing the Northern Region Sustainable Water Strategy (NR SWS) in 2008-9⁷⁵ A key aspect of the process was to improve people's understanding of water issues, long-term impacts and how to address them. The NR SWS used representative working groups and local forums to engage key stakeholders and seek input throughout the process. Diverse opinions

72. Hartz-Karp, Janette (2005). *A Case Study in Deliberative Democracy: Dialogue with the City*. *Journal of Public Deliberation*: 1.

73. Daugherty, Renée A.; Williams, Sue E. (2007). *Applications of Public Deliberation: Themes Emerging from Twelve Personal Experiences Emanating from National Issues Forums Training*. *Journal of Public Deliberation*: 3(1).

74. Available from <https://www.nifi.org/>

75. Beckingsale, David; Hind, Julie (2010). *Towards Deliberation and Dialectic: The Community Engagement Process for the Northern Region Sustainable Water Strategy*. Northern Region Sustainable Water Strategy.

were actively sought in a variety of ways. The Consultative Committee and the working groups were drawn from a broad range of stakeholder groups. These groups identified issues, explored scenarios and solutions and helped develop aspects of the strategy.

Box 4.4 Great Lakes Canada and U.S.A.

Within the Great Lakes region of the United States and Canada, public deliberation across national borders has been in place for more than two decades through numerous forums. A transnational network and multilevel participatory governance system has been developed based upon the policy frameworks provided by the Boundary Waters Treaty, the Water Quality Agreement and the Air Quality Agreement. The parties have agreed to refer in their common environmental policymaking to democratic principles such as cooperation, publicity, public participation, transparency, accountability, and dialogic conflict resolution with regard to the Great Lakes and other trans-boundary water bodies. Three main types of public participation in the Great Lakes region have been identified in the academic literature: declamatory, discursive and consultative-intermediary procedures.⁷⁶ Discursive procedures are identified as problem-oriented meetings, workshops, roundtables, focus groups, and consultations on specific issues that involve affected and interested citizens, stakeholders and external experts. These procedures are characterised by dialogue and debate, and include both technical analysis of the issues and consideration of public acceptability of solutions. Consultative-intermediary procedures refer to the establishment of permanent public advisory bodies which include environmental, tribal, industrial, business, health, and academic stakeholders on specific “Areas of Concern” (e.g. invasive species in the Great Lakes, water pollution, cross-border trade, etc.) Deliberative governance is particularly present in environmental policymaking as a way of addressing complex issues which require considerable knowledge of the multiple systems, environmental, economic, political and social which impact environmental policy-making in the region.

3.4 Feedback to communities

3.4.1 What is feedback to communities?

Feedback is the return of information. It can be about previous requests, consultations, results of activities, etc. Feedback to communities is the responsibility of the project team to ensure that communities receive information on the progress or results of decisions that have been taken in response to community residents’ contributions, proposals or requests.

3.4.2 Why is feedback to communities important?

Feedback to communities is a crucial step in a process that uses community participation. If community mobilisation builds trust between communities and practitioners, feedback to communities builds trust and faith between participants and the method,

76. Carr, Gemma (2015). *Stakeholder and Public Participation in River Basin Management, an Introduction*. *Wiley Interdisciplinary Reviews: Water*: 2(4): 393-405.

and public participation as a concept itself. People are encouraged to further participate in public affairs if their participation and contribution is valued. Failure to give feedback discourages people from future participation, and destroy the trust between them and similar activities as well as between them and the organisations that mobilised their initial participation.

The purpose of community participation is to empower community people to have more voice in the policy decisions that affect their lives and balance power relations. Building up confidence in public participation is especially crucial in societies where public participation and deliberation is still not fully accepted. Only when people believe that participation is worth their time and effort will broader and deeper participation occur.

3.4.3 What are the tools for feedback?

Feedback is in essence a process of communication. Therefore, the tools for feedback can be any means for communication. They can be the same as the tools used for information dissemination during community mobilisation. But certain differences are worth noting.

As information dissemination has raised awareness of the project among the residents, it is not necessary to give door-to-door feedback which would be time consuming and costly. Billboards, text messages or digital tools such as project WeChat official accounts in the Chinese context could be good channels. For the results of community meetings/deliberation/etc., the results need to be published in a timely manner residents have time to receive the information and give further feedback. In this case, radio or TV may not be a good option, unless the feedback is broadcasted repeatedly over a certain time period. In some cases, another round of community meetings are necessary for full communication with the people involved.

3.4.4 Feedback to communities in the Smart Cities and Social Governance Research Collaboration

The project feedback to communities consists of two outcomes. The first is the indicator system, and the second is the values of measurable indicators.

Indicator system

The final indicator system together with the community deliberation outcomes is being disseminated through the residents' committee in the form of printed letters and posters, as well as through the WeChat official account. The purpose of putting the two tables together is to help the community understand the evolution of the indicator system, which is set up to measure actions taken to address community concerns. As well, as a quick and easy way to solicit opinions from the communities, the project team has opened a mobile hotline to answer inquiries and gather suggestions.

Values of measurable indicators

The indicator system itself, at the current stage of smart city infrastructure development in China, plays a bigger role as a vision rather than a practical tool, especially in less developed areas where data collection infrastructure is still rather weak. However, some of the indicators are able to be measured by the available technology. Therefore, the feedback also includes reports to communities on the performance of measurable

indicators. On the one hand, it helps the communities to understand the use of the indicator system and see its value; on the other, it helps increase transparency for residents on the development (for good or bad) in their neighbourhoods. Transparency not only holds government accountable, but also demonstrates to communities where they also may take responsibility for action for change.

Box 5. International Best Practices: Feedback from communities

Box 5.1 Maternal, Newborn and Child Healthcare Programme Myanmar

As the largest country in mainland south-east Asia, Myanmar is one of the most disaster prone countries in the Asia Pacific region.⁷⁷ To help address this situation the Myanmar Red Cross Society (MRCS) has been supporting a five-year community-based health development programme, 'Maternal, Newborn and Child Healthcare' (MNCH), financially and technically since 2013. The MNCH programme as a whole has a feedback and complaints mechanism in place, allowing community members and other stakeholders to provide feedback to MRCS via two channels:⁷⁸

I. Face-to-face from community volunteers and village committees to the Community Mobilisers (CMs): CMs train community volunteers and village committees in the importance of actively soliciting feedback. CMs systematically gather feedback from the village committees every time they are in each village and document it in their monthly report to the central programme office for their respective areas. The village committees actively seek feedback in monthly community meetings and pass this on to the CM.

II. Suggestion boxes: These are already in place in every village and are checked by CMs monthly. CMs ask village committees to encourage the community to use them. The programme informs the community of their right to complain and provide feedback, and how the feedback will be dealt with through volunteers when they are conducting other activities at community meetings and from posters and flyers distributed to the community. Feedback is also solicited through a mid-term review.

Box 5.2 Parramore Kids Zone USA

Parramore is a low-income neighbourhood with significant social issues in Orlando, Florida. In 2003, the City of Orlando began allocating significant resources to address housing, public safety, quality-of-life and business-development issues. One of the successful programmes to come out of this effort was the Parramore Kids Zone (PKZ), a neighbourhood-based education collaborative model. PKZ uses community feedback and survey results to design programming.⁷⁹ The collaborative constantly holds neighborhood meetings to gather feedback on its services and marketing strategies, disseminate information, and plan activities. PKZ provides free child care, transportation and food to attract participants and minimise barriers for participation. The programme also

77. Lebel, Louis; Hoanh, Chu Thai; Krittasudthacheewa, Chayanis; Rajesh, Daniel (2014). *Climate Risks, Regional Integration, and Sustainability in the Mekong Region*. Strategic Information and Research Development Centre, Malaysia.

78. Myanmar Red Cross Society (2016). *Integrating Community Engagement and Accountability into Disaster Risk Reduction Activities of the Maternal, Newborn and Child Healthcare Programme in Rural Myanmar*.

79. The Bridgespan Group. *Needle-moving Community Collaborative, Case study: Parramore*. Available from <https://www.bridgespan.org/bridgespan/Images/articles/needle-moving-community-collaboratives/profiles/community-collaboratives-case-study-parramore.pdf>

enhances its impact through door-to-door and street outreach. Engagement of community members means that there is widespread awareness about the services offered and that the community feels 'ownership' of the programme'. PKZ also uses culturally relevant marketing techniques such as "wrapping" PKZ vans in designs created by the neighborhood youth, collaborating with youth to organise neighborhood events; and distributing PKZ T-shirts and other giveaways.

3.5 Learning — successes and lessons

Successes

The Guiyang Smart Cities and Social Governance Research Collaboration has resulted in effective discussion outcomes that have strengthened awareness and understanding of community needs and priorities improving communication and social governance within communities and local government. Its success is largely attributed to successful project mobilisation, the efforts to engage people in discussion, and the training of field volunteers.

Setting the stage: Government support. Setting the stage for project implementation was approached with a clear understanding of China's cultural and political context and the need to begin with a top-down approach, engaging government in mobilising resources and support. Trust is easier to build if information is initially disseminated through government. Gaining government support paved way for project implementation. Under the coordination of the Guiyang Municipal Government, information was passed through the district government to the neighbourhood service centres and eventually to the resident committees. As well, the support of the municipal government also helped to quickly mobilise and coordinate different governmental departments in the project's multi-stakeholder deliberations. The project team, however, did not solely rely on top-level government support, but also invested time and effort in explaining the purpose of the project to all levels of municipal government and communities involved in the project.

Community mobilisation: Everyday relevance. After government support was gained for the project, the next stage was to connect the project to people's everyday lives. To ensure a high levels of engagement, projects that require community participation need strong relevance to people's everyday lives. In the mobilisation materials such as the project open letter and brochures, the background of the project and the benefits to people in the community were clearly outlined. The project emphasised the 'smart application'⁸⁰ which will use the indicators developed through community consultations to benefit the community. People were attracted by the understanding that participation could directly impact their everyday lives.

Incentives: Time, gifts and food. Pragmatic tools also played significant roles in involving people. Deliberation lasted for two days in most of the communities. Keeping participants engaged from the beginning to the end was a challenge. After the first half day of discussions, the meeting schedule was revised based on feedback from the community to shorten the deliberations. The consensus on the new time schedule helped increase the percentage of re-participation. As well, the project introduced an incentive plan. Participants who completed the whole deliberation were given a

80. Smart application refers to ICT infrastructure, such as sensors for data collection, electronic device-based digital tools for services (e.g. an appointment system for hospitals) or community services such as road lights maintenance, etc.

small gift at the end of the deliberation, as well as invited to the free lunch offered by the project. It was made clear in the beginning that only participants who had fully participated in all the sessions would be rewarded. This tool in fact had a very significant impact on the whole process.

Training: Volunteer support. The training of volunteers was critical to the project success. After training, college students with no community service experience were able to talk to community people with diverse backgrounds and age ranges. The volunteers practiced using clear language to explain the project background and purpose and to treat community members with respect. They were prepared to guide the discussion and keep it on track. In the beginning of the deliberations, it was common for community people to misunderstand the objective of each steps of the discussion, but want to immediately air complaints. The trained volunteers were able to skilfully keep the deliberations on the right track and ensure effective outcomes for each stage by the end of the scheduled time. Sharing the results of each stage of discussions also helped clarify to the community participants the value of the whole process.

Intergroup roundtable: Mutual understanding. The multi-stakeholder roundtable which adopted an intergroup discussion methodology was a remarkable success. During the discussion, representatives from government, private companies specialising in smart cities development, communities and academia, as well as data experts expressed opinions from very different perspectives. The community representatives' focus is still on everyday needs. Government representatives are concerned about whether the measurements are practical to address within the current administrative system. Academic researchers are interested in the methodology and concept behind the development of the indicators, in particular the concept of 'social governance'. Data experts have specific concerns over the methods for calculation and the availability and sources of data. The private sector is largely concerned with the enabling environment for the data industry and commercial service support. The roundtable mixed representatives from different sectors. Every participant was exposed to the different perspectives through intensive discussion. At the end of the discussion, consensus was reached on two points: a) the indicator system should take 'communities'⁸¹ as the basic unit for measurement; b) social services should be the core of the evaluation.

Feedback: Confidence in future participation. Good feedback to communities is helping to ensure the confidence of communities in future participation. As the community members also witnessed the birth of the indicator system, from raw discussion outcomes to a refined indicator system with the source of each indicator identified, the participants felt that this was part of their own achievements. Some of the participants came to the project team to express their excitement after deliberation. Some participants also continue to call the project team or write letters to give opinions. This project appears to have encouraged community people to further participate in public activities, and has also encouraged the residents' committees and service centres to cultivate a bottom-up participatory culture in their communities and the city.

81. 'Community' is defined by the jurisdiction of each residents' committee, which is assigned by the neighbourhood service centres.

Lessons learned

However, there were also challenges that the project was less successful in overcoming.

Representativeness. One of the significant challenges was the question of representativeness of participation, which is crucial for participatory deliberation.

Although the project attempted to target young people for information dissemination, participation by young people was low compared to people aged 50 or over. The reasons for lack of participation that were reported to the project team included scheduling conflicts and hectic lives (being either too busy or too tired to participate due to work or other obligations), and low interest in community activities and public affairs. The exception was Meidilincheng Shidai where the number of people under 40 surged, because children's primary education schooling was a major concern for the community, attracting the participation of young parents. This also reflects the impact of the relevance of the discussion to people's everyday life on participation.

Time management. Though the project had prepared the volunteers for facilitating the discussion to keep it on the right track, there were several incidents that delayed the scheduled deliberation plan. In Meidilincheng Shidai, strong resentment about children's schooling meant that participants were largely focused on airing these grievances to the residents' committee. The deliberation was delayed and it was difficult to redirect attention to the deliberation agenda. In Bishuiyuntian, an unplanned division of the group moved part of the discussion into a kindergarten and kept another half in the outdoor space. The team had to shuttle between the two spaces to facilitate the deliberation which negatively impacted the efficiency and strained the capacity of the project team.

Unexpected situations are common in community meetings, and need to be accommodated in the project plan. It is important to incorporate contingency planning in the timeline expectation in project design. If the deliberation is for a complex and large development or policy plan, the project designer needs to prepare for the unexpected in terms of time and budget, in order to ensure quality deliberation outcomes. Pre-meeting research on community conflicts may also help to give insight into what a reasonable timeline might be. The second is the importance of deliberation facilitators. A good facilitator must have a strong understanding of the vision for the deliberation and the tools to be used in the deliberation, be a good time manager, good at managing emotions, and also be able to manage crises, which is possibly the most challenging role, but also one of the keys to the success of the deliberation.

Digital tools to broaden participation. The project attempted to use digital tools to broaden participation. The tools used include a WeChat official account, Yi Broadcasting and Weibo video recordings. It was expected that the digital tools could include people that were unable to be physically present to give their voice by participating online. The digital tools also targeted the participation of young people. By the end of the deliberations in five communities, the WeChat official account had 101 followers. Yi Broadcasting and Weibo had less than 10 followers. Although the project team disseminated the information through the community deliberation sessions and gave detailed information on registration, the results was still not desirable. This may have been due to the intensity of promotion and the efficiency of the digital tools themselves. More attractive and efficient tools may lead to better effects. This field needs more extensive exploration. Broadening participation remains a challenge.

Indicator development. There are also challenges with the development of the indicators. There were many issues raised by the communities and the original listing of items that could potentially be tracked as indicators in the end numbered over 150. The

practicalities of tracking this many items meant that a balance had to be found between responsiveness to the communities, and the capacity of the project to collect data. This issue was also raised in roundtable deliberation where the government representatives were involved. As well, how the indicators could be ‘smart’—reflecting the features of big data -- and measurable, was questioned during the multi-stakeholder roundtable.

To scale down the indicators, the project team categorised and merged the long-list indicators. To reflect the ‘smartness’ of indicators, the project team asked the data experts and government representatives to list existing data platforms and data types during the roundtable. For instance, data available through an existing environment monitoring system and a food security monitoring platform were incorporated into the design of the social governance indicator system. Taking into consideration that the majority of the community concerns are still not measurable, the project preserved the dimensions and set up an ideal and comprehensive matrix, with the expectation that the development of data infrastructure would be guided and developed accordingly.

Conclusion

The importance of community participation in urban governance is widely recognised globally and in China in high-level policy documents such as in Habitat III’s *New Urban Agenda* and China’s *New-type Urbanisation Plan (2014-2020)*. The challenge is to activate those policy documents into real-world practice. This Guide outlines tools and lessons for implementing community participation and using community-based monitoring of local government performance as a way to improve transparency and accountability, inform decision-making and measure progress towards goals.

UNDP China in the Smart Cities and Social Governance Research Collaboration made three ground-breaking contributions in Guiyang. The first was to introduce participatory approaches into policy making through developing an indicator system which has traditionally been an elite-led process. The second was an attempt to overcome the weakness of traditional participatory approaches with the use of digital tools. The third was to cultivate a culture of public participation among urban residents in Guiyang. For the first contribution, the project demonstrated the feasibility of combining bottom-up and top-down approaches for policy making. It was unquestionable a success overall, although there is still room for improvement and flaws to be addressed. For the second contribution, support is still needed. Though the experiment of broadening participation through available digital tools did not generate strong outcomes, the direction is promising. Inter-disciplinary or inter-sector collaboration and more practical efforts will hopefully achieve better effects in the future. For the third contribution, positive signs have emerged during the development of the indicator system. However, a mature culture in which citizens embrace and value participation in public life, long-term and continuous efforts are needed.

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Appendix 1: Results of the brainstorming sessions

Note: issues were common to all communities unless specified

Topic	Problem	Plan
Safety	Economic crime, pyramid sales and fraud The number of pyramid sales is high while crackdown is not enough (sometimes the pyramid sales take place at night after the authorities have searched in the daytime).	Population management. Pyramid salespeople should be blacklisted so the criminals could no longer rent houses The entrance security system should be upgraded to a face recognition system.
	Theft, robbery	Monitoring systems should be improved.
	Among the outsiders, the bad became mixed with the good.	
Housing	Rental system is badly management and the staff are too crowded.	Rental management system
	The maintenance of water and electricity supply is far from satisfactory	The management capacity of the housing services should be enhanced.
Food	Walking distance	Food should be booked online and delivered to the house.
	Food prices are increasing including meat and vegetable	
	Community canteen	Community canteens should be built.
Transportation	There is no bus running from Bihai Community to Guiyang North station or trade and business centre.	The bus coverage should be enhanced.
	The number of No. 29, 47, 48 buses is limited and passengers are crowded. Traffic congestion is frequent. The waiting time for buses sometimes is over half an hour.	The intervals of buses should be lowered and the number of buses should increase.
	Bus card discounts should be enhanced.	Policies should be adjusted by governments and bus enterprises.
	There is serious traffic congestion in the school area near Bihai Community.	Special streets for buses should be built.
	There are not enough information display screens.	Monitoring platforms should be built on WeChat. More information display screens should be built.

	There is no crossing or crossovers at the intersection near Bihai Community. Tunnels or crossovers should be built near Bapima area. Motorbikes and electric bikes are driven on the sidewalk and threaten the safety of pedestrians.	Crossing and crossovers should be built.
	Both sides of Bihai South Road have vehicles parked and the bike lanes are occupied. One side of the street is occupied with cars, which leads to traffic congestion.	Parking management system
	There are too many taxis with no licenses.	
	There is no crossovers and it is not safe to go across the street.	
Education	There are no public kindergartens.	Public kindergartens should be built.
	Tuition fee of existing private kindergartens is high.	
	There is no high schools near Bihai Community.	Ordinary middle schools should be built and the education resources should be shared via internet.
	School charges are not reasonable (e.g. materials fee)	Governments should regulate.
	The education quality of middle schools near the community is low and they are badly managed.	The number of teachers should increase and the management should be strengthened.
	There is no ordinary middle school there. The threshold of key schools is too high.	Governments should promote the building of ordinary middle schools.
	The number of books in the library is too low to meet people's need.	
Environment	Trees are pulled down due to commercial interests.	
	There is serious noise in the community. Sometimes people drive late at night and disturb the residents. Kindergartens are located in the housing estates and the environment is noisy. Loudspeakers of the shops disturb the residents. There is serious noise due to the dancing in the square.	Noise management

	<p>The corridor cleaning is not enough especially on the weekend.</p> <p>The septic tanks are not cleaned up on time and the residents on the first floor are badly impacted.</p> <p>Corridors in the housing estate is poorly cleaned. Usually the garbage is collected less than once a week.</p>	The quality of cleaning services should be enhanced and the environment should be checked on a regular basis
	Dog faeces are not cleaned and the noise disturbs residents. Sometimes the safety of residents is threatened by big dogs.	
	The number of restaurants in the lower floors of the housing estates is high and there is too much smoke and lampblack.	
Health	The fees for medical care is high and insurance cannot be used in other places.	Relevant policies on transferable insurance
	<p>The distance to hospitals is far.</p> <p>It is not convenient to go to the hospital and the number of hospitals with socialized medical care is limited.</p>	
	Hospitals are usually crowded and the queues are long.	Medical services should be booked via online terminals.
	It is too difficult to see the doctor due to the lack of infrastructure.	Smart doctors
	<p>The community hospitals play little role.</p> <p>They have poor medical equipment and the information is not shared.</p>	More medical facilities should be built and the number of doctors should increase.
Gyms & Entertainment	The gym & exercise facilities are not enough. (Existing facilities are broken or not maintained)	The exercise facilities of should be maintained on time.
	<p>Indoor area</p> <p>There is no indoor entertainment area for elders.</p>	Activity area should be built.
	Outdoor area	
Community services	Community committee cannot understand and solve problems on time.	
	The elders are not sufficiently taken care of and relevant facilities are not enough.	The elders should be visited frequently.
	<p>There is no public nursing home and the fee for private homes is high.</p> <p>The university for the seniors is good</p>	Different kinds of nursing homes should be built.
	<p>The frequency of activities</p> <p>Activities are usually held.</p>	

Public infrastructure	The number of street lights is limited in the housing estate. The light is not enough and lighting hours are limited.	The light should be adjusted with the help of automatic sensing systems.
	The cover of drainage systems is in good management.	
	The auxiliary facilities for the disabled is not enough.	More auxiliary facilities should be built.
	The activity centre in the housing estate was sold with no agreement with residents.	Residents could appeal to the law.
Living	It is convenient to shop online but the logistical problems are serious.	The number of logistical sites (to collect packages) should be increased.

Appendix 2: Invitation letter to community deliberations

尊敬的碧海社区居民：

大家好！

在科学技术飞速发展、人民生活蒸蒸日上的今天，我们的城市也正面临着前所未有的挑战。人口的快速增长给教育，医疗，交通，环境等各方面的基础设施带来压力，居民生活质量的提高受到不同程度的阻碍。为了解决难题，突破困难，贵阳在最近几年积极寻求创新方法、利用科技的进步解决城市难题。建造智慧城市、打造智慧社区就是方法探索的其中之一。

今年5月数博会期间，贵阳市政府联手联合国开发计划署与大数据服务企业，启动在贵阳发展智慧城市的合作。碧海社区与会展城社区成为了合作试点社区。为了帮助贵阳的智慧城市能够更好地服务本地居民，贵阳市政府首先将与联合国开发计划署合作开发《贵阳智慧城市与社会治理指标体系》项目，指导碧海、会展城社区即将开始的智慧社区建设。

与以往的研究报告不同，这个项目将实际上由碧海、会展社区居民来书写。我们社区的居民将决定智慧城市的未来功能，以及如何为居民的生活、工作、学习带来便利。因此，在接下来的一年中，项目将在碧海、会展城社区组织开展一系列社区讨论。

是否需要更便利的网上学校来缓解教育资源的缺乏？是否期许更智能的安保系统以解决治安问题？是否盼望更便捷的医疗体系来提供健康保障？是否渴求更亲近的社区平台来增强邻里往来？我们将共同深入探讨这些问题，并使讨论结果成为碧海、会展城社区智慧社区建设的参考指标。

在碧海社区，讨论会将从9月10日开始的每周末在碧水云天、金翠湾、松景阁依次举行，具体安排如下：

小区	时间		地点
碧水云天	9月10日（周六）、11日（周日）	周六：9:30 ~ 12:00, 13:30 ~ 17:00	碧水云天物业公司办公室前空地
金翠湾	9月17日（周六）、18日（周日）	周日：13:00 ~ 17:00	金翠湾小区兴筑居委会办公室前空地
松景阁	9月24日（周六）、25日（周日）	17:00	松景阁小区松园居委会办公室前空地

届时您的踊跃参与将为自己亲手打造一个舒适、方便的生活环境，打造有智慧的碧海、会展社区，建设有大智慧的贵阳。我们的活动不限年龄，男女老少皆大欢迎。

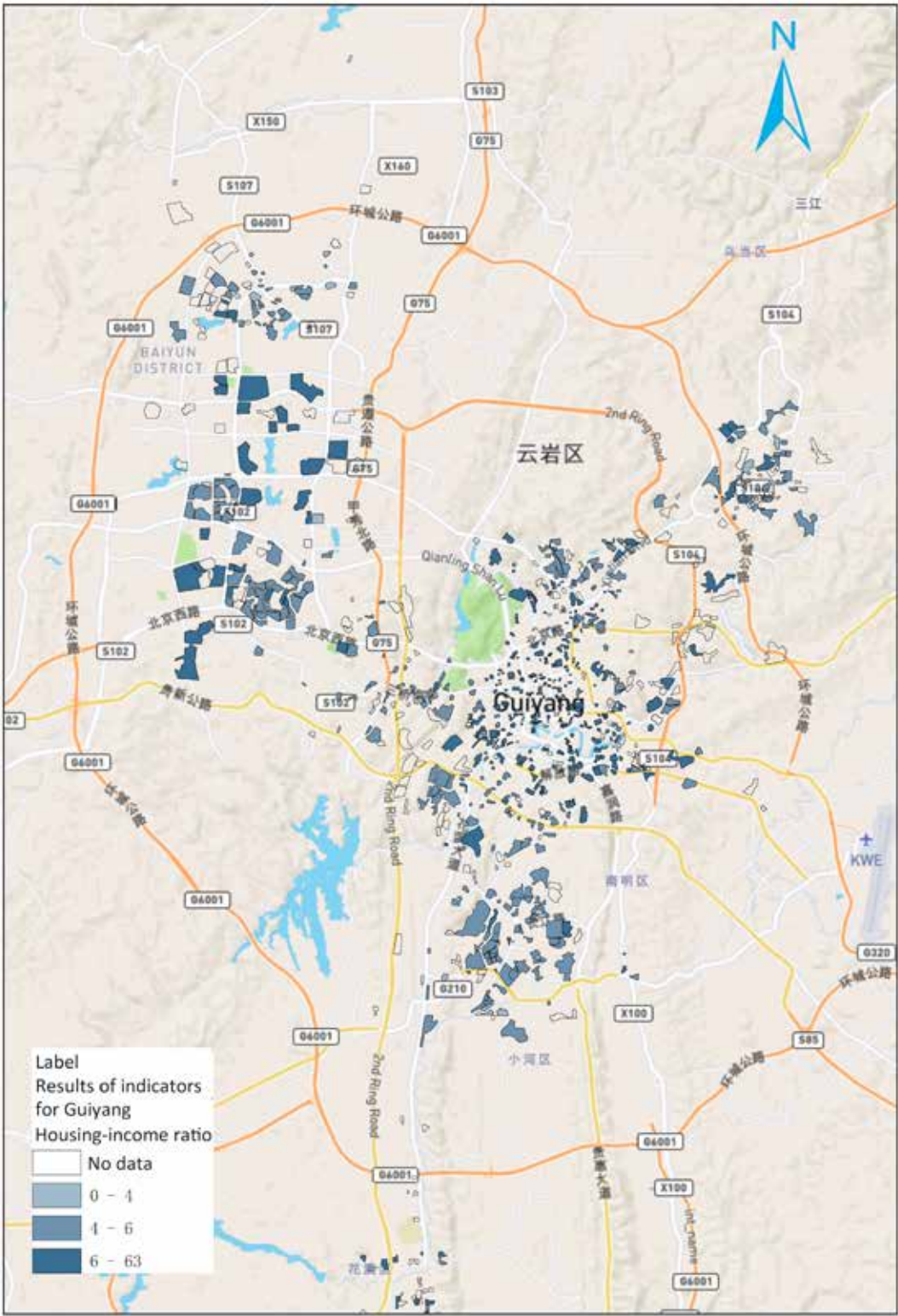
我们的项目微信公众号已经上线。扫描二维码，便可以知道更多和项目有关的信息，也可以与项目工作人员互动。项目邮箱已经开放，欢迎大家邮件咨询：smartcitygy@163.com。

“智慧观山湖”期待您的参与。大家不见不散！

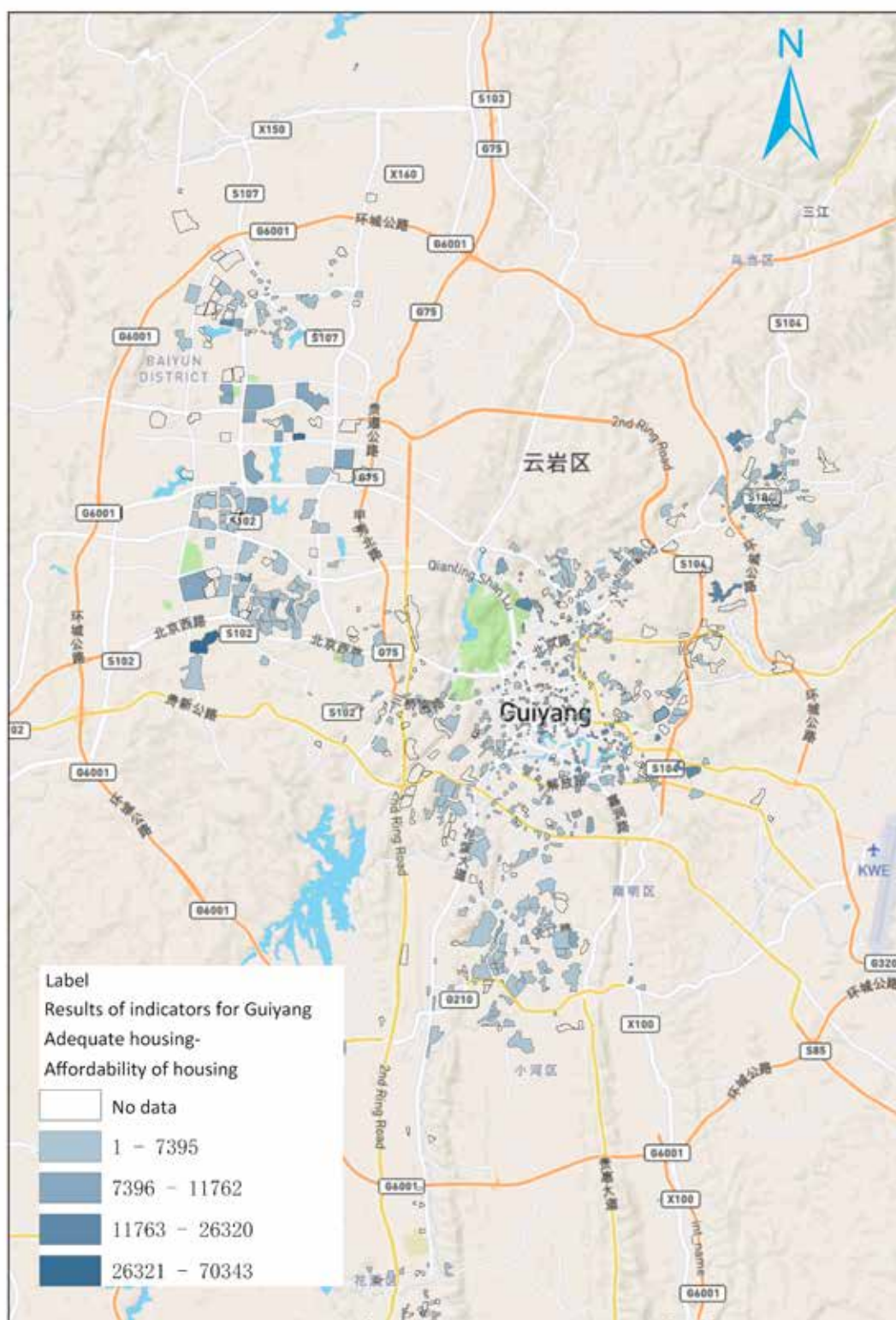


碧海社区服务中心
联合国开发计划署
2016年8月24日

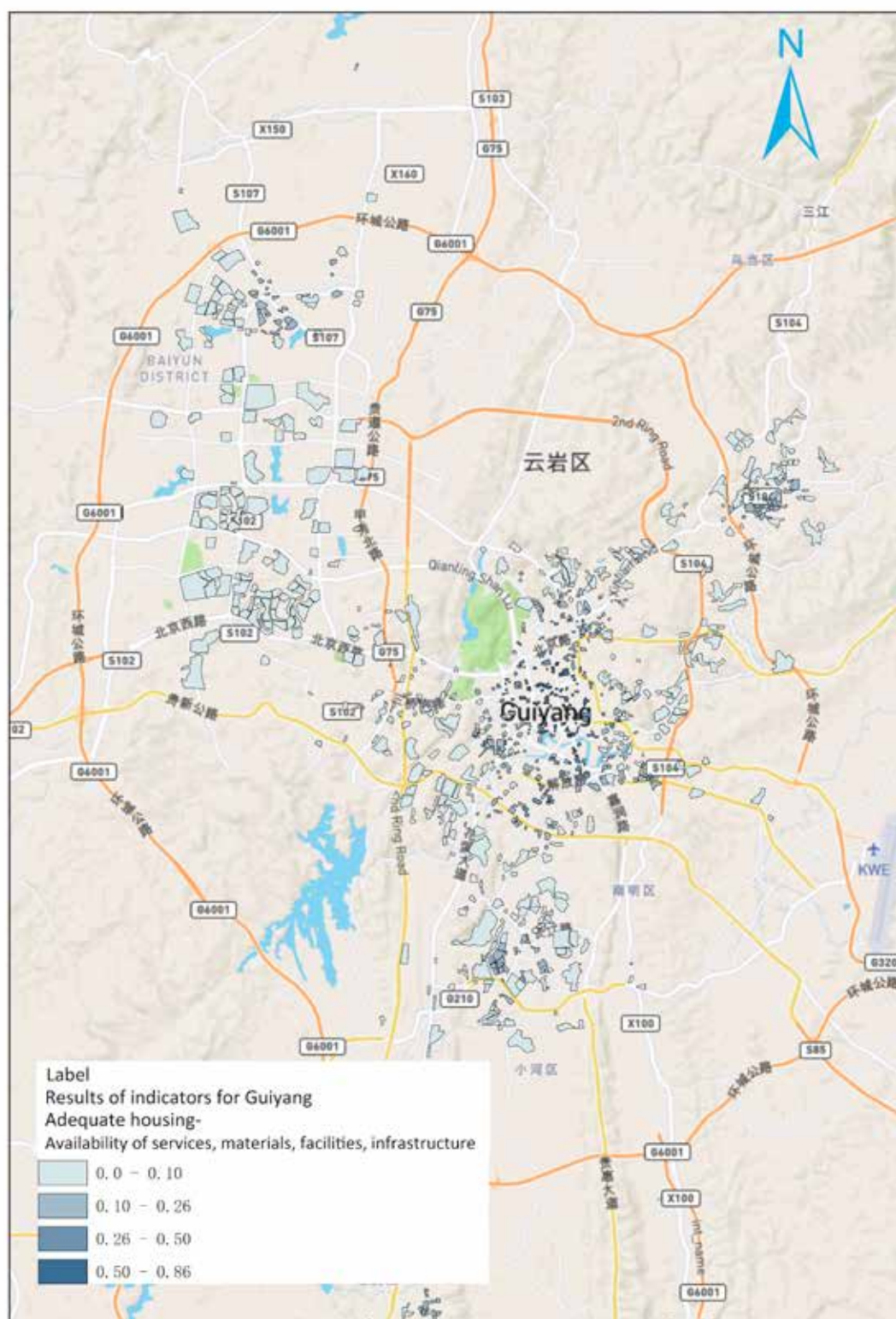
Appendix 3: Data visualisation maps for selected communities



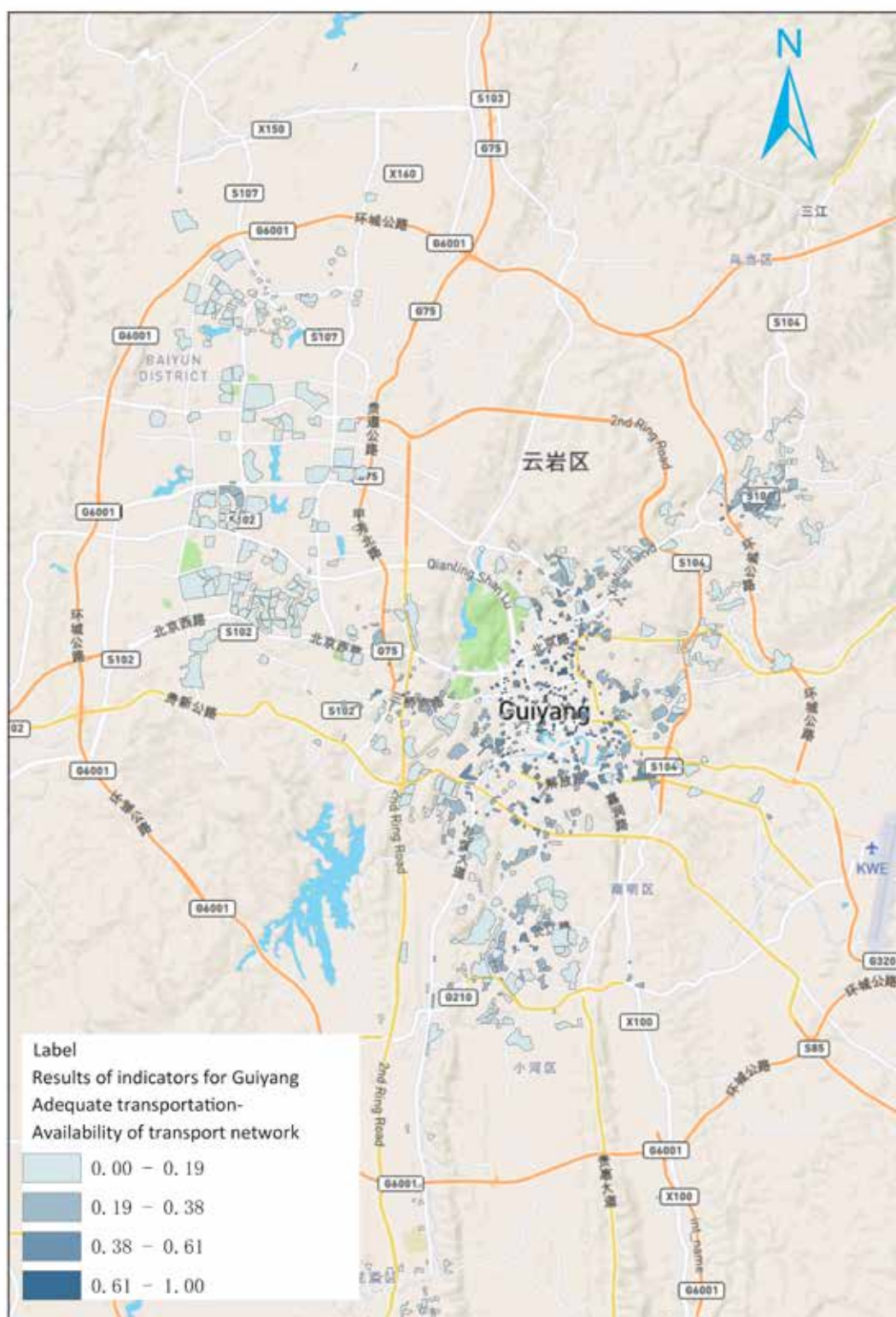
Map 1 Housing-income ratio



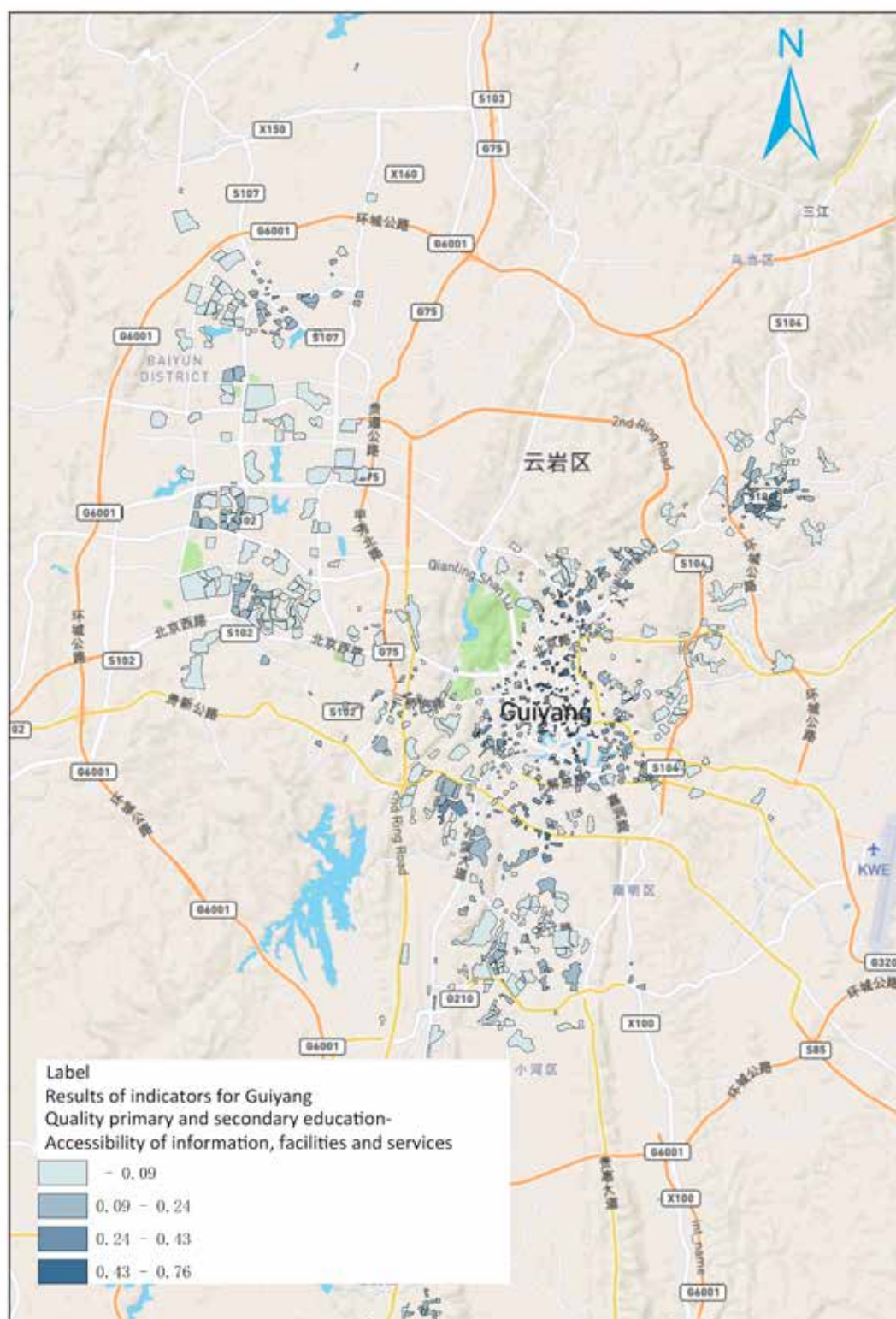
Map 2 Adequate housing-Affordability of housing (Indicator 6)



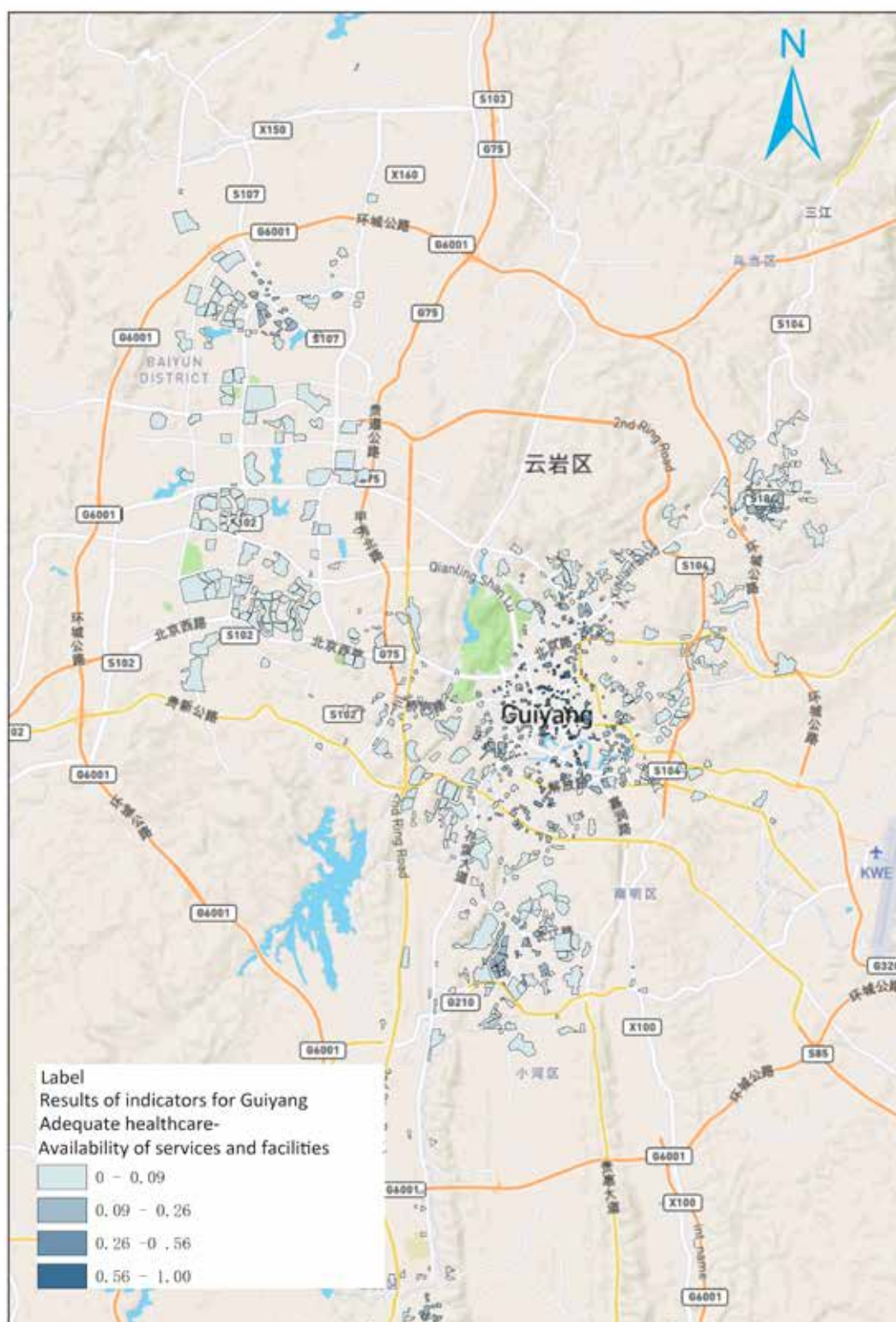
Map 3 Adequate housing-Availability of services, materials, facilities and infrastructure (Indicator 8)



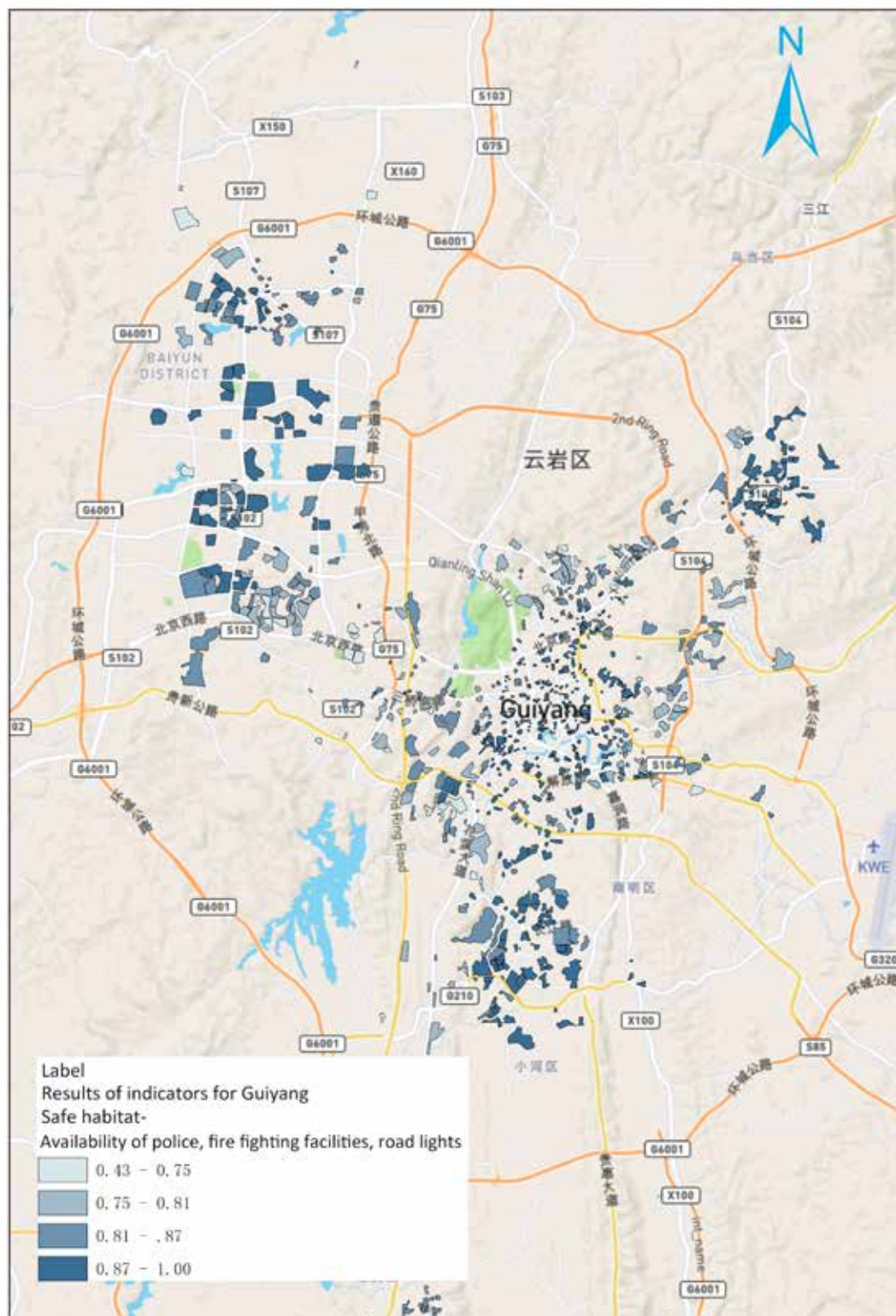
Map 4 Adequate transportation-Availability of transport network (Indicator 13)



**Map 5 Quality primary and secondary education-Accessibility of information, facilities and services
 (Indicator 17)**

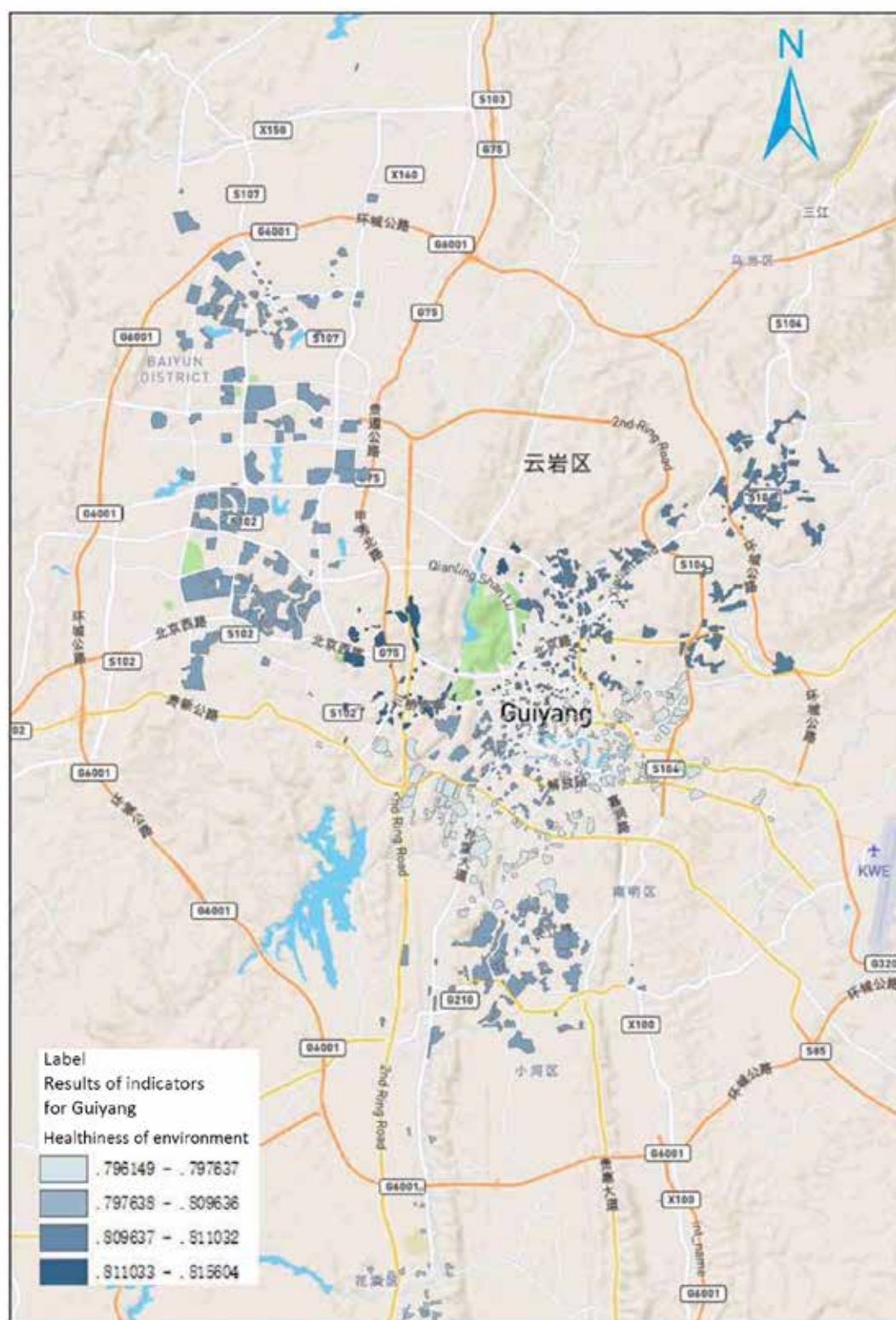


Map 6 Adequate healthcare-Availability of services and facilities (Indicator 19)



Map 7 Safe habitat-Availability of police, fire fighting facilities, road lights (Indicator 24)





Map 9 Green and protected environment-Healthiness of environment (Indicator 31)