Municipal Asset Management in China’s Small Cities and Towns

Findings and Strategies Ahead

Alessandra Campanaro
Joanna Masic

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Olga Kaganova
Hongye Fan
Hazem Abdelsattah
Abstract

Chinese municipalities have developed a large stock of capital assets during a period of rapid growth and urbanization, but have yet to modernize asset management practices. Cities face challenges such as premature decline of fixed assets and spiking liabilities related to operating and maintaining the assets. This paper evaluates the asset management practices in three selected small cities and towns in China, using a benchmarking assessment tool followed by an in-depth field assessment. The paper finds that overall performance is below half of international benchmark for good practice in all three cities. Management practices are considerably more advanced for land than for buildings and infrastructure. Key deficiencies in data availability and reporting, governance, capacity, and financial management indicate increased risks for local government finance and the delivery of public services. For small cities and towns where public revenues are often uncertain and limited, urban public services will be at risk of deterioration unless good asset management practices are put in place. The paper recommends strategic actions for both upper and lower levels of government to advance local asset management practices and facilitate the reform agenda.
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Alessandra Campanaro¹
Joanna Masic²

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Olga Kaganova
Hongye Fan
Hazem Abdelfattah

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¹ Social, Urban, Rural and Resilience Global Practice, World Bank, Washington, D.C., USA
<acampanaro@worldbank.org>
² Social, Urban, Rural and Resilience Global Practice, World Bank, Beijing, China <jmasic@worldbank.org>
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1. Introduction

Chinese cities have developed large stocks of capital assets during a period of rapid growth and urbanization, but have neglected to update their asset management practices. This has created massive current and future expense liabilities related to operating and maintaining these assets. Cities face premature deterioration of their fixed assets and, consequently, may require early investment in capital repair or replacement unless asset management is modernized. Furthermore, given the uncertainty and limitations on public revenues in small towns and cities, if good asset management practices are not put in place, urban public services will be at risk of deterioration unless financial assistance by national governments is assured.

Asset management is a process of making and implementing decisions regarding the operation, maintenance, refurbishment, acquisition, and disposal of fixed assets in a cost-effective manner and with the objective of providing the best possible service to local citizens (Kaganova & Kopanyi 2014). It is a key piece of municipal finance and shows increasing importance in developing countries, where local authorities often have limited flexibility to raise tax rates or impose new tax to increase public revenues. Studies have suggested that one of the main drives behind asset management reforms is the recognition of the financial payoff of better public asset management (Kaganova and McKellar 2006). This paper considers immovable fixed (capital) assets under the ownership and management of local governments and their state-owned enterprises (SOE’s). These include three major categories: buildings, land, and municipal infrastructure.

China has recognized the necessity of medium- and long-term budgeting of public finances, and in 2014 adopted a new budget law that provides for the introduction of modern asset management practices (such as multi-year capital investment plans). The law specifically requires better financial management of fixed assets. Key features call for consolidated budgeting of all government revenues and spending and improved budgetary performance and spending, especially for the delivery of better public services (most of which require fixed assets). The law also encourages local governments to adopt more sustainable mechanisms for investing in infrastructure through rigorous on-budget management of capital investments and a long-term view of financial management. China’s Ministry of Finance (MoF) also notes the importance of planning and managing operating costs associated with government assets (MoF 2014). All of these measures explicitly call on cities to improve the financial aspects of asset management.

Towns and town districts are important connecting points of China’s urban-rural dual economy and are expected to become the focal point of the next wave of urbanization. The number of towns in China grew from 2,173 in 1978 to 20,401 in 2014. The total population living in town districts—the urban core of towns—reached 312 million in 2014; this is 42 percent of China’s urban population and 23 percent of its national population. Towns absorb rural surplus labor and mitigate the migration pressure on large cities, which are absorbing 40 percent of the country’s rural-urban

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3 A central element of revenue generation in China has been the acquisition and rezoning of rural land and the auction of the municipal land rights for this land. This has severe future limitations given the finite availability of land available to acquire.
4 Fixed assets for the purposes of this report are buildings and infrastructure, that is, roads, bridges, water systems, utilities, housing, hospitals, schools, parks, etc.
5 Movable fixed assets, such as a transportation fleet, are not included because they are usually managed together with immovable assets or constitute a smaller value than immovable assets.
migrants and employing up to 70 percent of the labor force. Towns are expected to play an important role as settlements for newly urbanized populations, especially those located close to large metropolitan regions, thus fostering agglomeration and creating a virtuous cycle for economic growth and social transformation. This new urbanization trajectory that strengthens agglomeration economies will require comprehensive reforms in land and financial sector policies, fiscal policies, and measures to allow market forces to do more in allocating factors of production, particularly land and capital (World Bank and Development Research Center 2014b). Currently, Chinese city and county governments use three types of development plans to advance urban development: the five-year plan (FYP) of socio-economic development; the city master plan; and the land use plan (see box 1.1).

Box 1.1 Planning for Capital Investment in China

Chinese city and county governments rely on three major plans to advance urban development: (1) the five-year plan (FYP) of socio-economic development; (2) the city master plan; and (3) the land use plan (table B1.1.1). Different government divisions are responsible for the development, revision, and implementation of these three plans. Each of the plans serves a different purpose with regard to capital investment. The FYP determines the types of projects to be developed and their respective objectives. The city master plan decides where to build these projects and their spatial allocations. The land use plan allocates land slots among competing projects, subject to the aggregate land supply quota.

| Name of the document            | Government division         | Time horizon                           | Relationship with Capital Investment                     |
|---------------------------------|-----------------------------|----------------------------------------|--------------------------------------------------------|
| FYP of socio-economic development| Development & Reform Committee | 5 years                                | Development strategies; prioritization of investment projects, objectives of service delivery |
| City master plan                | Urban Planning Bureau       | 20 years for master plan; 5 years for near-term construction plan | Project identification and spatial arrangement          |
| Land use plan                   | Land and Natural Resource Bureau | 15 years for master plan; yearly for land supply plan | Land acquisition and concession                         |

Sector bureaus and divisions make sector work plans under the framework set by the FYP, city master plan, and land use plan. Often the sector work plan is made every year, and it identifies key projects or major investments for that year. Based on the work plan, a sector bureau prepares a project investment plan, project funding and a financing plan, and a project land use plan when applicable. Before implementing a project, the sector bureau or division needs to get approval of the project investment plan from the local development and reform commission, project funding and approval of the financing plan from the local finance bureau, and approval of the project land use plan from the land bureau. For instance, if a transport division of the construction bureau wants to build a new road, the transport division first needs to ensure the road is compliant with all three major city plans, and then has to identify the investment scale, as well as financial and technical details in the specific plans, to get approval from the respective bureaus.

As asset management is crucial to local government’s finance and their ability to provide good quality of urban public service, it is time to take a look at current status of municipal asset management in small cities and towns in China and identify strategies to advance their practices. The main objectives of this paper are threefold: (1) to identify why updating municipal asset
management practices is important by benchmarking asset management practices in three small cities and towns in China against international good practices; (2) to outline very practical recommendations regarding what cities can do to start improving their management of assets based on evaluation results; (3) to suggest strategic actions on the part of the upper levels of the government to facilitate and sustain local governments’ asset management reform agendas.  

2. Methodology

This paper is based on an assessment of current municipal asset management practices in three selected cities and towns: Linshui County Town in Sichuan Province, Chengcheng County Town in Shaanxi Province, and Laibin City in Guangxi Zhuang Autonomous Region (see figure 2.1). The rationale behind this selection is that they are fairly representative of western provinces in the south, south-middle, and north and also good examples of small cities and towns in China.

Figure 2.1: Location of Selected Cities and Towns

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6 Given the increasing importance of successful municipal asset management in future urban sustainability and municipal finance initiatives, the Bank is developing a more comprehensive and systematic approach to municipal asset management, transforming international good practices and methodologies into tools and training materials to create a critical mass of knowledge and support for the Bank’s China portfolio. It is hoped that these good practices will eventually be shared with other cities and towns. In parallel, other Bank teams are advancing efforts related to the new budget law, including municipal finance, multi-year capital budgeting, fixed asset accounting, public-private partnerships, etc.

7 The average per capita income of urban residents in the three towns in 2014 range from RMB 23,703 to RMB 27,374 (rural resident income range from RMB 7691 to RMB 9365). In comparison, the average per capita income in China was RMB 28,844 in 2014.
Linshui County is administratively under the prefecture-level city of Guang'an in eastern Sichuan province, with a population of 1.03 million and located within a 90-minute drive of Chongqing’s urban core. It has a well-established county town with a population of 139,000 and an industrial zone that is expanding to the south. In 2014, the total gross domestic product (GDP) of Linshui County was RMB 18.07 billion; total fixed asset investment was RMB 16.22 billion. Chengcheng County is under the jurisdiction of Weinan prefecture-level city in Shaanxi province. Located in the northeast of Guangzhong Plain, 180 km from Xi’an, the town has 135,000 urban residents, and its traditional agriculture-dominated economy has become more industrial over the last decade. Driven by the robust industrialization process, it is envisaged that the county will gain an additional 55,000 new urban residents by 2020. In 2014, the total GDP of Chengcheng County was RMB 8.53 billion, up 10 percent from 2013; total fixed asset investment was RMB 14.13 billion. Laibin is a prefecture-level city in the central part of the Guangxi Zhuang Autonomous Region (“Guangxi”) in southern China, among the least developed areas in the country. Laibin includes one district, one county-level city and four counties with a total population of approximately 2.5 million people. About 200,000 people live in the main urban center of the city. Laibin is a significant transportation hub comprised of several regional and national highways, important rail lines, and shipping along the Hongshui River to Hong Kong, Macau, and Guangzhou. In 2014, the total GDP of Laibin is RMB 55.1 billion.

2.1 Benchmarking Assessment for Local Governments

The methodology includes the use of a new rapid assessment tool followed by an in-depth field assessment of asset management in the three cities and towns. Unlike other assessments that focus on assets of one sector (such as water or roads), the methodology deployed here covers all three major categories of fixed assets owned and managed by local governments and their SOE’s: buildings, land, and infrastructure. The in-depth assessment concentrated on evaluating property and infrastructure portfolios, financial performance (in particular, approaches for planning and budgeting capital investments as well as operation and maintenance of fixed assets), and institutional arrangements. Based on all of the findings, recommendations are proposed for advancing and improving municipal asset management in small cities and towns in China through a range of short-, medium-, and long-term actions at the central and local government level.

The diagnostic tool was developed and deployed in the form of a survey of key aspects of municipal asset management. The tool combines several important elements: it defines a set of characteristics, based on international good practices, that include knowing what assets you have (inventorying), why the assets are needed (classification), and what is the market value of the capital assets (for good decision making and transactions). The tool also captures the need for good...
governance and transparency based on the use of auctions for allocating assets to the private sector and how these revenues are used. Other characteristics that are considered include the presence of a unified citywide framework for asset management, strategic asset management planning, training opportunities for staff, life-cycle costing and management, and capital investment planning and asset-related annual expense planning.

The survey results are converted into scoring and hence allow benchmarking performance over time and across entities. Each of the surveyed characteristics is converted into a question for local governments, and answers are scored on a scale from 0 to 1.\textsuperscript{14} This converts qualitative answers to a comparable quantitative score representing a local government’s level of advancement in asset management. Finally, a composite summary score is developed for each of the three groups of assets. The composite score is split into two sub-components measuring “basic asset management” and “advanced asset management” for buildings and infrastructure to provide additional guidance for decision makers. The output of this tool is an asset management scorecard for each city that displays color-coded quantitative scores for each characteristic.

The information and data collected through the survey and the scorecard results help policy makers and asset managers to benchmark their achievements and identify and prioritize improvements; the survey improves the accuracy and completeness of data collection and can be repeated over time to measure progress on reforms. It can also be a useful approach for disseminating best practices and peer learning among cities in the same country, which is especially beneficial since benchmarking is becoming a mainstream of good asset management (Biagi 2014; Towers 2013). At the same time, applying generic international operations and maintenance (O&M) assumptions and benchmarks in an assessment of whether these cities plan and spend enough for good asset maintenance carries the risk of underestimating or overestimating resource requirements.\textsuperscript{15} While these have been accounted for in the study, such estimates should be used cautiously and only when more reliable assessments of asset condition and needs are not feasible (NORC 2013). Furthermore, most recommendations are relevant for large cities in China as well as small ones. However, separate assessments may be needed for an asset management improvement agenda for large cities.

\subsection*{2.2 Review of Literature and International Best Practices}

Asset management enables local governments to assess how their assets can contribute to better service delivery, greater accountability, and improved long-term financial health. These elements are crucial for China's small city and town governments, especially when they are facing challenges such as equalizing social services for migrants and local residents (hukou holders)\textsuperscript{16},

\begin{itemize}
  \item \textsuperscript{14} Note that the survey focuses on systems of asset management, not specific holdings themselves; the survey does not deal with quantitative characteristics of asset holdings. This part of the assessment is covered by the in-depth technical assessment.
  \item \textsuperscript{15} The methodology includes special measures to mitigate the risk that the use of generic international parameters for O&M and depreciation costs would result in irrelevant or misleading data for the cities or conclusions of the report in general. On each occasion when such international parameters are used, the most conservative (i.e. low- to mid-end) numbers are applied, so that gaps in funding O&M and depreciation in the participating cities are not overestimated. Further, when relevant and feasible, geographic adjustment to China of international parameters of O&M costs are made or mentioned. These instances are carefully noted in the text.
  \item \textsuperscript{16} A hukou is a record in the household registration system.
\end{itemize}
increasing land acquisition and fiscal balance issues, and larger demand for infrastructure to facilitate urbanization-driven development.

The development of conceptual frameworks for government asset management originated during the 1980s and 1990s in the United Kingdom, Australia, New Zealand, and Canada. This came about as an attempt to address economic inefficiencies and the lack of accountability associated with poor government property management (Kaganova and McKellar, 2006) and in reaction to the privatization of former public utilities (IWR 2013). Professional organizations and governments began to formalize rules of asset management to optimize the mix of cost, risk, and performance over the life of their capital assets (IAM 2014).

International frameworks developed to facilitate the implementation of good municipal asset management by providing checklists of elements and implementation guidance. Widely used standards include Public Available Specification 55 (PAS 55), which was published by the British Standards Institution in 2004 and then transformed into an international standard, the ISO 55000 series; International Infrastructure Management Manual, which was developed by New Zealand and Australia; and Assessment of Tangible Capital Assets (PSAB 3150), which was developed by Canada. Cities that choose to adopt these standards commit to be compliant with a set of requirements in the relevant checklists. For instance, the ISO 55001: 2014 provides 71 requirements for good asset management, which are aligned with six subject groups—strategy and planning, asset information, asset management decision making, lifecycle delivery, organization and people, and risk review—covering a total of 39 subjects.

Two main concepts are embedded in these standards. First, good asset management should be strategic, systematic, and fact-based. An organization should design an asset management system that is aligned with its strategic goals, and make asset management decisions based on accurate and in-time information. This requires an asset strategy that includes financial planning, a clear inventory, a good governance structure, and an advanced information system. The second key concept is life-cycle management. Since the expense of operating, maintaining, and reconstructing property and infrastructure has a life-cycle pattern and accounts for an important part of municipal finance allocation, tracking and proactively maintaining an asset during its entire useful life has financial and practical implications for municipalities.

Despite difference in institutional contexts, good asset management practice of local governments across the world share some core features: good inventory, strategic financial planning, institutional structure with clear responsibilities, transparency, optimizing maintenance, and market-based evaluation (Kaganova and McKellar 2006).

**Good Inventory.** Asset management begins with an understanding of an entity’s assets, that is, the establishment of a comprehensive and updated inventory and rational classification. To make efficient, fact-based, and long-term decisions for assets, it is essential to develop and maintain

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17 ISO 55001 series sets out requirements of an asset management system; ISO 55002 provides additional useful guidance for applying ISO 55001; ISO 55000 gives an overview of the subject and sets out principles and terminology.

18 Specific requirement can be, for example, that “an organization’s asset management system shall include documented information for applicable legal and regulatory requirements” (IAM 2014).

19 The full list of subjects is provided in appendices.
comprehensive records of municipal properties. However, in developing countries including China, most local governments lack a good inventory system of municipal assets.

Advanced inventory and information management systems can be facilitated by accounting reforms in the public sector. For instance, following New Zealand’s public sector reforms in the 1990s, government agencies became compliant with generally accepted accounting principles (GAAP) and were required to keep good records of their assets and up-to-date accurate valuation. Information on location, plan, market valuation, acquisition, ownership, and current condition must be included in an asset register (Kaganova and McKellar 2006). In Canada, similarly, cities that adopt PSAB 3150 need to conduct initial valuation of all municipal tangible capital assets; the framework stipulates that local governments record comprehensive information on their asset portfolio, its value and its remaining useful life. This information also enables governments to identify any overall infrastructure deficit and to develop long-term plans to address that deficit (Jamer 2015).

**Strategic financial planning.** A strategic approach, including strategic financial planning, is crucial to maximize extraction of value from assets and deliver cost-effective public services. Local governments that have medium- or long-term asset strategies often achieve better outcomes, since asset management can help achieving holistic development goals. Good asset management can deliver exceptional services for citizens, improve the economic well-being of an area, correctly maintain built assets, generate efficiency gains, and improve the quality of the public realm (U.K. Department of Communities and Local Government 2008). Based on an understanding of these positive benefits, local governments in the United Kingdom were required to submit their asset management plans to the respective government offices with the aim of incentivizing local authorities to take a strategic approach and improve the performance of local asset management.\(^{20}\)

**Institutional structure with clear responsibilities.** Fragmentation of governance is not uncommon across developed and developing countries. This can result in a lack of clear roles and responsibilities and, ultimately, affect the efficiency of asset management. Though organizational structures for asset management vary greatly, a key principle is that a senior manager must be made responsible for asset management across the organization and an “asset champion” to whom the asset manager reports must exist at board level (Jones and White 2008). Also, a city asset management group, which is made up of representatives from different departments, should be established to collaborate on asset management issues and prepare annual reports. This helps to improve efficiency and minimize the impacts from fragmentation of governance. The city of Portland, Oregon in the United States provides a good example of this approach (see box 2.1).

**Transparency.** As a requirement of international standards (ISO 55001) and a common element in best practices, transparency is a simple, inexpensive, and effective way to facilitate good asset management and suppress corruption. Public disclosure of asset information not only enables public monitoring and engagement, but also stimulates governments to cautiously manage assets so as to avoid a negative image and promote public relations (Kaganova and Kopanyi 2014). Positive correlations between political integrity and municipal financial performance, especially in municipal bond sales, have also been studied. (Butler et al. 2009). Additionally, improving

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\(^{20}\) The requirement was dropped due to the rise of standards and performance. However, in recent years, there is a growing bias of “lost interest” in asset management across the United Kingdom.
transparency and curbing corruption will have positive impacts on municipal finances. Therefore, it is indispensable to review municipalities’ transparency regarding their asset information and to improve public disclosure of municipal asset reports.

**Optimizing infrastructure maintenance.** Asset maintenance increases municipalities’ savings in the long term and improves accountability. There is a bias among public officials toward building new infrastructure rather than making the most of existing capacity, leading to more expensive and less sustainable infrastructure solutions (McKinsey 2013; Jamer 2015). However, growing attention is being paid to optimizing maintenance of existing property and infrastructure. This has two important benefits: First, good maintenance can lead to the need for less frequent or less extensive repairs and can raise infrastructure’s capacity and longevity. Second, it reduces long-term costs due to underinvestment in maintenance.

For instance, it is estimated that if $12 billion had been invested in road maintenance across Africa in the 1990s, it could have saved the continent $45 billion in reconstruction costs (McKinsey 2013). Additionally, major repair and replacement costs for municipal assets must be planned and accounted for along with general maintenance. This is exemplified by the city of Tokyo, which accumulates special funds for asset replacement (see box 2.2). Regularly assessing and cataloging the condition of infrastructure assets and using a total cost of ownership (TCO) approach to allocating maintenance budgets are often required for municipalities to avoid losses and capture savings from improved maintenance operations (McKinsey 2013). This will minimize costs over the useful life of an asset; tailor maintenance strategies and policies to individual asset objectives and needs; and dedicate some proportion of funds for maintenance. In addition, the existence of a citywide multi-year Capital Investment Plan is taken into consideration as a positive factor when independent rating agencies assign creditworthiness to a city. This can have beneficial implications for city borrowing costs.

**Market-based valuation of property.** Market-based valuation enables local governments to be better informed about their financial status and reduces distortion caused by undervalued transactions, such as land sales. This has important policy implications for local asset management in China, especially since local governments have relied heavily on land sales to generate local revenues; however, local governments are increasingly being called on to move toward a more market-based approach in general. A good example of this can be seen in New Zealand, where all crown lands (state-owned lands) are accounted for and transacted at market value. This results in less distortion in the real estate market and fewer associated inefficiencies in the economy. The public sector can extract maximum financial benefits when disposing of surplus property. There are also fewer opportunities for corruption, compared to countries in which public property is sold at below market prices (Kaganova and McKellar 2006).
Box 2.1 Portland, Oregon (United States)
From Fragmentation and Underinvestment to a Citywide Approach

The city of Portland has made improving asset management an increasingly important priority over the last 25 years. More than a decade ago, a citywide strategic focus was adopted. Currently, six of Portland’s infrastructure bureaus—Transportation, Water, Environmental Services, Parks and Recreation, Development Commission (affordable housing), and Management and Finance—apply asset management principles to some of their practices. Improving asset management helps the Portland City Council, bureau managers, and citizens make informed decisions about asset-related services.

In 2002, Portland’s asset managers formed the City Asset Managers Group (CAMG) to collaborate on asset management issues and prepare an annual report on the city’s physical assets. The report is presented to the Planning and Development Directors’ Group, which represents the infrastructure bureaus and the bureaus responsible for development permits, finance, and planning. The Directors’ Group oversees policies and resource allocation, coordinates long-range planning, and manages certain cross-bureau planning and development initiatives. After reviewing the findings of the annual report, the Directors’ Group provides recommendations to the City Council. Each asset management report is presented to the City Council at the start of the annual budget work session.

Although the city’s various infrastructure bureaus continue to use different asset management strategies, they collaborate actively with the long-term goal of improving asset management practices citywide. As such, the bureaus use common definitions and terminology, but apply techniques consistent with their individual organization's structure and the unique needs of their assets. For example, in 2008, CAMG prepared a multi-year, integrated work plan to build capacity in citywide best practices. Its main elements (below) display the goal of collaborative progress and recognition of bureaus' respective needs.

- **Improve asset management practices:**
  - a. Continue with the citywide approach.
  - b. Review service levels and pursue community consultation.

- **Report status and condition of assets:**
  - a. Continue annual reports and improvements.

- **Prioritize infrastructure spending:**
  - a. Prepare strategies related to service levels, funding allocations, and management practices to align revenues with service levels.
  - b. Track local and regional discussions related to infrastructure financing.
  - c. Develop a funding strategy to shrink the unmet budget needs for infrastructure maintenance.

- **Integrate with related planning efforts:**
  - a. Integrate asset management into other planning efforts including community visioning, strategic planning, and long-term capital planning.
  - b. Track local and regional discussions related to infrastructure.

- **Prepare a plan to guide continued improvement in citywide asset management best practices:**
  - a. Complete an evaluation of current citywide asset management practices.
  - b. Identify key gaps based on research into best practices and bureau needs.
  - c. Prioritize improvements necessary to achieve best practices in asset management.
  - d. Establish implementation steps and schedule.

- **Build capacity to implement asset management best practices citywide and within capital bureaus:**
  - a. Enable bureaus to make continuous improvements to asset management practice based on their respective needs.

- **Use asset management as a tool to improve decision making:**
  - a. Define and revise service levels to align service provision with system requirements, community needs, and sustainable funding levels.
  - b. Determine appropriate asset management strategies to reduce maintenance liabilities.

(City of Portland 2009; City of Portland 2014)
3. Findings
3.1 Overview of Results

All three surveyed cities scored fairly similarly in terms of the current state of their asset management practices, with each showing signs that there is room for considerable improvement in certain aspects of asset management. The scores benchmark the current asset management practices in each city against each other and against international good practices. As shown in Table 3.1, the cities are roughly within the 45–49 percent range of the international benchmark for good practices (see detailed results in Appendix). Notable improvements are needed for each city to reach international good practice norms in asset management across the different asset types.

Scores for land management are high in all three cities, but there is no consistent trend in asset management systems for buildings and infrastructure. In Linshui, buildings and infrastructure management scored the same. In Chengcheng, infrastructure management appears to be somewhat more advanced than building management, whereas the reverse holds true for Laibin, with building management more advanced than infrastructure management.

| City and Town Performance as Percent of International Benchmark |
|---------------------------------------------------------------|
| Linshui | Chengcheng | Laibin |

21 This shows performance as of April 15, 2015, the deadline for the survey submission to build the scorecard.
|                      | Linshui | Chengcheng | Laibin |
|----------------------|---------|------------|--------|
| Buildings            | 44      | 38         | 43     |
| Land                 | 60      | 77         | 65     |
| Infrastructure       | 44      | 41         | 31     |
| **Overall Score**    | **48**  | **49**     | **45** |
| # of questions without response | none    | none       | 6.29   |

All three cities scored relatively poorly on how they manage buildings, suggesting there is much room for improving the management of this asset. A key strength of building asset management systems in the three cities is that buildings are estimated at market value before decisions are made about their allocation to the private sector, nongovernmental organizations (NGOs), or municipal enterprises. Allocation of buildings in Linshui and Chengcheng is conducted via public auction. Linshui and Laibin also reported that they have citywide frameworks in place that set out approaches to the management of buildings. However, these scores are outweighed by the cities’ weaknesses in governance, transparency, and financial management of buildings. Only one city (Chengcheng) sends reports on buildings to local government. Asset-related financial planning or long-term projections of capital expenditures for repairs and replacement of existing buildings are absent in all three cities. The cities’ also lack strategic management plans for buildings.

Scores for land management in all three cities are substantially higher (60 to 77 percent) than for buildings (38 to 44 percent) and infrastructure (31 to 44 percent). There is some variation among cities in scoring on land management: Chengcheng appears to be more advanced than Linshui and Laibin. Internationally, land is not usually as well managed as buildings and infrastructure. However, this result is consistent with the importance of land in China as a source of local revenues.

Management of land is based on the market value of properties, and allocation of land in all three cities is reportedly done by public auction. All three cities also record high transparency in reporting land transactions. This is better than in many countries transitioning from a centrally planned system to a more market-based system, where land transactions typically are reported rarely or are valued at market prices and allocated by public auction. However, strategic plans for land management are absent in all three cities.

All three cities score poorly on infrastructure management, although Laibin’s score is particularly low. It is worth noting that when scores for infrastructure are calculated as a percentage of the possible maximum, all three cities scored worse on "basic asset management" than on “advanced asset management.” This is because “basic asset management” for infrastructure includes four

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22 The reason is likely being that the cities follow policies or procedures for buildings that were introduced by the central government for management of public buildings, such as *Methods of State-Owned Asset Management in Administrative Units and Methods of State-Owned Asset Management in Public Institutions*.

23 There is no systematic data confirming this, but anecdotal evidence from places as different as Ottawa (Canada) as well as cities in the United States and Balkan countries confirm this.

24 These results are directly from what the authorities reported in the survey. However, the data on prices for industrial land allocated in Linshui shows that the price was fixed at a low-level (see Table 3.7) during 2010–2014. In Chengcheng, it remained nearly the same during the same period. This indicates that industrial land perhaps wasn’t auctioned, which is allowable under China’s Land Administration Law (2004) for certain types of land use assuming the approval of higher than county-level government. This would be consistent with general country statistics showing that during 2001–2012, the share of annual competitive allocations (vs. direct allocations) fluctuated in the range of 47–79 percent of the total allocations (World Bank 2014).
elements, two of which are related to transparency and reporting; if and when these two elements score at zero, the total score for “basic asset management” is heavily affected. Nonetheless, this reflects an important finding about the current stage of infrastructure asset management in these cities: they are still at an engineering-oriented stage of evolution, with less attention paid to good governance in general and transparency in particular. Preparing proper reports for decision makers and the public is a sign of maturity in terms of city and asset management (see box 1.1) that the selected cities have not reached yet. Further, as described below, financial management and planning is underdeveloped in these cities.

Several weaknesses in the cities’ asset management systems relating to governance and transparency were identified; these magnify risks for decision makers. Asset reporting to the public is almost universally absent. None of the cities prepares reports for the public on government buildings, land, and infrastructure; one partial exception is Laibin, which stated that it provides periodic reporting on land. Also, reporting on assets to local government decision makers is limited. Only one city noted that it makes such reports for buildings (Chengcheng); two cities (Chengcheng and Laibin) advised that they have such reporting for land; and no city said that it prepares reports on infrastructure. This signals the importance and urgency of shifting to proactive and well-informed asset management. In buildings and infrastructure management, such an approach is not yet in place. The lack of information available to the general public and decision makers on the status of most public assets magnifies the risk of short-sighted or uninformed decisions being made on the status of current local government assets.

Asset-related financial planning for buildings and, in most cases, for infrastructure, is lacking. All three cities lack the following elements of good practices: (i) projecting long-term investment needs related to existing buildings (that is, the need for capital repair and replacement); (ii) preparing and using a multi-year capital investment plan (as a part of the budgeting system); (iii) considering future life-cycle costs while planning technical solutions for capital investment in certain buildings (for example, considering more expensive construction materials or technologies that would make the construction more expensive but lead to overall savings during the life of the building due to cheaper operations and maintenance); and (iv) assessing impact of future operations and maintenance (O&M) costs resulting from planned capital investment in the future operating budget.

Survey results highlight that these cities have largely ignored the financing of operations, maintenance, and replacement of existing buildings and infrastructure, as well as the planning of new ones. Decisions are made with inadequate information, which can only lead to increased expenditure from municipal budgets in the future. There is insufficient accumulation of depreciation funds to pay for capital repair and replacement of existing buildings and infrastructure. For buildings, Laibin does not have such funding at all, while Linshui and Chengcheng claim they have partial funding for some buildings. For infrastructure, Chengcheng and Laibin don’t have such funding at all, and Linshui claims it has such funding for the majority of its infrastructure assets. In general, there is difficulty in adequately estimating O&M costs at the time the technical solutions for projects are selected (Laibin), and reportedly O&M budget costs are estimated only for some of the planned projects (Chengcheng and Laibin).
Proactive life-cycle management of buildings and records of their condition are absent\textsuperscript{25} in all of the cities with a few exceptions in Laibin. Preventive maintenance and scheduled repairs do not take place; instead, users or managers react to problems and breakages. For infrastructure, some proactive life-cycle management of existing assets is reported on the scorecards. However, this conflicts with interview findings, which showed that all maintenance and repairs are being made in a reactive mode (that is, after breakdowns and problems are reported) with a constant shortage of funding.

Staffs dealing with asset management have limited opportunities for training and development, which limits their capacity for prudent asset management. The weakest practices in this regard are associated with buildings and infrastructure. One city (Laibin) reported a good practice level for land management.

### 3.2 Asset Portfolios

Three cities own and control diverse properties (as shown in table 3.2), but inadequate inventory is identified across all categories of assets. First, the cities hold large stock of buildings, recently built or under completion,\textsuperscript{26} while lack complete information about the inventories. The scorecards show that inventories of buildings (or parts thereof) are complete in Linshui and Laibin, but not in Chengcheng. However, the in-depth assessment conducted in Linshui casts doubt on the level of completion of its inventory. In addition, the condition of buildings is not monitored in Linshui and Chengcheng. In Laibin, the condition of buildings is recorded in less than half the cases. Furthermore, the size of building portfolios remains imprecise: due to management fragmentation, building information in all three cities is incomplete. Yet important insights could still be drawn from some of the information provided during the in-depth assessments, particularly in Chengcheng where the authorities were able to share a list of 115 buildings. The total floor area of this portfolio is at least 573,300 square meters (m\textsuperscript{2}), and with the construction cost of public buildings in Chengcheng being approximately 1,300 RMB per m\textsuperscript{2}, the replacement value of this portfolio at least 745.3 million RMB (US$118.3 million).

| **Table 3.2 Main Types of Assets by Category** |
|-----------------------------------------------|
| **Asset Category** | **Main Types (Portfolios) of Assets** |
| **Buildings** | Office buildings for administrative use |
| | Apartments\textsuperscript{27} |
| | Educational facilities (kindergartens, schools, etc.) |
| | Healthcare facilities (hospitals and clinics) |
| | Commercial properties (shops) |
| | Cultural and sports facilities |
| **Land** | Land for public use on already urbanized territories |
| | Land allocated to long-term concessions (up to 40 years for commercial use, up to 50 years for industrial use, and up to 70 years for residential use), which requires contract management |

\textsuperscript{25} This conflicts, though, with the data provided by Chengcheng, which contained a list of 115 public buildings and defined the condition of all of them as “good.” This example illustrates, again, that data provided by cities often is conflicting and, unless verified by field inspections and cross-referenced, should not be treated as fully reliable.

\textsuperscript{26} For example, the opera house or the museum in Laibin or the vocational school and its dormitory in Linshui

\textsuperscript{27} Local governments have a mandate to provide housing for low-income families.
While public housing represents an important portfolio in terms of asset management, it is not included in the building inventory maintained by the state-owned asset management offices in Linshui and Chengcheng. This housing stock, being used entirely for private activities (that is, families’ residential use), is not subject to the inventorying. This is another significant indicator that local governments do not recognize the full scope of their asset holdings.

The cities own and control large and growing land holdings but have poor inventory management systems. Assessed at market value, these holdings would form the largest part of the city government’s wealth. Only Chengcheng has a complete inventory of land assets. In Laibin and Linshui, the land bureaus maintain only an inventory of land allocated to different types of users. By contrast, the Chengcheng land use plan shows unallocated land under government control in addition to registering land use rights for allocated land.

The scorecard results of the three cities show that the inventories of infrastructure assets are rarely complete. Only the inventory of streets and roads in Linshui is reported to be whole. In the three cities, the conditions of infrastructure assets are said to be recorded but to varying degrees. The conditions of solid waste facilities and of the road network are usually recorded. Overall, infrastructure management systems in Linshui perform better than those in the other two cities. Possibly this is explained by the fact that, in Linshui, water and part wastewater systems are not fully controlled by the county but rather by companies owned by upper levels of government.

### 3.3. Institutional Settings

The survey results for the three cities reveal a startling amount of institutional fragmentation, insufficient training and capacity building, and a lack of explicit policies and strategic planning for asset management. International experiences in asset management indicate that institutional settings are required to promote overall responsibility and control of assets. Oftentimes institutional settings are the result of history and reflect layers of past organizational decisions; hence, they are resistant to change, and it may not be easy to establish effective and efficient settings. Institutional deficiencies related to asset management are critical areas that require reform.

Institutional fragmentation is a serious systemic problem. The responsibilities for managing building and infrastructure assets controlled by each city are dispersed throughout a web of (i) bureaus, commissions, and offices that constitute the municipal or local government itself; and (ii)
SOEs owned or co-owned by the same-level government (and their subsidiaries where relevant) or by upper levels of government. Even for the same portfolio or type of assets, responsibilities are sometimes fragmented across different bureaus and SOEs. This division of roles and responsibilities usually is not justified by the nature of the assets or their life cycles and unavoidably results in cost inefficiency, inability to optimize the use of limited resources throughout a sector (for example, water, wastewater, etc.), and a dangerous mid- and long-term lack of strategic vision and approach to balancing new investment in systems’ extensions vs. capital repair of existing assets.\(^{30}\)

High fragmentation of management arrangements for infrastructure assets leaves each town without an entity with overall responsibility for planning, financing, and operating assets. As an example, consider the transportation sector in Linshui, where responsibilities are split between the transportation bureau, three SOEs, and two subsidiaries, all owned by the county government. Along the same lines, the management of wastewater services in Linshui separates sewage collection from sewage treatment. This effectively guarantees the lack of an entity with overall responsibility for running the wastewater system (planning, financing, operating), including frontline responsibility for industrial discharges.\(^{31}\) In contrast, in Organisation for Economic Co-operation and Development (OECD) countries, integrated wastewater utilities, which are often combined by the water company and considered part of the same service, are the norm (see case of France in box 3.1). In the selected cities, institutional arrangements hide the true total cost of wastewater service. Maintenance and depreciation costs can be overlooked by some entities in this fragmented context,\(^{32}\) especially since not all the entities are using the same accounting approach. Obscuring the costs also inhibits cost recovery.

There is insufficient capacity and training in the asset management offices in the three cities. The in-depth assessment uncovered capacity issues: In Linshui, only one out of four officials was able to run the Asset Management Registration System introduced by the Ministry of Finance in the state-owned asset management office. In Chengcheng, the officials of the land bureau could not run the geographic information systems (GIS) application, including maps for the holdings under their management.

Explicit policies and strategic planning related to asset management are lacking. There is no single or leading source of asset management policies—rather, implicit policies on asset management originate, directly and indirectly, from numerous sources such as laws, directives, and previous administrative practices. Accordingly, there are no comprehensive guidelines on asset

\(^{30}\) One example is the portfolio of educational facilities in Chengcheng, where the state-owned asset management office at the finance bureau is responsible for managing asset inventory, acquisition, and disposition, and the education bureau is in charge of maintenance, but with little or no monitoring of their performance.

\(^{31}\) In Linshui Town, the operation and maintenance of sewerage is the responsibility of the Urban Management Bureau. Meanwhile, the wastewater treatment plant (WWTP No. 1) is operated and maintained by Sichuan Linshui Aizhong Environmental Protection Co. Ltd., a subsidiary of Sichuan Guang’an AAA Public Co., Ltd. Further, the Linshui Housing and Urban-Rural Development Bureau is the entity responsible for planning, financing, and constructing any extension to the sewerage network. At the same time, Linshui County Yuanfeng Industry Development Company (LCYIDC) is in charge of constructing about 13 km of sewage interceptors connecting to the WWTP No. 2. This company is also responsible for overseeing the construction of the 4,000 m³/day WWTP No.3 and the associated sewage pipelines and treated effluent pipeline.

\(^{32}\) When municipal governments face fiscal constraints, many chose not to fully fund the operation, maintenance, and timely renewal of the wastewater networks (Browder et al. 2007).
management. These are particularly urgent for infrastructure assets. The absence of strategic asset management plans or similar specialized strategic guidelines can lead to inefficiencies in service delivery, substantial increases in operations and maintenance costs, and considerable losses in revenues. The lack of information sharing and integration has resulted in incomplete basic inventory data on local holdings.\textsuperscript{33} Such data would be an extremely useful tool for better informed and modern policy and government decision making.

**Box 3.1 France: Overcoming Fragmentation in Wastewater Management**

Internationally, wastewater systems are typically managed as unified businesses that include collection, transmission, and treatment. In France, the private sector is involved in water and wastewater management through lease agreements or concession contracts. This started in the mid-19th century when cities signed concessions with private water companies for the supply of drinking water. Today, according to the French Ministry of Environment, 75 percent of water and 50 percent of sanitation services are provided by the private sector, primarily by two firms, Veolia and Suez.

The typical form of delegated management (gestion déléguée) from the public to the private sector is through lease (affermage) contracts for 8 to 15 years. Private workers are responsible for operating and maintaining the assets and service. However, the municipality remains the owner of infrastructure assets and is responsible for funding and managing investment in these assets. Financing for this investment comes from the lease fee that the company-operator pays to the municipality. In some arrangements, the operator designs and manages the investment program on the city’s behalf. A critical part is that the operator’s costs are recovered and profit is obtained from end-user service fees.

*Concessions* get longer-term (20- to 30-year) contracts and may be responsible for some investments, as stipulated in concession contracts. Asset ownership still remains with the municipality, and the municipality is typically responsible for replacement of larger assets. All assets revert to the municipality at the end of the concession period, including assets purchased by the concessionaire. A concession covers an entire infrastructure system, and so may include the concessionaire taking over existing assets as well as building and operating new assets. In both cases, service tariffs for consumers are established by local governments at the level that allows cost recovery, profit for the operator, and a fee to the municipality.

(\textsuperscript{Salvetti 2014})

### 3.4. Financial Implications

In the absence of adequate asset management practices, local governments will spend more money to prematurely repair and replace assets. Proper proactive maintenance and repairs prolong the life of assets. Preventative asset management is more important for buildings and infrastructure, and Chinese cities score poorly on asset management for these classes as opposed to land.

From a financial viewpoint, there is a fundamental difference between land as the asset class, on the one hand, and buildings and infrastructure, on the other. Sales of land concessions on municipal land (mainly converted from rural to urban) have constituted an important source of net revenues for local governments over the past 15 years in China.\textsuperscript{34} Public buildings and most forms of

\textsuperscript{33} One example is the case of Linshui, where the Asset Management Registration System contains some data, albeit limited, partial and inconsistent.

\textsuperscript{34} In other words, the cost of acquiring land has been lower than the revenues obtained when the land is sold for development. It is less clear whether the balance has always been positive if the cost of infrastructure is factored in. There is no universal agreement on this. A World Bank report states that the revenues from land allocation always
infrastructure do not generate revenue but rather constitute "cost centers" for local governments. Even if these assets sometimes generate revenues (for example, income from building rentals or tariffs for infrastructure services), pricing of services usually does not recover the full cost of maintenance. Therefore, it is important to understand and quantify financial links between fixed assets and municipal budgets for the fiscal health and sustainability of local governments.

Overview of Linshui, Chengcheng, and Laibin Revenues

Total revenues of city and county governments include local fiscal revenues, local non-fiscal revenues, and transfers from upper-level governments. Tax and non-tax revenues (for instance, administration fees) make up local fiscal revenues. Non-fiscal revenues include gains from investments and land revenues. Upper-level government transfers are composed of tax rebates, general transfers, and earmarked transfers.

For the three cities assessed, intergovernmental fiscal transfers from the central level have been a dominant source of their total revenues. Fiscal transfers constituted about 68–75 percent of all revenues for Linshui, as an example (table 3.3). For local financial management, this can be a blessing and a curse. On the one hand, upper governments can bail out or stabilize local budgets if their own-source revenues decline. On the other hand, this leaves local governments in perpetual uncertainty, making financial planning difficult even in the medium term. The second largest source of local revenues (local fund revenues in Linshui and local fiscal revenues in Chengcheng) is much smaller and may vary from one year to another.

There is no consistent data on local revenues by source. The data on local non-fiscal revenues (including land revenues) and the land revenues themselves can conflict, as in the case of Linshui where the land revenues are shown to be substantially larger than the non-fiscal revenues of which they are only a part. One reason for this is that the data on land concession revenue is provided by the land bureau, whereas the land income within the non-fiscal revenue is calculated by the finance bureau, and their methodologies differ. The land bureau records the land concession revenue according to contract signing time, while the finance bureau records the land revenue on a cash-received basis.

The finance bureau’s annual statistics record the actual revenues received by the county government. The data in the land bureau’s statistics consists of the revenues stipulated on contracts signed in a particular year, which may not be received immediately. However, the discussion of the land concession revenues below is based on data from the land bureau since data from the finance bureau was not available. This data, while overstating absolute amounts of the land revenues (as compared to data showing revenue actually collected), is still useful for understanding other features, such as volatility, and for identifying the maximum that the land could generate in a particular year.

recovered the costs of land acquisition, infrastructure provision, and other related expenses and produced a profit (though the profit has been declining) (World Bank 2014). However, given high indebtedness of local government SOEs and other vehicles, this account is challenged by some experts.

35 The time periods covered in this and next sections vary because of differences in the availability of data from the three counties.

36 http://stock.jrj.com.cn/2015/04/22160519132503.shtml
Table 3.3 Revenues of the Linshui Local Government by Source (RMB million)

|                | 2008  | 2009  | 2010  | 2011  | 2012  | 2013  |
|----------------|-------|-------|-------|-------|-------|-------|
| Fiscal revenue | 191   | 241   | 314   | 414   | 489   | 581   |
| Non-fiscal revenue | 118   | 314   | 448   | 534   | 541   | 725   |
| Fiscal transfers | 925   | 1,289 | 1,607 | 1,939 | 2,348 | 2,743 |
| **Total**      | **1,234** | **1,844** | **2,369** | **2,887** | **3,378** | **4,049** |

*Source: Project Appraisal Document of World Bank Sichuan Chongqing Cooperation: Guang’an Demonstration Area Infrastructure Development Project, 2015*

**Land Concession Revenues**

The share of land concession revenues to total revenues varies from city to city. In Linshui, from 2010 to 2013, average land concession revenue was 19 percent of total revenues (table 3.4). This share fluctuated substantially from 7 percent in 2011 to 25 percent in 2012. Absolute revenues for land concessions have been volatile as well. Moreover, greater volatility is seen in land prices and revenues by subsectors (that is, industrial land, and commercial and residential land). While the price of industrial land has been steady since 2010, the price of commercial and residential land increased until 2013 with an average growth rate of 46 percent per year. However, in 2014, the price of commercial and residential land fell by about 70 percent (table 3.5) and with a steep decline in land area sold, revenue from sales of commercial and residential land dropped even more sharply.

In Linshui, land-based revenues have been highly unstable. Recent years’ trend may indicate that the demand for residential and commercial land in Linshui is shrinking. Despite strong growth rates from 2010–2013, industrial land area leased was 6.4 times higher in 2013 than in 2014, which may result from a combination of factors including the large accumulated stock of auctioned land; tightened control policy of land auction; and slowing land conversion from rural to urban. Overall, land-based revenues declined by more than 95 percent from 2013 to 2014 (see table 3.5, aggregate land concession revenue). This decline is equivalent to 23 percent of Linshui’s total revenues of 2013.

Table 3.4 Contribution of Land Revenues to Total Revenues in Linshui County, 2010-2013

|                | 2010  | 2011  | 2012  | 2013  |
|----------------|-------|-------|-------|-------|
| Total revenues, RMB million | 2,369 | 2,887 | 3,377 | 4,049 |
| State-owned land concession revenues, RMB million | 443   | 214   | 837   | 949   |
| **Land concession revenue as share of total disposable revenues**, % | **19** | **7**  | **25** | **23** |

*Source: Data provided by Linshui County Government*

Table 3.5 Linshui Land Concession Revenue, 2010–2014

|                | 2010  | 2011  | 2012  | 2013  |
|----------------|-------|-------|-------|-------|
| Fiscal revenue | 191   | 241   | 314   | 414   |
| Non-fiscal revenue | 118   | 314   | 448   | 534   |
| Fiscal transfers | 925   | 1,289 | 1,607 | 1,939 |
| **Total**      | **1,234** | **1,844** | **2,369** | **2,887** |

*Source: Project Appraisal Document of World Bank Sichuan Chongqing Cooperation: Guang’an Demonstration Area Infrastructure Development Project, 2015*

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37 Land concession revenue is higher than non-fiscal revenue. The land bureau records land concession revenue using a method that calculates this income according to contract signing time; the money may not yet have been received by the county. In contrast, non-fiscal revenue is calculated by the finance bureau according to when money is received (Chinese Business News 2015). [http://stock.jrj.com.cn/2015/04/22160519132503.shtml](http://stock.jrj.com.cn/2015/04/22160519132503.shtml)

38 Which is the last year for which the revenue data was available for this report.
In Chengcheng County, the total land revenue increased steadily during the past five years, but the risk of high volatility remains. From 2012 to 2014, land concession revenues averaged 15 percent of total fiscal revenue, rising from 10 percent to 20 percent (see table 3.6). Land concession revenue increased 2.8 times from 2010 to 2011, with an average growth rate of 46 percent from 2011 to 2014. Despite the price of industrial land staying constant from 2010 to 2013, the revenues from industrial land increased by 67 percent in 2013 and dropped a little in 2014. The price of commercial and residential land has fluctuated during the past five years, with a peak of 730,000 RMB per mu\(^39\) in 2012 (see table 3.7). The area of commercial and residential land leased increased from 2010 to 2014, while the area of industrial land leased was volatile (Table 3.7): it increased in 2011, but then dramatically decreased to less than one-eighth of that in 2012 even though the price was the same from 2010 to 2012. The drop in land area leased might have resulted from (i) change in the land supply policy and (ii) reduction in funds available for land acquisition given growing costs. Total land revenue kept increasing from RMB 40 million in 2010 to RMB 380 million in 2014 (table 3.7) because commercial and residential land is a dominant source of the land concession revenue. However, similar to Linshui, Chengcheng County may be exposed to the risk of volatile land revenues in the future.

### Table 3.6 Contribution of Land Revenues to Total Revenues in Chengcheng, 2012–2014

|                        | 2012 | 2013 | 2014 |
|------------------------|------|------|------|
| Total revenues, RMB million | 1686 | 1777 | 1935 |
| State-owned land concession revenues, RMB million | 176 | 262 | 380 |
| **Land concession revenue as share of total disposable revenues, %** | 10 | 15 | 20 |

Source: Data provided by Chengcheng County Government

### Table 3.7 Chengcheng Land Concession Revenue, 2010–2014

| Item/Year                          | 2010 | 2011 | 2012 | 2013 | 2014 |
|------------------------------------|------|------|------|------|------|
| Commercial and residential land area sold (mu) | 58   | 162  | 239  | 407  | 791  |
| **Commercial and residential land price (10,000 RMB/mu)** | 33  | 47   | 73   | 61   | 47   |
| Industrial land area sold (mu)     | 258  | 824  | 10   | 120  | 80   |
| **Industrial land price (10,000 RMB/mu)** | 6   | 6    | 6    | 10   | 8    |
| Aggregate land concession revenue (RMB million) | 40  | 123  | 176  | 262  | 380  |

Source: Data provided by Chengcheng County Government

\(^{39}\) The mu is a Chinese land measurement. One hectare is equivalent to about 15 mu.
In Laibin, land concession sales account for a substantial and growing, though volatile, share of total municipal revenues. From 2006 to 2011, land concession revenues averaged 16 percent of total revenues, growing from 3 percent to 31 percent (table 3.8). As evidence of the volatility of land revenues, the absolute amount dropped from 2007 to 2008 (table 3.8) and prices of land dropped sharply in 2012 as compared to 2011 (table 3.9), consistent with a price decline nationwide.

Table 3.8 Contribution of Land Revenues to Total Revenues in Laibin, 2006–2011

|                | 2006     | 2007     | 2008     | 2009     | 2010     | 2011     |
|----------------|----------|----------|----------|----------|----------|----------|
| Total revenues, 10,000 RMB | 112,069  | 196,320  | 229,601  | 281,761  | 454,595  | 715,303  |
| State-owned land concession revenues, 10,000 RMB | 3,146    | 35,302   | 23,115   | 34,284   | 101,830  | 223,171  |
| Land concession revenue as share of total revenues, % | 3        | 18       | 10       | 12       | 22       | 31       |

Source: Laibin Inception Report: Initial Diagnostic and Recommendations, December 2012

Table 3.9 Laibin Land Concession Revenue, 2010-2012

| Item/Year                                    | 2010     | 2011     | 2012 (partial) |
|----------------------------------------------|----------|----------|----------------|
| Commercial and residential land area sold (mu) | 1,200    | 2,325    | 1,328          |
| Commercial and residential land price (10,000 RMB/mu) | 101      | 187.9    | 75.3           |
| Industrial land area sold (mu)                | 5,856    | 1,400    | 2,384          |
| Industrial land price (10,000 RMB /mu)        | 8.4      | 12.6     | 10.7           |
| Aggregate land concession revenue (RMB million) | 1.7      | 4.5      | 1.2            |

Source: Laibin Inception Report: Initial Diagnostic and Recommendations, December 2012

The high volatility of prices and amount of land sold results in unpredictable local revenues from sales of land concessions. Two cities have already faced sharp declines in these revenue streams. Linshui’s land revenues dropped from 2013 to 2014 by 25 percent of the total 2013 city revenue (a catastrophic decline by international standards). Laibin experienced a 73 percent in land revenues from 2011 to 2012. This may indicate that an unavoidable decline in land concession revenues is beginning.40

Sustainability is a serious concern: one-time revenues from a finite resource like land cannot be a sustainable source of recurrent revenues (Peterson 2008). The city’s territory cannot grow forever by consuming new land for sale, and payable demand for land is not infinite either, especially given the potential housing affordability gap (that is, the difference between prices that recover total cost and what buyers might be able to pay). Implications for asset management are that even when land is managed relatively well, as in the case of all three cities, the revenues from it cannot be considered a stable source of funding for asset-related expenses, such as capital investment in buildings and infrastructure.41

40 Notably, in Laibin, a decline in land sales immediately results in a decline of land concession revenues since the land concession fee is one-time and payable within 40 days of the sale. Details about Linshui and Chengcheng are not available for this report. In some other cities, the effect of declining land sale revenues on city budgets would be buffered because payments are made in installments. For example, in Beijing, buyers of land concessions pay 35 percent up front and the rest in installments, according to You-Tien Hsing (2010).

41 The instability of this revenue source is magnified, as already mentioned, by the fact that within existing practices,
**Asset-Associated Expenses**

Cities have five groups of current and future expenses related to fixed assets such as buildings and infrastructure: (i) capital investment in new buildings and infrastructure; (ii) future annual operation and maintenance (O&M) expenses related to planned new buildings and infrastructure; (iii) capital investment in capital repair, renovation, or replacement of existing buildings and infrastructure; (iv) annual O&M expenses for existing fixed assets; and (v) repayment of debt incurred in the past for capital investment in such assets. The high indebtedness of local governments and their debt-bearing SOEs and other entities is a well-known concern, and the three cities studied are not an exception.\(^{42}\) However, this subject, is beyond the immediate scope of this report even though it is relevant for Linshui, Chengcheng, and Laibin. The four other types of expenses listed above are interrelated. For example, future O&M costs roll into current O&M expenses as soon as new buildings or infrastructure are built and put in operation. For analysis, though, it is useful to distinguish these four types.

Financial and life-cycle monitoring and management of fixed assets are almost nonexistent based on the survey findings. Reliable and reasonably complete quantitative estimates of the above four types of expenses are not possible at this time. However, as shown below, even partial and illustrative estimates signal that these aspects of asset management need attention if negative consequences of the current practices are to be avoided or at least managed.

**Capital Investment**

It is difficult to find information on total capital investment in public property and urban infrastructure spending in the three cities. In addition, overall planning, delivery, funding, and financing of public property and infrastructure takes place within what the literature calls fiscal fragmentation—multiple, intertwined channels—that is typical for all cities in China. Thus, that not all investment in acquiring or building property and infrastructure is coordinated or prioritized, and not all investment is reported or even recognizable. The fiscal fragmentation mirrors and relates directly to the institutional fragmentation already discussed.

The problem is not the use of multiple sources of funding (which is a well-known international practice) but rather the fragmented decision making, off-budget spending, and liabilities, as well as the lack of consolidated financial reporting. In particular, the municipal budget is intertwined with the budgets of SOEs, and as such, a substantial portion of capital investment made with public funding might be not reflected on municipal budgets. Thus, capital construction by SOEs themselves is not shown in the municipal budget, while it is funded, at least partly, by subsidies and transfers from the municipal budget. For example, the shopping, entertainment and hotel mall that was built in 2012 by Laibin Real Estate Company, a subsidiary of the Laibin Guizhongshuicheng Development and Investment Co. Ltd., is located on land that was purchased using a subsidy provided by Laibin City. Furthermore, the private sector’s contribution via various channels is impossible to estimate. To illustrate the practice, in Chengcheng County Town, the sources of funding and financing infrastructure, by order of importance, are as follows:\(^{43}\) fiscal

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\(^{42}\) In particular, some of their SOEs have substantial debt compared to their assets.

\(^{43}\) According to a semi-structured interviews with local bureaus.
transfers, local government revenues, loans from the State Development Bank, loans from international financial institutions (World Bank), land substitution, and advances from contractors and public-private partnerships (PPPs).\textsuperscript{44} Typically, each project is financed from two or three sources maximum. Resettlement projects are financed from the Chengcheng County Housing Guarantee Fund.

**Operation and Maintenance Expense Liabilities**

Each town’s growth and investment in construction of new capital assets helps create current GDP, but it also creates future expense liabilities to manage, operate, maintain, repair, and recapitalize these assets.\textsuperscript{45} In turn, this implies annual O&M costs, even if accumulation of recapitalization funding, similar to Tokyo (box 2.2), is not done. Within good practices, O&M costs need to be estimated and predicted. For an example, see the case of France (see box 3.1).

Based on current practices in the three cities, O&M costs are usually not budgeted (neither at conception of investment, nor in a recurrent manner during the lifetime of the asset) and are left for some future date. Further, as the scorecards show, annual O&M expenses for existing buildings and infrastructure are not systematically monitored, with the exception of some infrastructure systems in Linshui and buildings in Laibin. Moreover, there are no established guidelines for planning O&M expenses for municipal fixed assets, and estimates sometimes used by building design institutes are insufficient compared to international experiences. The comparison in table 3.10 indicates that current planning and spending practices underinvest in operations and maintenance of fixed assets, and are, on average, in the magnitude of at least 2-3 times—and sometimes up to 10 times—lower than international benchmarks for good practices.

| Type of Expenditure                                                                 | Amount allocated for public buildings and pipeline networks in Linshui and Chengcheng, as % of initial capital cost:\textsuperscript{46} | Amount required for public buildings according to international good practice, as % of the replacement cost\textsuperscript{47} | Amount required for pipeline networks according to international good practice, as % of the replacement cost\textsuperscript{48} |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| O&M                                                                              | 1% (in the best case)                                                                                                               | 6.8%                                                                                                                             | 1% - 3%                                                                                                                             |

\textsuperscript{44} For more information about World Bank Group, Public-Private Partnership in Infrastructure Resource Center (PPPIRC) visit its website at http://ppp.worldbank.org/public-private-partnership/

\textsuperscript{45} “Recapitalization” here means supporting the economic value of an asset during its lifetime. In practice, this includes substantial repair and eventual replacement of an asset. In good practices (e.g., a school district in Tokyo), recapitalization is funded from specially designated “reserve funds” or “depreciation funds” that accumulate annual depreciation and are funded, in turn, either from tariffs for services or from annual budgets associated with facilities.

\textsuperscript{46} Such percentages (1 percent for buildings and pipelines and 2 percent for roads, etc.) are customary (not mandatory) norms used by some design institutes in China when they estimate O&M expenses in feasibility studies for construction projects. In reality, interviews with experts in the selected cities indicated that even these amounts may be not available at budget allocations.

\textsuperscript{47} These numbers assume a 50-year life span of buildings and are calibrated for Washington, DC and, hence, should be subject to geographic adjustments. In fact, Whitestone Research indicates that Shanghai may have O&M costs roughly around one-third of Washington, DC. Even with this reduction, costs would still constitute about 2.2 percent, not the 1 percent currently assumed if at all (Kaganova 2011).

\textsuperscript{48} The "replacement cost" is the international terminology and approach that reflects inflation over time (NORC 2013).
Accumulated depreciation | For minority of buildings, only; the amount is unknown | 2.4 to 2.9% | Partly included in the above %
--- | --- | --- | ---

O&M expenses are often defined on an ad hoc basis in the general budget regardless of real needs. In 2012 in Laibin, for example, city technical staff estimated that only about 10 percent of repair needs were budgeted on average across bureaus (Laibin Inception Report 2012). During 2012–2014, the city administration in Chengcheng allocated a constant 1.2 percent of the total city expenditures for O&M for office buildings.\(^49\) While this resulted in the amount increasing annually, given that the city budget was increasing, it does not imply these were sufficient amounts.

Local governments also substantially underinvest in funding for future capital repair and replacement. Laibin does not invest in future capital repair and replacement at all; Chengcheng has such investment in a few cases for buildings and lacks it for infrastructure; and Linshui has partial funding for buildings and infrastructure. Meanwhile, having sufficient reserve funds is considered to be the best international practice, similar to Tokyo’s plan for future depreciation of assets (see box 2.2).

New capital investments do not take into account optimization of the current network. Another manifestation of underinvestment in maintaining existing infrastructure is that, in Linshui and Chengcheng, capital investment in water, wastewater, and road systems for 2015–2025 is almost exclusively planned for new additions or new infrastructure, with few instances planned for capital repair or replacement of existing structures. Finally, it should be reiterated that multi-year capital investment planning does not exist in Chinese cities, and all capital planning is done on an annual basis only.

Oversight of asset O&M has been a vastly diffused and much ignored practice in China. To summarize, local governments largely do not know the amounts they need for operation and maintenance (O&M) or future capital repair and replacement of existing and planned assets. International experience is that these annual costs can be substantial compared to initial capital costs and annual municipal budgets. Despite fragmented data, it is evident that current spending on O&M is vastly insufficient. As already mentioned, accumulation of funding for future replacement of assets is either completely lacking or inadequate. Moreover, capital investment is made almost exclusively in extensions of systems and new construction, rather than repair or replacement of existing systems. Thus, it is critical for local governments in China to start estimating real O&M and repair and replacement needs and to plan for them as part of municipal budgets.

The current practice exposes cities to multiple risks ranging from the development of unsafe buildings and infrastructure to financial vulnerability in the long term. Improved asset management practices, especially if introduced into city budgeting systematically for all buildings and infrastructure, will be costly. If left unchanged, current practices will result in (i) buildings and other fixed assets deteriorating prematurely (as illustrated by figure 3.1) and (ii) creation of large

\(^{49}\) It is not clear what exactly is included in this category, for example, whether educational and cultural buildings are included or not.
public liabilities for which local governments will be financially unprepared. Experts believe that assets’ useful lives can be shortened by 33 percent without proper investment in O&M, thus increasing long-term capital investment needs by one-third. Underinvestment in O&M can also lead to risks to public safety and an overall decline in the quality and quantity of service delivery.

**Figure 3.1 Example of Asphalt Road Depreciation**

![Asset Depreciation Diagram](source)

*Source: Drawn from Capital Investment Planning Guide for Ethiopian Cities, Ministry of Urban Development and Construction, 2011, p. 21.*

**Asset Age, Condition, and Underinvestment in O&M**

Future asset-related financial needs in each city depend on the age of the assets. Expensive maintenance and replacement work is required when a building reaches a certain age. Refurbishing building interiors may be required every 8 years; electrical systems need partial replacement every 10 years; and roofs need resurfacing or replacement every 30 years (Whitestone Research 2010). These costs also depend on asset conditions and how well they were maintained and repaired in the past (figure 3.1). Thus, it is crucial for cities to know the age and condition of their physical assets so that they can forecast future capital investment needs and plan corrective and preventive maintenance and repair.

Such data seems to be almost nonexistent in the selected cities. An exception is building stock data in Chengcheng, where the government has a list detailing the number of buildings with their age (figure 3.2), indicating that this stock is relatively young. The local government also believes that all of these buildings are in good condition, which was not possible to verify independently.\(^{50}\) The absence of data on initial costs or replacement costs for these buildings makes it impossible to estimate their O&M expenses according to international good practices.

\(^{50}\) It is not obvious that this is true, given chronic underinvestment in O&M.
The initial costs or replacement costs of infrastructure assets are usually not known, except for relatively new assets. Depreciation is not calculated for accounting purposes either. As a result, data for estimating required O&M expenses is lacking. However, an example from Laibin is instructive. The Guangxi Laibin Water Environment Project, which is being financed with World Bank assistance, had future O&M costs alone estimated as 3.19 percent of construction costs; together with depreciation costs, they were estimated at 5.2 percent of the construction cost. In terms of the city budget, this single project would add 0.5 percent to total city expenses annually (starting with the city’s budget for 2011).

Even the limited evidence available indicates that underinvestment in the costs of O&M and repair and replacement of existing assets is widespread and has four systemic causes. First, neither mandatory norms for planning O&M expenses nor local good practices of ad hoc planning exist; meanwhile, the norms occasionally used are too low when compared to international standards of good practice. Second, even these lower-than-needed O&M expenses are not always budgeted in practice, due to the shortage of funding and low pricing that does not fully recover costs of use or service delivery. Third, investment is focused on new assets and funding is insufficient for maintaining existing assets—a trend driven by a policy environment encouraging the spatial expansion of cities and short-term goal setting. Fourth, local infrastructure managers interviewed confirm that O&M costs for new fixed assets are usually unplanned due to high dependence of budgets on intergovernmental transfers. This results in additional pressure on municipal budgets and perpetual underinvestment in O&M.

From a technical viewpoint, it remains unclear how local governments estimate O&M needs in requests for budgetary funding for the succeeding year. A number of questions and issues still need to be explored including (i) whether O&M costs depend on specific infrastructure configuration

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51 Therefore, the accounting reform did not reach yet a stage of massive reevaluation of fixed assets, and it is not clear whether it is planned to make valuations of existing assets or, alternatively, only the value of new assets will be recorded on municipal balance sheets.
4. Conclusions and Recommendations

The findings of this paper underscore the fact that asset management is not yet recognized as an important and distinctive area of municipal management in China. The results of the survey are very similar in all three cities when scored against international good practice benchmarks: At 45–49 percent of the maximum score, there is a lot of room for improvement. Land is managed better than buildings and infrastructure, which is unusual by international standards, but not surprising in China given local governments’ reliance on land revenues for their budgets. Similar results could reasonably be expected to be found in most other small towns and cities in China, and overall may be applicable to large cities as well. This is typical of a pre-reform state and implies multiple inefficiencies and weaknesses.

The diagnostics reveal key vulnerabilities in terms of data availability and reporting, governance, capacity, and financial management. We observed: (i) a lack of periodic reporting on assets, even for decision makers, which results in decisions being made in the dark, without their implications being recognized or foreseen; (ii) extreme fragmentation of asset management functions in many cases, even for single asset classes (such as wastewater infrastructure) leading to multiple inefficiencies, including cost inefficiency;52 (iii) a lack of sufficient professional capacity for asset management, which is a highly technical area of knowledge and skills, and lack of adequate training opportunities, except for land managers; and (iv) poor financial management, signaling that the financial aspects of asset management are in an embryonic state. In particular, future asset-related expenses for buildings and infrastructure (for example, future O&M and capital costs) are not estimated and budgeted, and multi-year citywide capital investment planning does not exist.

Fast growth of all three cities (like other cities and towns in China) and large investments in new public infrastructure establishes large and growing, but unknown, expense liabilities for local governments. Even without considering debt repayment obligations, required O&M and depreciation expenses alone accumulate quickly and require city budgets to grow so as to cover expenses not covered by user fees. Hidden accumulation of future expense liabilities is further amplified because proper life-cycle management of buildings and infrastructure is not performed. In fact, estimates made with very limited data indicate that O&M expenses might be funded at 30–50 percent of the adequate level in the best case, and may be as low as 10 percent of what is required. This will lead to premature deterioration of assets and a need to replace them earlier than with reliable O&M funding, thus increasing future capital expenses. Insufficient spending on maintaining public buildings and infrastructure, if not rectified, will lead to increased risks to public safety and declining scope and quality of public services.

52 Addressing institutional fragmentation of asset management within each sector should be a part of broader sectoral reforms and proceeded by sector assessment that considers all aspects of service delivery (service scope and institutional, financial, and operational quality). Hence, the issue is broader than asset management and should be addressed in its entirety.
City budgets, with their current funding structure relying on intergovernmental transfers and land revenues, can be unsustainable—even without the additional demands posed by increasing O&M and depreciation costs. In some cities, a large and volatile share of the city budget comes from land concession sales, which is not a sustainable source of revenues given its finite nature. As result, a collision between increasing demands on municipal budgets (from growing portfolios of municipal capital assets) and declining budget revenues (from land sales) appears inevitable. This puts at risk the revenue sustainability of cities.

Given the current shift taking place with the introduction of China’s budget law toward increased transparency, accountability, and use of efficient, market-based principles, the time is ripe to actively define roles and responsibilities for municipal asset management. The lack of a budget for recurring costs will fundamentally impact the need for future transfers from central government. Until now lots of assets have been funded off-budget, but with the current reform process more assets can come from a clear source of financing and be on the local government’s balance sheets.

One crucial role central government plays in municipal asset management is providing country-level principles, policy and legislative framework. This translates into a central-level reform that explicitly defines what common standards local government should take and what rights local governments can have in regards to their public property. This “top-down and total system approach mandating change across government” is taken by best practice countries such as Australia, New Zealand and UK, where municipal asset management practice is practiced in a context of strong national government direction dating back to the 1980s. Actions in New Zealand and Canada included national-level reform in accounting standards for municipalities and creating clear and written rules that determine the categories of public assets and local governments’ relevant rights. These actions encourage municipalities to record and manage their assets and enable them to dispose surplus or unproductive assets and acquire new ones according to their needs (Kaganova and MeKellar 2006; Jamer 2015).

Another crucial role for central governments is to provide knowledge sharing and encourage transfer of good practices across the country. In U.K, the Department for Communities and Local Government commissioned an evaluation of local authorities practice in asset management and provide comprehensive guidance and case studies to cities (UK Department of Communities and Local Government, 2008). In a central authority led public asset management initiative, central government agencies provide guidance to lower level governments. This contrasts to a more property oriented approach adopted in U.S.A, where municipalities choose their practices according to their financial capacity and there are a variety of methods adopted locally. Large cities can afford to recruit executive talent from the private sector or establish special municipal asset management leadership, while others decide often to outsource expertise by hiring private sector consultants on an ad hoc basis (Kaganova and McKellar, 2006).

In practice, central governments may also bear responsibilities towards municipalities in terms of influence regarding bail-out principles and local finance regulation. Central governments sometimes could create an environment that tolerates or incentivizes municipal finance moral hazard and discourages municipalities to improve asset management practices. This occurs through decisions related to local debts’ impact on the domestic financial system. Municipalities
may become saddled with costly debt as a result. In China for instance, in 2015, local government debt has risen to more than 30% of GDP (Fortune, 2015).

The vanishing role of local government financing vehicles (LGFP) and declining land sales revenue, might trigger serious financing shortages, especially for smaller cities and towns. According to an IMF report on China’s local government financing platforms (Lu & Sun, 2013), while Chinese local governments have accessed and used LGFP to finance and restructure debt, in the medium term they may find this route to accessing financing is limited due to the new direction pointed out by the new State Budget Law. Hence it is increasingly important for the central government to provide policy guidance that encourage municipalities to establish a strategic approach to managing municipal assets and physical properties.

In all, modernization of asset management is a long-term process, and it requires leadership and consistent commitment. Lessons from other countries show that there is no single and universal path for modernizing asset management. Rather, improving asset management is a process that takes time. Thus, governments in China need to start acting now, before the risks become an immediate and clear danger to the sustainability of their cities.

The recommendations presented here focus on which improvements are needed over what time period (short, medium, or long term), and how to achieve them in a realistic way given the results of this assessment and lessons from international experiences with asset management modernization. They are addressed to the upper level governments who can facilitate and accelerate the modernization, and to local governments who can take practical actions toward improving the functioning of asset management operations.

**Recommendations for Central and Provincial Governments**

**R1. Set priorities for municipal asset management. Timing: short term.** Create policy consensus and define main goals of a municipal asset management system including: (i) providing local residents with improved services based on municipal asset use (such as infrastructure, water systems, parking etc.); (ii) increasing revenues; (iii) moving toward credit ratings for local governments; (iv) attracting more domestic and foreign investors; (v) improving land valuation and making land assets attractive for productive and real estate purposes; and (vi) enhancing the environment and improving the quality of life. An effective asset management system can provide useful information to city managers as well as other stakeholders regarding a city’s assets and their actual potential net worth.

**R2. Develop a toolkit for municipal asset management. Timing: short and medium term.** While specific cities or towns may focus on different elements of asset management, a unified guidance document is needed from which relevant sections can be chosen. Ideally, this document would be prepared by a select, interdisciplinary team of Chinese experts with the participation of international specialists familiar with good practice and lessons learned in countries where asset management reform has been recently tried and tested. The toolkit should include, but is not limited to, the following:

- Key elements of a rationalization of governance and institutional structure within the realm of asset management practices (besides broader sectoral reforms that may be needed);
• An asset classification system
• Technical parameters and definitions for an inventory (ideally in open software form, so it’s easy to transfer and update the data) of existing stock of assets including infrastructure, land, and buildings;
• A registration system for municipal assets and procedures and policies for its operation;
• Financial reporting requirements and methods for valuation and appraisal of existing stock of assets, particularly for less liquid assets;\(^{53}\)
• Parameters and standards for asset maintenance including calculation of O&M costs and incorporating O&M costs in recurrent budget preparation; and minimum requirements and standards for asset maintenance by class of assets;
• Administration and organizational arrangements for municipal asset management including ownership rights, uses and limitations, mandates and functions of an asset management office, key job descriptions, audit mechanisms; and processes and criteria for acquisition, rental, and sale of assets; and
• Technology for mapping, data gathering, and analysis of flows of people and transactions across function systems (assets, financial reporting etc.).

R3. Provide streamlined technical assistance to participating local governments. Timing: short and medium term. Based on the guidelines developed in R1, and following a diagnostic like the one carried out in the three selected cities, some streamlined and institutionalized technical assistance (TA) would be beneficial to local authorities. International experiences in the Balkans (Croatia, Serbia) demonstrate that, to have a lasting impact, a TA program on municipal asset management should continue for several years. The activities should be anchored to:

• Facilitating new processes, especially for citywide, cross-agency cooperation (for example, creation of an asset management task force, as suggested below);
• Providing technical expertise and guidance to facilitate new pilot activities (such as preparation of a multi-year capital investment plan); and
• Transferring general knowledge and expertise to local government staff and local private consultants.

Such assistance should be well coordinated with TA aimed at the reform of public accounting, municipal finance, municipal service delivery and infrastructure, and SOEs.

R4. Provide capacity building and training on asset management, on a rolling basis with increasingly meaningful content. Timing: short term. Since many practitioners are unaware of important elements of asset management, a training and capacity-building system should be developed. To produce significant results and establish a foundation for a sustainable approach, the system should focus on three distinct groups of trainees:

• **Local officials and technical staff.** An introductory training of two and a half to three days can be developed and tested with the participating cities as a follow-up to this assessment. The format should combine interactive training and workshops for brainstorming about how a city should proceed. Topics to be covered could include notions and definitions; why good asset management is important; links between asset management and financial management;

\(^{53}\) Accounting standards and practices (cash basis versus accrual accounting) determine when and how transactions and economic events are reflected in the financial statements. The World Bank is working with the Chinese Ministry of Finance on a separate technical assistance program to support the introduction of accrual based accounting.
good asset management practices and how to apply them; basics of system performance and portfolio performance; basics of life-cycle management and related practical techniques; and capital investment planning.

- **Local government officials and independent consultants** who could assist local governments. Establishing a technical training program with certification should be the first order of business if the development and sustainability of a cadre of asset management experts is a goal. This training can be initially one to two weeks long and then continued by learning-by-doing\(^\text{54}\).

- **Municipal asset management auditors**. Such training is important to improve the level of trust in public performance and service; it is mandated by law in most countries. The core structure of the audit can vary, but the fundamental purpose is to ensure the dissemination of and wide access to public information. Reporting can be directed to municipal and national authorities. However, training for the auditors can be carried out during the second wave of activities, that is, over the medium and long term.

| Box 4.1 Membership Organizations for Government Asset Managers: International Examples |
| --- |
| Membership organizations constitute a cornerstone of “professional infrastructure” for government asset managers and perform as the main engine for formulating and exchanging professional knowledge in their countries of origin. They also create networking opportunities for informal communication among members. |
| **The Canadian National Executive Forum on Public Property (NEFPP)** is a national non-profit organization for the advancement and sharing of best practices in public property and land management. Member organizations are public agencies with big property portfolios, including agencies from all major cities. Representatives are at the senior executive level in federal, provincial, and municipal departments, agencies, public utilities, crown corporations, and development corporations. The Forum launches member-driven research and surveys (for example, a benchmarking study on use of office space by member agencies) and organizes two conferences per year. (NEFPP 2013) |
| **The United Kingdom Asset Management Professional Network at the Chartered Institute of Public Finance and Accountancy (CIPFA)** is the professional body for people in public finance. Its property branch specializes in services for managers of public fixed assets including training courses, publications, guidance materials, benchmarking surveys of asset management practices, advisory services for local governments, conferences, and networking. (CIPFA Property 2012) |

To make these efforts sustainable, the training would need to be developed together with the development of for-profit and not-for-profit professional and educational organizations. A network

\(^{54}\) However, even a two-week training program is not sufficient for making people “experts.” To develop this expertise, it may be necessary to arrange for “apprenticeship” opportunities with international experts while they are in China. Another option is to introduce a cost-sharing program between WB and participating cities after local people have received some training: The trained consultants will be co-funded by WB and cities themselves while they assist those cities on improving AM. The Urban Institute (Washington, DC) had such a program in Croatia in the early 2000s, and it was a real success. Private consulting practices have been established and are thriving in several areas of municipal management, including AM. The trained consultants have expanded their business to assisting central government agencies domestically and abroad.
of such organizations is indispensable for providing municipal staff with opportunities for continuing professional development. Besides, international experiences show that membership organizations for government staff engaged in asset management are a highly appreciated and effective form of knowledge generation and exchange (see Box 4.1).

**R5. Create incentives for local governments and within local governments to improve asset management. Timing: short and medium term.** In the past, the performance of local government leaders was incentivized through promotions based on reaching GDP targets. National government has recognized that new incentives are needed to re-orient local officials toward longer-term financial planning and sustainability targets. An integral part of this should be better municipal asset management. Other countries, including Canada and the United Kingdom as well as some local jurisdictions in the United States, have successfully introduced incentives to improve asset management (see box 4.2). These incentives can be established by the central government (as in the case of the United Kingdom) or by local governments within their own jurisdictions (as in the case of the Montgomery County, Maryland in the United States).55

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**Box 4.2 Incentives for Better Asset Management: International Examples**

**Canada—Incentives for federal government agencies:** The Treasury Board of Canada introduced a new policy that provided incentives for disposing of underused and surplus properties held by federal agencies and for improving asset management practices. Property holders obtained the right to retain all net revenues from selling surplus properties if they complied with three conditions: (i) the agency developed a strategic investment framework, including a long-term capital investment plan, approved by the Treasury Board; (ii) the sale proceeds were reinvested in the agency’s other properties, consistent with the strategic framework; and (iii) the agency met reporting requirements regarding the submission of data on the disposed property to the database of federal property (McKellar 2006).

**United Kingdom—Incentives for local governments:** In early 2000, the United Kingdom introduced a “single pot” concept in which a single grant would cover four key services (education, housing, transportation and personal social services). Eighty percent of the total amount would be allocated by a need-based formula. However, the other 20 percent would be discretion-based and incentive-linked. This portion would be allocated if a local government demonstrated a good corporate strategy for capital investment and had a credible asset management plan (Audit Commission 2000).

**Montgomery County (Maryland, United States)—Cost-cutting incentives for staff:** In the wake of the 2009–2012 public finance crisis, Montgomery County introduced monetary incentives for its staff. If a staff member or team identified how to save on O&M costs of the county’s assets without jeopardizing service quality and asset condition and their proposal was approved and materialized real savings, a share of these savings would be paid to the authors of the saving proposal. Creative thinking among staff led to multiple cost-savings solutions, from maintenance of the bus fleet to rationalization of operation of the air-conditioning system at the Grosvenor performing arts center (Laris 2011).

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55 The Research Institute for Fiscal Science has already been working on this topic, and published a paper on government asset management at the International Public Procurement Conference 4 in 2010.
R6. Consider establishing an advisory body at the national level (inside or outside central government, with the latter a preferred option) to facilitate development of an asset management methodology. **Timing: medium term.** Its role would be to support better asset management at the local government level through a multitude of activities, such as commissioning research, surveying practices, and preparing case studies; developing guidelines and methodologies; facilitating dissemination of good practices; and providing a forum for knowledge and experience exchange among practitioners. However, at this time it is **not advisable** to create any new central government entity in China with the power of issuing asset management directives mandatory for local governments, given that the Ministry of Finance has the responsibility of guiding the asset management modernization. A department within MoF, such as the Asset Management Department, could potentially be the right organization to take the lead, if it could be assigned a broader mandate. It would be important to allocate clear responsibility for this task to a specific unit and to provide necessary technical guidance and support to staff to advance this agenda.

**Recommendations for Local Governments**

R7. Establish a temporary inter-agency asset management task force in each participating town or city. **Timing: short term.** Such an inter-agency task force is a first step toward breaking away from fragmentation in vision and practices within the town or city. It could also serve as a “think tank” where experts from different bureaus and SOEs would together have the knowledge and capacity to come up with solutions that none of them separately would be able to suggest and implement. Many cities including the city of Portland, Oregon (United States) have addressed this issue in a similar fashion (see box B.1). The task force needs to act under the auspices of high-level leadership and include representatives of all major holders of municipal capital assets and entities responsible for implementing asset management activities and policies. The chairman of the task force should be the most senior person in the local government who is ultimately responsible for all asset management. At the current initial stage, creating any new bureau, SOE, or agency for asset management is **not advisable**. The task force's purpose would be (i) to identify the nature of current asset management practices in the city based on the initial findings of this report, then (ii) to set up priorities in the town for addressing crucial issues, and finally (iii) to implement an action plan as well as the national guidelines (see R1). Over the medium to long term, the functions performed by the task force should be institutionalized according to recommendations and consensus developed within the task force itself.

R8. Diagnose the status of asset management systems and portfolios on a rolling basis. **Timing: short and medium term.** Cities have limited resources, so they need an objective diagnostic of which elements of asset management need improvement the most. The special assessment survey that was tested in in the three cities produces scorecards measuring asset management system performance that would be a good instrument for use by any city. In particular, it identifies elements of asset management that are in a bad shape (“on red”) and thus may need attention sooner than other elements, which are at a more advanced stage.

R9. Develop and start implementing a practical action plan tailored to a specific city or town and local sense of priorities. **(Short - mid-term.)** Based on the scorecard, identify which elements of asset management should be improved first and then develop a realistic action plan for implementation, including baseline information and readiness of the inventory system. It is
advisable that this action plan is worked on and presented to the city leadership by the interdisciplinary task force (see R6). After the action plan is validated by city’s leadership, the Task Force would also be a vehicle facilitate plan’s implementation. The action plan should be aligned with the relevant national guidelines as and when those are issued. See Annex 1 for detailed city recommendations based on the scorecards and in-depth assessment.

**R10. Improve information sharing within local government, including through the preparation of reports on asset management. Timing: short, medium, and long term.** It is essential to initiate asset information sharing, coordination, and integration across different asset users and custodians. Achieving this should be among the top tasks of the task force. Additionally, while cooperation and sharing of information can be facilitated by investments in information and communications technology (ICT), the corporate culture within government should gradually change as well. For example, it would not take much effort to introduce, as a short-term task, a requirement to prepare and publish periodic (annually or every few years) specialized reports on “the state of the estate”\(^\text{56}\) for buildings, land, and infrastructure systems.\(^\text{57}\) The content of the reports would evolve and improve over time and could eventually adhere to national guidelines.

**R11. Initiate improvements in the financial aspects of asset management as a top priority and continue them on a rolling basis. Timing: short and medium term.** The lack of proper planning and budgeting of asset-related expenses constitutes a systemic risk for the fiscal stability of cities and their ability to deliver services to citizens. Therefore, addressing these issues has to be among the top priorities for local governments. This is at least a three-part task:

- **Planning and budgeting proper O&M expenses for buildings and infrastructure.** For overcoming the current practices of substantial underinvestment in existing fixed assets and absence of even basic elements of life-cycle costing, there should be (i) proper policy, (ii) adequate technical norms, and (iii) matching budgetary resources. The first two conditions can be addressed if political will exists, preferably facilitated by proper incentives. However, the third condition goes well beyond the realm of asset management itself and belongs to municipal finance reform.

- **Introducing new, explicit asset management policies.** Many issues cannot be addressed by technical improvements alone and require, first of all, explicit policy reform. Such a policy for example, could establish that taking proper care of operations, maintenance, repair (including capital repair), and replacement of existing public buildings and infrastructure for main public services should take priority over investment in territorial expansion or building new facilities beyond the scope of main services.

- **Modernize the process of capital investment planning by introducing multi-year capital investment plans (CIP).**\(^\text{58}\)Expanding the time horizon for financial planning from the current one-year paradigm to longer-term thinking, planning, and budgeting would be an important element of a practical transition to a long-term financial mentality. One may expect that Chinese cities would face two main challenges to introducing CIP: first, finding how to consolidate a fragmented annual decision-making process for selecting projects for capital investment and

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\(^{56}\) The term used in the United Kingdom reports.

\(^{57}\) As the score cards indicated, none of the pilot cities publish such reports. Moreover, in most cases and for most types of assets, such reports are not prepared even for decision makers.

\(^{58}\) The methodology recommended by the World Bank is published as *Guidebook on Capital Investment Planning for Local Governments* (2011), which has been also reprinted in Chinese in 2012.
transforming it into something based on more transparent criteria; and, second, combining this new, better organized process of project selection with a similarly consolidated process of assembling finance for these projects. Experience of Ulaanbaatar, Mongolia, suggests that the first task can be addressed more easily than the second task (see box 4.3). Bigger cities in China with a higher current share of their own-source revenues, such as Laibin, could be more able to transition to multi-year planning than small county towns like Linshui and Chengcheng.

Box 4.3 Ulaanbaatar, Mongolia: Introducing the First Modern Capital Investment Plan (CIP)

In 2014, Ulaanbaatar started developing its first modernized, multi-year capital investment plan. A special CIP Committee selected the following criteria, also approved by city management, for evaluating and ranking potential projects:

Table B4.3.1 Criteria for Evaluating and Ranking Potential Projects

| No | Criterion                                                                 | Maximum evaluation in points |
|----|---------------------------------------------------------------------------|------------------------------|
| 1  | Project was started in a previous year or included in a previous year’s CIP | 20                           |
| 2  | Project provides an important health or safety benefit                      | 10                           |
| 3  | Project provides an important school or kindergarten benefit to a neighborhood | 5                            |
| 4  | Project is a necessary repair or replacement of existing capital equipment or facility | 15                          |
| 5  | Project advances objective #_________ from Mayor’s 3-year Operation Program  | 10                           |
| 6  | Project cost will be offset by operating cost savings or increased revenues | 10                           |
| 7  | Number of benefiting neighborhoods                                          | 10                           |
| 8  | How important the project is for the submitting entity (district, agency, etc.) | 20                           |
|    | TOTAL points                                                               | 100                          |

It is important to note that capital repair and replacement receives a 15-point advantage over new investment. Prioritizing projects according to this approach progressed successfully, but there was no coordination with identification of sources of finance, indicating that fragmentation inside the city government continued. Moreover, due to an unexpected rift between the city government and the central government at the last moment before approval of the city budget, the overall process of finalizing the new CIP was not completed in 2014.

(Aide-Memoire 2014)

R12. Specifically for Linshui, Chengcheng, and Laibin: Start addressing the weaknesses identified in the scorecards and sharing positive experiences on a rolling basis. Timing: short term. The leadership and technical staff of Linshui, Chengcheng, and Laibin can take advantage of the fact that the scorecards are already prepared, so they can act upon them. For example, the leadership can:
Establish requirements for main government agencies and SOEs to report regularly on fixed assets, with content valuable for decision makers. If such data and information doesn’t fully exist, asset managers should be made responsible for accumulating useful and computerized data. The cities also need to avoid the trap of collecting data without knowing for what it will be used. The task force, by collaborating with the city leadership, could be very instrumental in suggesting which inventory and financial data is the most important at the first stage.

Re-orient officers with asset management responsibilities toward expanding their knowledge and analysis into financial aspects and risk management, so that the leadership and decision makers start having a picture of what is happening, citywide. Critical issues must be addressed in a credible and verifiable way, including estimates of O&M needed to maintain assets in operating shape and the gap between this and what is currently spent for this purpose; critical components and minimum requirements for maintenance of adequate service delivery and to minimize risk for citizens; and the age of assets and forecasts of potential upkeep costs for the next 10 years.

Seek agreement from government to launch pilot testing to introduce a process of full-cycle asset management matched with multi-year capital investment planning, citywide (or at least including several sectors).

Compare and contrast their scorecard with the other cities (and the help of technical experts) and ask their counterparts how exactly they handle issues on which their city scored better, moving towards more peer-to-peer learning. For example: Linshui and Laibin might ask Chengcheng to see its report to decision makers on buildings and decide whether they want to adopt its content for themselves. Linshui and Chengcheng might be interested to see what and how Laibin reports to the public about land. Linshui and Chengcheng might ask Laibin how it monitors and records O&M costs for each building. Chengcheng and Laibin may want to know how Linshui almost always projects its long-term investment needs for the storm drainage system, solid waste management, and streets and roads.

**R13. Start introducing and using key performance indicators for municipal asset management. Timing: short and medium term.** For monitoring and measuring progress over time, introducing key performance indicators (KPIs) would be invaluable. This would be consistent with a worldwide trend in asset management. It is important to be realistic and start with simple and basic indicators initially. Two types of indicators seem relevant. The first would be the scorecard indicators, calculated once a year, to monitor progress since the previous round. Changes in scorecard indicators would show whether improvements were made in those practices that the task force identified as the top priority. However, the scorecard indicators deliberately offer only rough measures of achieving good practice benchmarks (see Methodology section 1.3). The second type would be a more precise set of indicators that may be needed to measure operational improvements for some selected practices.  

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For example, the assessment survey underlying the scorecard has rough ranges for the indicator on completion of inventorying, such as “no inventory exists (less than 5 percent of buildings inventoried),” and “on early stages (between 5 percent and 50 percent of buildings inventoried”), etc. Meanwhile the task force may need to assess the process with a more precise indicator, such as “the number of buildings inventoried by the end of the year” and “percentage of total building number inventoried by the end of the year,” so that year-on-year progress with inventorying can be measured more accurately.
R14. Introduce other measures to improve financial performance of municipal fixed assets. 

**Timing: medium to long term.** Measures that promise tangible savings and other improvements can be incorporated into action plans developed by local task forces and include the following:

- Screening government-use and public-use buildings systematically for opportunities to generate additional revenues and reduce operating expenses through better use of space, energy efficiency, and operating efficiency. An effective incentive to motivate asset management and building management staff to come up with creative ideas could be monetary awards (as some percentage of the realized savings or revenues), similar to a program in Montgomery County, Maryland, United States (see Box 4.2).
- Linking spatial development planning with cost assessment for such plans. In particular, introduce mandatory revenue and cost assessment for territorial development and redevelopment plans, similar to that used in Poland, described in box 4.4. This would be a very important step toward spatial efficiency, which, in turn, is critical for the long-term sustainability of any city or town.

**Box 4.4 Poland: Linking Spatial Urban Planning with Public Financial Planning**

The **Financial Impact Study (FIS)** in Poland coordinates views of urban planners with the realities of municipal finance and interests of the private sector. This must be done before a land development plan (LDP) can be approved. A simple calculation in the FIS produces estimated expected land-related revenues from the area covered by the LDP and public expenses related to its implementation. The following items can be found in the FIS:

| Types of Revenue | Expenditures |
|------------------|--------------|
| Property tax     | Construction of streets / roads |
| Perpetual usufruct fee | Sewage mains |
| Planning gain    | Water mains |
| Betterment fee   | Purchases of the private lands to build the above infrastructure |

Based on the results of the FIS, urban planners can reduce the length and characteristics of streets, if the expenditure side seems too high compared to revenues, for example.

A modification of this model could be applied in China by revising the structure of revenues and including expected revenues from land concession sales. This could be developed as a spreadsheet for considering various costs and revenue scenarios depending on land uses and their parameters, such as width of streets, percentage of land reserved for public uses, floor-to-area ratio (FAR), land coverage, etc. It could also be used by urban planners, financial planners, and decision makers, for linking spatial planning with municipal financial planning. In particular, the model would enable decision makers to have some ideas on how spatial plans translate into expected public costs and revenues.

(Kaganova & Buczek 2010)

- Streamlining government property holdings by privatizing surplus properties and reducing the list of SOEs to those that perform truly public functions.

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60 Usufruct as referred to in Box 4.2 refers to the legal right of using and enjoying the fruits or profits of something belonging to another.
- Rethinking a strategy of land management and spatial growth. This would have a critical impact on city and town sustainability in the long term. Such a strategy might include components to improve management of land concessions and leases; increasingly sophisticated spatial planning to introduce more humanly attractive scale, increase density of land uses, and increase livability of the city or town; and enhanced approaches to location of territorial growth and to scale of redevelopment on existing urban territories to increase spatial sustainability and diversity of the urban fabric. For example, consider what will happen to the housing in older parts of cities or towns that people have improved. Will it be demolished and replaced at high social and financial costs by new large-scale high-rise development? Will it be incorporated in a more complex, diverse, and inclusive urban environment that integrates different periods of time and history? After numerous cycles of trial and error in many countries, planners, researchers, and politicians have arrived at mutual agreement that policies of inclusion work better.
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### Appendix: Scorecards for Three Cities Together

#### Part 1: Buildings (or Parts of Buildings if Separate Properties)

| Question No. | Characteristic of the Good Practices | Linshui | Chengcheng | Laibin | Maximum Score Possible |
|--------------|-------------------------------------|---------|------------|--------|------------------------|
| Q2           | Inventory of buildings and parts of buildings, level of completion | 1.00 | 0.33 | 1.00 | 1                      |
| Q3           | Level of inventory computerization | 1.00 | 1.00 | 1.00 | 1                      |
| Q4           | Breadth of inventory information | 0.44 | 0.31 | 0.56 | 1                      |
| Q5           | Existence of specialized asset management classification of buildings and parts of buildings | 1.00 | 0.33 | 0.00 | 1                      |
| Q6           | Existence of regulations requiring market valuation of buildings and parts of buildings before transactions with them | 1.00 | 1.00 | 1.00 | 1                      |
| Q7A          | Use of market valuation of buildings and parts of buildings in practice, for decision making | 0.50 | 0.75 | 0.00 | 1                      |
| Q7B          | Use of market value (or market rent) of buildings and parts of buildings in practice, in transactions | 1.00 | 1.00 | 0.00 | 1                      |
| Q8           | Transparency of documents and procedures related to buildings and parts of buildings | 0.50 | 0.35 | 0.70 | 1                      |
| Q9           | Transparency of transactions with buildings and parts of buildings | 0.92 | 0.08 | 0.96 | 1                      |
| Q10          | Periodic reporting to decision makers on building assets | 0.00 | 1.00 | 0.00 | 1                      |
| Q11          | Periodic reporting to the public on building assets | 0.00 | 0.00 | 0.00 | 1                      |
| Q12          | Use of auctions for allocating municipal buildings / parts of buildings to the private sector | 1.00 | 1.00 | 0.00 | 1                      |
| Q13          | Regulation on using revenues from the transfer of buildings / parts of buildings for capital investment or debt repayment | 0.00 | 0.00 | 1.00 | 1                      |
| Q14          | Practice of using revenues from the transfer of buildings / parts of buildings for capital investment or debt repayment | 0.00 | 0.00 | 0.00 | 1                      |

#### Basic Asset Management, Subtotal Score (Q2 - Q14)

| Linear Score | Chengcheng | Laibin | Total Score (Basic Asset Management) |
|--------------|------------|--------|-------------------------------------|
| 8.35         | 7.16       | 6.22   | 21.73                               |

#### Advanced Asset Management

| Question No. | Characteristic of the Good Practices | Linshui | Chengcheng | Laibin | Maximum Score Possible |
|--------------|-------------------------------------|---------|------------|--------|------------------------|
| Q15          | Established responsibility for a common city-wide framework for and approaches to management of buildings (parts of buildings) | 1.00 | 1.00 | 1.00 | 1                      |
| Q16          | Existence of strategic asset management plan (SAMP) or a similar specialized strategic document covering buildings | 0.00 | 0.00 | 0.00 | 1                      |
| Q17          | Training and professional development opportunities for staff working on asset management of buildings (parts of buildings) | 0.50 | 0.50 | 0.00 | 1                      |
| Q18          | Use of proactive maintenance / preventive repair plans and schedules for buildings (parts of buildings) | 0.00 | 0.33 | 0.33 | 1                      |
| Q19          | Use of condition records about buildings (parts of buildings) for repair and replacement planning | 0.00 | 0.00 | 0.33 | 1                      |
| Q20          | Updating the condition records | 0.33 | 0.00 | 0.67 | 1                      |
| Q21          | Monitoring and recording annual operations and maintenance (O&M) costs for each building (part of buildings) | 0.00 | 0.00 | 1.00 | 1                      |
| Q22          | Use of norms and standards for service provision and service levels for planning building needs | 1.00 | 1.00 | 1.00 | 1                      |
| Q23          | Projecting long-term investment needs for main building groups | 0.50 | 0.00 | 0.00 | 1                      |
| Q24          | Existence of government-wide multi-year capital investment plan (as a part of the budgeting system) that covers buildings or parts of buildings | 0.00 | 0.00 | 0.00 | 1                      |
| Q25          | Considering future life-cycle costs while planning technical solutions for capital investment in particular buildings | 0.00 | 0.00 | 0.50 | 1                      |
| Q26          | Assessing impact of future operations and maintenance (O&M) costs resulting from planned capital investment on the future operating budget | 0.00 | 0.00 | 0.50 | 1                      |
| Q27          | Existence of special protected funds or accounts for accumulating funding for buildings’ capital repair and replacement | 0.33 | 0.33 | 0.00 | 1                      |

#### Advanced Asset Management, Subtotal Score (Q15 - Q27)

| Linear Score | Chengcheng | Laibin | Total Score (Advanced Asset Management) |
|--------------|------------|--------|----------------------------------------|
| 3.66         | 3.16       | 5.33   | 12.15                                  |

#### Total Score

| Linear Score | Chengcheng | Laibin | Total Score |
|--------------|------------|--------|-------------|
| 12.01        | 10.32      | 11.55  | 27          |

| Questions Without Responses | Total | Chengcheng | Laibin |
|-----------------------------|-------|------------|--------|
|                            | 2.00  | 0.00       | 2.00   |
| Question No. | Characteristic of the Good Practices                                      | Linshui | Chengcheng | Laibin | Maximum Score Possible |
|-------------|-------------------------------------------------------------------------|---------|------------|--------|------------------------|
| Q2          | Inventory of land, level of completion                                   | 1.00    | 1.00       | 0.50   | 1                      |
| Q3          | Level of inventory computerization                                       | 1.00    | 1.00       | 0.50   | 1                      |
| Q4          | Existence of specialized asset management classification of land         | 1.00    | 0.67       | 0.00   | 1                      |
| Q5          | Existence of regulations requiring market valuation of land before transactions with it | 1.00    | 1.00       | 1.00   | 1                      |
| Q6A         | Use of market valuation of land in practice, for decision making        | 0.50    | 0.67       | 0.92   | 1                      |
| Q6B         | Use of market value (or market rent) of land in practice, in transactions | 1.00    | 1.00       | 0.00   | 1                      |
| Q7          | Transparency of documents and procedures related to land                 | 0.77    | 0.60       | 0.50   | 1                      |
| Q8          | Transparency of transactions with land                                   | 0.83    | 0.92       | 0.92   | 1                      |
| Q9          | Periodic reporting to decision makers on land                           | 0.00    | 1.00       | 1.00   | 1                      |
| Q10         | Periodic reporting to the public on land                                | 0.00    | 0.00       | 1.00   | 1                      |
| Q11         | Use of auctions for allocating land to the private sector                | 1.00    | 1.00       | 1.00   | 1                      |
| Q12         | Regulation on using revenues from the transfer of land for capital investment or debt repayment | 0.00    | 1.00       | 1.00   | 1                      |
| Q13         | Practice of using revenues from the transfer of land for capital investment or debt repayment | 0.00    | 1.00       | 0.00   | 1                      |
| Q14         | Responsibility for establishing a common city-wide framework for and approaches to management of land | 1.00    | 1.00       | 1.00   | 1                      |
| Q15         | Existence of strategic asset management plan (SAMP) or a similar specialized strategic document covering land | 0.00    | 0.00       | 0.00   | 1                      |
| Q16         | Training and professional development opportunities for staff working on asset management of land | 0.50    | 0.50       | 1.00   | 1                      |
|             | **Total Score**                                                          | **9.60**| **12.35**  | **10.33**| **16**                 |

**Questions Without Responses:** 2
## Part 3: Infrastructure

| Question No. | Characteristic of the Good Practices | Linshui | Chengcheng | Laibin | Maximum Score Possible |
|--------------|-------------------------------------|---------|------------|--------|------------------------|
| Q2           | Number of infrastructure systems under local government ownership and control (non-scoring characteristic) | 5.00    | 6.00       | 7.00   | -                      |
| Q3           | Inventory of infrastructure, level of completion | 0.74    | 0.56       | 0.33   | 1                      |
| S1           | WATER SYSTEMS | 0.67    | 0.67       | 0.33   | 1                      |
| S2           | WASTEWATER SYSTEMS | 0.67    | 0.67       | 0.67   | 1                      |
| S3           | STORM DRAINAGE SYSTEMS | 0.67    | 0.33       | 0.33   | 1                      |
| S4           | SOLID WASTE COLLECTION & DISPOSAL FACILITIES | 0.67    | 0.67       | 0.33   | 1                      |
| S5           | PARKS & PUBLIC SPACES | 0.67    | 0.33       | 0.00   | 1                      |
| S6           | CEMETERIES | 0.00    | 0.00       |        | 0.00                   |
| S7           | STREETS AND ROADS | 1.00    | 0.67       | 0.67   | 1                      |
| S8           | POWER GENERATION AND DISTRIBUTION SYSTEMS | 0.00    | 0.00       | 0.00   | 1                      |
| S9           | OTHER (specify) | 0.00    | 0.00       | 0.00   | 1                      |
| Q4           | Level of inventory computerization | 0.30    | 0.50       | 0.43   | 1                      |
| S1           | WATER SYSTEMS | 0.50    | 0.50       | 0.50   | 1                      |
| S2           | WASTEWATER SYSTEMS | 0.50    | 0.50       | 0.50   | 1                      |
| S3           | STORM DRAINAGE SYSTEMS | 0.00    | 0.50       | 0.50   | 1                      |
| S4           | SOLID WASTE COLLECTION & DISPOSAL FACILITIES | 0.00    | 0.50       | 0.50   | 1                      |
| S5           | PARKS & PUBLIC SPACES | 0.00    | 0.50       | 0.00   | 1                      |
| S6           | CEMETERIES | 0.00    | 0.00       | 0.00   | 1                      |
| S7           | STREETS AND ROADS | 1.00    | 0.50       | 1.00   | 1                      |
| S8           | POWER GENERATION AND DISTRIBUTION SYSTEMS | 0.00    | 0.00       | 0.00   | 1                      |
| S9           | OTHER (specify) | 0.00    | 0.00       | 0.00   | 1                      |
| Q5           | Periodic reporting to decision makers on infrastructure | 0.00    | 0.00       | 0.00   | 1                      |
| Q6           | Periodic reporting to the public on infrastructure | 0.00    | 0.00       | 0.00   | 1                      |

### Basic Asset Management, Subtotal Score (Q3- Q6)

| Question No. | Characteristic of the Good Practices | Linshui | Chengcheng | Laibin |
|--------------|-------------------------------------|---------|------------|--------|
| Q7           | Established responsibility for a common city-wide framework for and approaches to management of infrastructure | 0.33    | 1.00       | 0.00   |
| Q8           | Existence of Strategic Asset Management Plan (SAMP) or a similar specialized strategic document covering infrastructure | 0.00    | 0.00       | 0.00   |
| Q9           | Training and professional development opportunities for staff working on asset management of infrastructure | 0.50    | 0.50       | 0.50   |
| Q10          | Use of proactive maintenance / preventive repair plans and schedules for infrastructure | 0.53    | 0.50       | 0.67   |
| S1           | WATER SYSTEMS | 0.33    | 1.00       | 0.00   |
| S2           | WASTEWATER SYSTEMS | 0.67    | 0.33       | 1.00   |
| S3           | STORM DRAINAGE SYSTEMS | 0.33    | 0.67       | 0.33   |
| S4           | SOLID WASTE COLLECTION & DISPOSAL FACILITIES | 0.00    | 0.67       | 1.00   |
| S5           | PARKS & PUBLIC SPACES | 1.00    | 0.33       | 1.00   |
| S6           | CEMETERIES | 0.00    | 0.00       | 0.00   |
| S7           | STREETS AND ROADS | 0.67    | 0.67       | 0.33   |
| S8           | POWER GENERATION AND DISTRIBUTION SYSTEMS | 0.00    | 0.00       | 0.00   |
| S9           | OTHER (specify) | 0.00    | 0.00       | 0.00   |
| Q11          | Use of condition records about infrastructure for repair and replacement planning | 0.80    | 0.56       | 0.48   |
| S1           | WATER SYSTEMS | 0.67    | 1.00       | 0.00   |
| S2           | WASTEWATER SYSTEMS | 0.67    | 0.33       | 1.00   |
| S3           | STORM DRAINAGE SYSTEMS | 0.67    | 0.67       | 0.33   |
| S4           | SOLID WASTE COLLECTION & DISPOSAL FACILITIES | 1.00    | 0.67       | 0.67   |
| S5           | PARKS & PUBLIC SPACES | 0.67    | 0.33       | 0.00   |
| S6           | CEMETERIES | 0.00    | 0.00       | 0.00   |
| S7           | STREETS AND ROADS | 1.00    | 0.67       | 0.33   |
| S8           | POWER GENERATION AND DISTRIBUTION SYSTEMS | 0.00    | 0.00       | 0.00   |
| S9           | OTHER (specify) | 0.00    | 0.00       | 0.00   |

### Advanced Asset Management

| Question No. | Characteristic of the Good Practices | Linshui | Chengcheng | Laibin |
|--------------|-------------------------------------|---------|------------|--------|
| Q7           | Established responsibility for a common city-wide framework for and approaches to management of infrastructure | 0.33    | 1.00       | 0.00   |
| Q8           | Existence of Strategic Asset Management Plan (SAMP) or a similar specialized strategic document covering infrastructure | 0.00    | 0.00       | 0.00   |
| Q9           | Training and professional development opportunities for staff working on asset management of infrastructure | 0.50    | 0.50       | 0.50   |
| Q10          | Use of proactive maintenance / preventive repair plans and schedules for infrastructure | 0.53    | 0.50       | 0.67   |
| S1           | WATER SYSTEMS | 0.33    | 1.00       | 0.00   |
| S2           | WASTEWATER SYSTEMS | 0.67    | 0.33       | 1.00   |
| S3           | STORM DRAINAGE SYSTEMS | 0.33    | 0.67       | 0.33   |
| S4           | SOLID WASTE COLLECTION & DISPOSAL FACILITIES | 0.00    | 0.67       | 1.00   |
| S5           | PARKS & PUBLIC SPACES | 1.00    | 0.33       | 1.00   |
| S6           | CEMETERIES | 0.00    | 0.00       | 0.00   |
| S7           | STREETS AND ROADS | 0.67    | 0.67       | 0.33   |
| S8           | POWER GENERATION AND DISTRIBUTION SYSTEMS | 0.00    | 0.00       | 0.00   |
| S9           | OTHER (specify) | 0.00    | 0.00       | 0.00   |
| Q11          | Use of condition records about infrastructure for repair and replacement planning | 0.80    | 0.56       | 0.48   |
| S1           | WATER SYSTEMS | 0.67    | 1.00       | 0.00   |
| S2           | WASTEWATER SYSTEMS | 0.67    | 0.33       | 1.00   |
| S3           | STORM DRAINAGE SYSTEMS | 0.67    | 0.67       | 0.33   |
| S4           | SOLID WASTE COLLECTION & DISPOSAL FACILITIES | 1.00    | 0.67       | 0.67   |
| S5           | PARKS & PUBLIC SPACES | 0.67    | 0.33       | 0.00   |
| S6           | CEMETERIES | 0.00    | 0.00       | 0.00   |
| S7           | STREETS AND ROADS | 1.00    | 0.67       | 0.33   |
| S8           | POWER GENERATION AND DISTRIBUTION SYSTEMS | 0.00    | 0.00       | 0.00   |
| S9           | OTHER (specify) | 0.00    | 0.00       | 0.00   |
| Q12 | Updating the condition records | 0.61 | 0.89 | 0.38 | 1 |
|-----|--------------------------------|------|------|------|---|
| S1  | WATER SYSTEMS                 |      |      |      |   |
| S2  | WASTEWATER SYSTEMS            | 0.67 | 0.33 | 0.67 | 1 |
| S3  | STORM DRAINAGE SYSTEMS        | 0.67 | 1.00 | 0.33 | 1 |
| S4  | SOLID WASTE COLLECTION & DISPOSAL FACILITIES | 1.00 | 1.00 | 0.33 | 1 |
| S5  | PARKS & PUBLIC SPACES         | 0.33 | 0.67 | 0.33 | 1 |
| S6  | CEMETARIES                    |      |      |      |   |
| S7  | STREETS AND ROADS             | 0.33 | 1.00 | 0.33 | 1 |
| S8  | POWER GENERATION AND DISTRIBUTION SYSTEMS | | | | |
| S9  | OTHER (specify)               |      |      |      |   |
| Q13 | Monitoring and recording annual operations and maintenance (O&M) costs for infrastructure | 0.80 | 0.50 | 0.33 | 1 |
| S1  | WATER SYSTEMS                 |      |      |      |   |
| S2  | WASTEWATER SYSTEMS            | 0.67 | 0.33 | 1.00 | 1 |
| S3  | STORM DRAINAGE SYSTEMS        | 0.67 | 0.33 | 0.33 | 1 |
| S4  | SOLID WASTE COLLECTION & DISPOSAL FACILITIES | 1.00 | 0.67 | 0.33 | 1 |
| S5  | PARKS & PUBLIC SPACES         | 0.67 | 0.33 | 0.67 | 1 |
| S6  | CEMETARIES                    |      |      |      |   |
| S7  | STREETS AND ROADS             | 1.00 | 0.67 | 0.67 | 1 |
| S8  | POWER GENERATION AND DISTRIBUTION SYSTEMS | | | | |
| S9  | OTHER (specify)               |      |      |      |   |
| Q14 | Use of norms and standards for service provision and service levels for planning infrastructure needs | 1.00 | 1.00 | 1.00 | 1 |
| Q15 | Projecting long-term investment needs for infrastructure | 0.70 | 0.00 | 0.07 | 1 |
| S1  | WATER SYSTEMS                 |      |      |      |   |
| S2  | WASTEWATER SYSTEMS            | 0.50 | 0.00 | 0.00 | 1 |
| S3  | STORM DRAINAGE SYSTEMS        | 1.00 | 0.00 | 0.00 | 1 |
| S4  | SOLID WASTE COLLECTION & DISPOSAL FACILITIES | 1.00 | 0.00 | 0.00 | 1 |
| S5  | PARKS & PUBLIC SPACES         | 0.00 | 0.00 | 0.50 | 1 |
| S6  | CEMETARIES                    |      |      |      |   |
| S7  | STREETS AND ROADS             | 1.00 | 0.00 | 0.00 | 1 |
| S8  | POWER GENERATION AND DISTRIBUTION SYSTEMS | | | | |
| S9  | OTHER (specify)               |      |      |      |   |
| Q16 | Existence of government-wide multi-year capital investment plan (as a part of the budgeting system) that covers infrastructure | 0.00 | 0.00 | 0.00 | 1 |
| Q17 | Considering future life-cycle costs while planning technical solutions for capital investment in infrastructure | 0.50 | 0.50 | 0.50 | 1 |
| Q18 | Assessing impact of future operations and maintenance (O&M) costs resulting from planned capital investment on the future operating budget | 0.00 | 0.50 | 0.50 | 1 |
| Q19 | Existence of special protected funds or accounts for accumulating funding for infrastructure capital repair and replacement | 0.67 | 0.00 | 0.00 | 1 |

**Advanced Asset Management, Subtotal Score (Q7 - Q19)**

|                          | 6.44 | 5.95 | 4.43 | 13 |

**Total Score**

|                          | 7.47 | 7.00 | 5.19 | 17 |

**Questions Without Responses**

|                          | 2.29 |      |      |    |

**TOTAL SCORE FOR PART 1 - PART 3**

|                          | 29.09 | 29.67 | 27.07 | 60 |

**Total number of questions without responses**

|                          | 6.29 |      |      |    |