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ORIGINAL ARTICLE

Municipal asset management in China's small cities and towns: Findings and strategies ahead

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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 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 the 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 upper and lower levels of government, to advance local asset management practices and facilitate the reform agenda.

Keywords: *asset management; municipal assets; small cities and towns; China; benchmarking assessment*

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[1] 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.

1. 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 to acquire.

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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 and 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 taxes to increase public revenues. Studies have suggested that one of the main drivers 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[2] under the ownership and management of local governments and their state-owned enterprises (SOEs). These include three major categories: buildings, land, and municipal infrastructure.[3]

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 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, 2014).

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 Table 1). 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.

2. Fixed assets for the purposes of this report are buildings and infrastructure, that is, roads, bridges, water systems, utilities, housing, hospitals, schools, parks, *etc*.

3. 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.

The land use plan allocates land slots among competing projects, subject to the aggregate land supply quota.

Table 1. Overview of China's planning and budgeting process

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 and 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

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; and (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.[4]

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. 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.[5]

Linshui County is administratively under the prefecture-level city of Guang'an in eastern Sichuan province,[6] 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 RMB18.07 billion, and total fixed asset investment was RMB16.22 billion.[7]

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

4. Given the increasing importance of successful municipal asset management in future urban sustainability and municipal finance initiatives, the World 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 World Bank's China portfolio. It is hoped that these good practices will eventually be shared with other cities and towns. In parallel, other World 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*.

5. The average per capita income of urban residents in the three towns in 2014 ranged from RMB23,703 to RMB27,374 (rural resident income ranged from RMB7,691 to RMB9,365). In comparison, the average per capita income in China was RMB28,844 in 2014.

6. A prefectural level city is often not a "city" in the usual sense of the term (*i.e.*, a large continuous urban settlement), but instead an administrative unit comprising a main central urban area (the city) and a larger surrounding rural area containing many smaller cities, towns, and villages.

7. http://www.scls.gov.cn/E_ReadNews.asp?NewsID=10480

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 was RMB8.53 billion, up 10 percent from 2013, and total fixed asset investment was RMB14.13 billion.[8]

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 SAR, China; Macau; and Guangzhou. In 2014, the total GDP of Laibin was RMB55.1 billion.[9]

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 SOEs: 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 levels.

The diagnostic tool was developed and deployed in the form of a survey of key aspects of municipal asset management.[10] The tool combines several important elements: it defines a set of characteristics, based on international good practices,[11] that include knowing what assets you have (inventorying), why the assets are needed (classification), and what the market value of the capital assets (for good decision making and transactions) is. 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.[12] This converts qualitative answers to

8. http://www.weinan.gov.cn/gk/gzbg/zfgzbg/xzfgzbg/448557.htm

9. http://www.laibin.gov.cn/LBFront/zwgk/20150316/003016_16e0462c-56cd-436c-b566-c64bc566becb.htm

10. It was developed by the National Opinion Research Center (NORC) at the University of Chicago.

11. They were selected after an extensive study and comparison of good practices in countries and cities recognized for their advancement in asset management, in particular, Australia, Canada, continental Europe, the United Kingdom, and some cities in the United States.

12. 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.

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 carry the risk of underestimating or overestimating resource requirements.[13] 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.

2.2 Review of literature and international best practices

The development of conceptual frameworks for government asset management originated during the 1980–1990s 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 *et al*., 2006) and in reaction to the privatization of former public utilities (Institute for Water Resources, 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 (Institute of Asset Management, 2014).

International frameworks were developed to facilitate the implementation of good municipal asset management by providing checklists of elements and implementation guidance[14]. For instance, one widely used framework 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.

13. 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.

14. 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.

Two main concepts are embedded in these standards. First, good asset management should be strategic, systematic, and fact-based. 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 differences in institutional contexts, good asset management practices 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 *et al*., 2006).

- Good inventory. Asset management begins with the establishment of a comprehensive and updated inventory and rational classification. 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 (Ibid). In Canada, similarly, cities that adopt Public Sector Accounting Board (PSAB) 3150 need to conduct initial valuation of all municipal tangible capital assets and record comprehensive information on their asset portfolio, its value and its remaining useful life. This information 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 is crucial to maximize extraction of value from assets and deliver cost-effective public services. 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. 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.[15]

- 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

15. 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.

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 (City of Portland, 2009; 2014).

- 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 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. 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 Global Institute, 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. It is estimated that if US$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 Global Institute, 2013).

  Additionally, major repair and replacement costs for municipal assets must be planned and accounted for along with general maintenance. This is exemplified by Tokyo, which accumulates special funds for future asset replacement costs of schools and water utilities (Suzuki *et al*., 2010). 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 Global Institute, 2013). 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 (Dow *et al*., 2006).

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 2, the cities are roughly within the 45–49 percent range of the international benchmark for good practices (see detailed results in the Appendix).

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.

Table 2. Performance of asset management systems in three cities.[16] City and town performance as percent of international benchmark

	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.[17] 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%) than for buildings (38 to 44%) and infrastructure (31 to 44%). 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.[18] However, this result is consistent with the importance of land in China as a source of local revenues.

16. This shows performance as of April 15, 2015, the deadline for the survey submission to build the scorecard.

17. The reason is likely 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.

18. 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.

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.[19] 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 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 that the selected cities have not reached yet. Further, as described below, financial management and planning is underdeveloped in these cities.

3.2 Asset portfolios

Three cities own and control diverse properties (as shown in Table 3), but inadequate inventory is identified across all categories of assets. First, the cities hold large stock of buildings, recently built or under completion, 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 (m2), and with the construction cost of public buildings in Chengcheng being approximately RMB1,300 per m2, the replacement value of this portfolio at least RMB745.3 million (US$118.3 million).

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.

19. These results are directly from what the authorities reported in the survey. However, the data on prices for industrial land allocated in Linshui show that the price was fixed at a low-level (see Table A2.1–2.6 in Appendix 2) during 2010–2014. In Chengcheng, it remained nearly the same during the same period. This indicates that industrial land perhaps was not 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 and Development Research Center, 2014).

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.

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.

Table 3. Main types of assets by category

Asset category	Main types (portfolios) of assets
Buildings	Office buildings for administrative use Apartments[20] 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 Land for new urbanization, constantly expropriated and converted from rural to urban
Infrastructure	Water supply systems[21] Wastewater collection and treatment plants Storm drainage systems Solid waste collection and disposal Streets and roads Parks and public spaces Cemeteries (in Laibin only)[22]

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. 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

20. Local governments have a mandate to provide housing for low-income families.

21.The water supply system in Linshui is not controlled by the county, but rather by Sichuan Linshui AAA Public Water Co. Ltd., which is owned by the prefectural-level city Guang'an.

22. In Linshui and Chengcheng, cemeteries are privately owned or operated.

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.[23]

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 results in the lack of an entity with overall responsibility for running the wastewater system (planning, financing, operating), including frontline responsibility for industrial discharges.[24] 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.[25] 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,[26] 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 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 O&M costs, and considerable losses in revenues. The lack of information sharing and integration has resulted in incomplete basic inventory data on local

23. 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.

24. In Linshui Town, the O&M 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 m^3/day WWTP No.3 and the associated sewage pipelines and treated effluent pipeline.

25. See example of wastewater management in France (Salvetti and Canneva, 2014).

26. When municipal governments face fiscal constraints, many choose not to fully fund the operation, maintenance, and timely renewal of the wastewater networks (Browder, 2007).

holdings.[27] Such data would be an extremely useful tool for better informed and modern policy and government decision making.

3.4 Governance

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.

3.5 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 classes. Sales of land concessions (mainly converted from rural to urban) have constituted an important source of net revenues for local governments over the past 15 years in China. Public buildings and most forms of infrastructure do not generate revenue but rather constitute "cost centers" for local governments. Even if these assets sometimes generate revenues (for example, 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.

There are 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. One reason for this is that the data on land concession revenue are provided by the land bureau, whereas the land income within the non-fiscal revenue is calculated by the finance bureau, and their methodologies differ.[28] 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. These data, while overstating absolute amounts of the land revenues (as compared to data showing revenue actually collected), are still useful for

27. One example is the case of Linshui, where the Asset Management Registration System contains some data, albeit limited, partial and inconsistent.

28. 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.

understanding other features, such as volatility, and for identifying the maximum that the land could generate in a particular year.

3.5.1 Land concession revenues

The share of land concession revenues to total revenues varies from city to city. However, high volatility of land concession revenues is consistenly observed in three counties (see tables in Appendix 2). 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 decline in land revenues from 2011 to 2012. This may indicate that an unavoidable decline in land concession revenues is beginning.[29]

Sustainability is a serious concern: one-time revenues from a finite resource such as 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.[30]

3.5.2 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.[31] However, this subject is beyond the immediate scope of this report even though it is relevant for Linshui, Chengcheng, and Laibin.

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.

29. 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 Hsing (2010).

30. The instability of this revenue source is magnified, as already mentioned, by the fact that within existing practices, land concession revenues are collected up-front entirely or in a substantial share.

31. In particular, some of their SOEs have substantial debt compared to their assets.

3.5.3 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.

3.5.4 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.[32] In turn, this implies annual O&M costs, even if accumulation of recapitalization funding is not done. Within good practices, O&M costs need to be estimated and predicted.

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 4 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.

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 (Kaganova and Windolph, 2012). During

32. "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.

2012–2014, the city administration in Chengcheng allocated a constant 1.2 percent of the total city expenditures for O&M for office buildings.[33] While this resulted in the amount increasing annually, given that the city budget was increasing, it does not imply these were sufficient amounts.

Table 4. Annual asset-related expenses in Linshui and Chengcheng as compared to international guidelines

Type of expenditure	**Amount allocated for public buildings and pipeline networks in Linshui and Chengcheng, as % of initial capital cost[34]**	**Amount required for public buildings according to international good practice, as % of the replacement cost[35]**	**Amount required for pipeline networks according to international good practice, as % of the replacement cost[36]**
O&M	1% (in the best case)	6.8%	1%–3%
Accumulated depreciation	For minority of buildings only; the amount is unknown	2.4% to 2.9%	Partly included in the above %

While having sufficient reserve funds is considered to be the best international practice, the three counties 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.

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 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.

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 1) and (ii) creation of large public

33. It is not clear what exactly is included in this category, for example, whether educational and cultural buildings are included or not.

34. 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.

35. 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 those 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).

36. The "replacement cost" is the international terminology and approach that reflects inflation over time (NORC, 2013).

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.

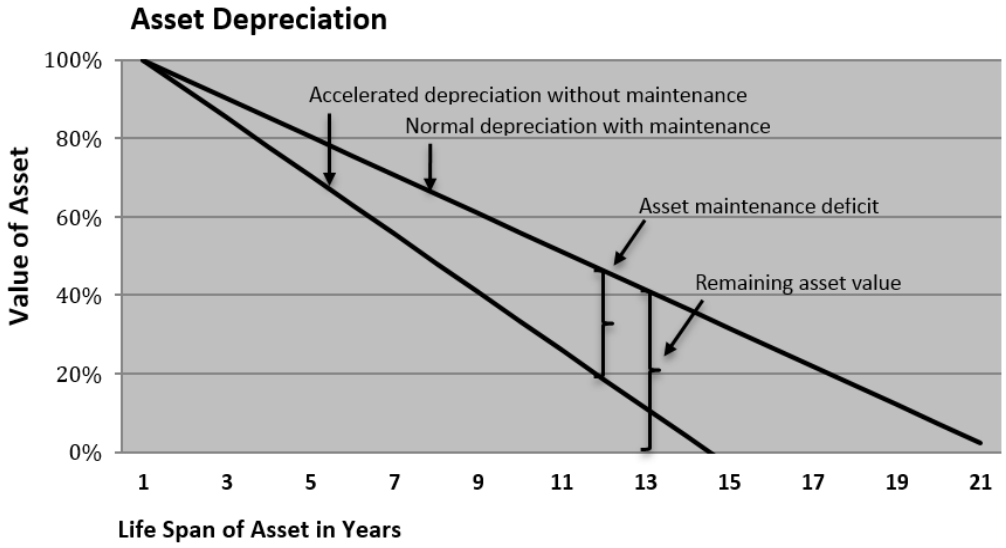

Figure 1. Example of asphalt road depreciation

Source: Redrawn from "Capital investment planning guide for Ethiopian cities", Ministry of Urban Development and Construction (2011), p. 21

3.5.5 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 (Lufkin *et al*., 2010). These costs also depend on asset conditions and how well they were maintained and repaired in the past (Figure 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 seem 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 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.[37]

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.[38] As a result, data for estimating required O&M expenses are lacking. However, an example from Laibin is

37. It is not obvious that this is true, given the chronic underinvestment in O&M.

38. 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.

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).

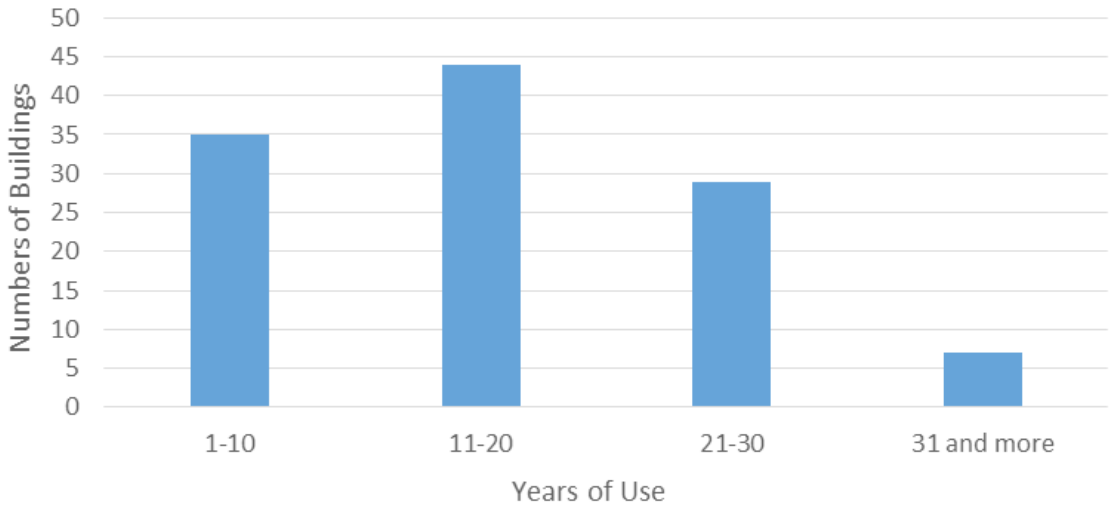

Figure 2. Distribution of 115 public buildings in Chengcheng by age
Source: Chart generated by the World Bank team based on data provided by Chengcheng County Government

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, interviewed local infrastructure managers confirmed 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 (NORC, 2013); (ii) whether O&M requested funds depend on the actual condition of assets; (iii) the size of O&M estimated needs calculated by local technical experts at various levels of local government and the share actually funded; and (iv) the methodology for estimation of O&M budget requests (based on previous years' requests).

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;[39] (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.

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.

39. 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.

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 "top-down and total system approach mandating change across government" is taken by best practice countries. 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 *et al*, 2006; Jamer, 2015). Central governments can also provide knowledge sharing and encourage transfer of good practices across the country. In the UK, the Department for Communities and Local Government (2008) commissioned an evaluation of local authorities practice in asset management and provide comprehensive guidance and case studies to local governments. This contrasts to a more property-oriented approach adopted in the USA, where municipalities choose their practices according to their financial capacity and there are a variety of methods adopted locally.

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 (Cendrowski, 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 (Lu and 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 encourages 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.

4.1 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 is 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.[40]
- 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.

40. 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.

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).
- 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 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. 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: why good asset management is important and its financial implications; best 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. 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.[41]
- 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.

41.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.

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 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.[42]

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. Other countries have successfully introduced incentives to improve asset management, either established by the central government or by local governments within their own jurisdictions.[43]

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. It can support local governments in 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.

4.2 Recommendations for local governments

R7) Establish a temporary inter-agency asset management task force in each participating town or city to address issues identified in this report. Timing: short term. This 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. 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

42. See examples of the Canadian National Executive Forum on Public Property (http://www.publicpropertyforum.ca/program-activities.htm) and UK Asset Management Professional Network at the Chartered Institute of Public Finance and Accountancy (CIPFA Property, 2012).

43. Successful examples include: (1) Canada allows federal government agencies to retain all net revenues from selling surplus properties if they comply with certain good asset management practices (McKellar, 2006); (2) UK introduced a "single grant" of which 20 percent is incentive-linked and would be allocated if a local government has a good capital investment strategy and a credible asset management plan (Audit Commission, 2000); (3) Montgomery County (Maryland, United States) rewarded staff/team, who identified O&M cost-saving strategy without jeopardizing service quality or asset conditions, a share of these savings (Laris, 2011).

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.

R8) Diagnose the status of asset management systems and portfolios on a rolling basis. Timing: short and medium term. 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. Timing: short to medium 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 inter-disciplinary 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.

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"[44] for buildings, land, and infrastructure systems.[45] 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. 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.

44. The term used in the United Kingdom reports.

45. 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.

- 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).[46] 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 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. 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 such as Linshui and Chengcheng.

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:

- 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 does not 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 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; 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 their scorecard with the other cities (and the help of technical experts), ask their counterparts how exactly they handle issues on which their city scored better, and decide

46. The methodology recommended by the World Bank is published as Guidebook on Capital Investment Planning for Local Governments (Kaganova, 2011), which has been also reprinted in Chinese in 2013.

whether they want to adopt the practices themselves, moving towards more peer-to-peer learning.

R13) Start introducing and using key performance indicators (KPIs) for municipal asset management. Timing: short and medium term. For monitoring and measuring progress over time, introducing 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 2.1). The second type would be a more precise set of indicators that may be needed to measure operational improvements for some selected practices.[47]

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).
- Linking spatial development planning with cost assessment for such plans. In particular, introduce mandatory revenue and cost assessment for territorial development and redevelopment plans.[48] 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.
- Streamlining government property holdings by privatizing surplus properties and reducing the list of SOEs to those that perform truly public functions.
- Rethinking a strategy of land management and spatial growth. 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.

47. 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.

48. 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.

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Appendix

Appendix 1. Scorecards for three cities together

Part 1: Buildings (or Parts of Buildings if Separate Properties)		**Linshui**	**Chengcheng**	**Laibin**	
Question No.	**Characteristic of the Good Practices**	**Score (for quantitative indicators the score approximates estimated actual levels)**			**Maximum Score Possible**
Basic Asset Management					
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)		***8.35***	***7.16***	***6.22***	***14***

Appendix 1. Continued.

Advanced Asset Management					
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)		***3.66***	***3.16***	***5.33***	***13***
	Total Score	**12.01**	**10.32**	**11.55**	**27**
	Questions Without Responses			**2**	

Part 2: Land		**Linshui**	**Chengcheng**	**Laibin**	
Question No.	**Characteristic of the Good Practices**	**Score (for quantitative indicators, the score approximates estimated actual levels)**			**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**	

Appendix 1. Continued.

Part 3: Infrastructure		**Linshui**	**Chengcheng**	**Laibin**	
Question No.	**Characteristic of the Good Practices**	**Score (for quantitative indicators, the score approximates estimated actual levels)**			**Maximum Score Possible**
Basic Asset Management					
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	*CEMETARIES*			*0.00*	
S7	*STREETS AND ROADS*	*1.00*	*0.67*	*0.67*	*1*
S8	*POWER GENERATION AND DISTRIBUTION SYSTEMS*				
S9	*OTHER (specify)*				
Q4	Level of inventory computerization	0.30	0.50	0.43	1
S1	*WATER SYSTEMS*		*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	*CEMETARIES*			*0.00*	
S7	*STREETS AND ROADS*	*1.00*	*0.50*	*1.00*	*1*
S8	*POWER GENERATION AND DISTRIBUTION SYSTEMS*				
S9	*OTHER (specify)*				
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)		***1.04***	***1.06***	***0.76***	***4***
Advanced Asset Management					
Q7	Established responsibility for a common city-wide framework for and approaches to management of infrastructure	0.33	1.00	0.00	1
Q8	Existence of Strategic Asset Management Plan (SAMP) or a similar specialized strategic document covering infrastructure	0.00	0.00	0.00	1
Q9	Training and professional development opportunities for staff working on asset management of infrastructure	0.50	0.50	0.50	1
Q10	Use of proactive maintenance / preventive repair plans and schedules for infrastructure	0.53	0.50	0.67	1
S1	*WATER SYSTEMS*		*0.33*	*1.00*	*1*
S2	*WASTEWATER SYSTEMS*	*0.67*	*0.33*	*1.00*	*1*
S3	*STORM DRAINAGE SYSTEMS*	*0.33*	*0.67*	*0.33*	*1*
S4	*SOLID WASTE COLLECTION & DISPOSAL FACILITIES*	*0.00*	*0.67*	*1.00*	*1*
S5	*PARKS & PUBLIC SPACES*	*1.00*	*0.33*	*1.00*	*1*
S6	*CEMETARIES*			*0.00*	
S7	*STREETS AND ROADS*	*0.67*	*0.67*	*0.33*	*1*
S8	*POWER GENERATION AND DISTRIBUTION SYSTEMS*				
S9	*OTHER (specify)*				
Q11	Use of condition records about infrastructure for repair and replacement planning	0.80	0.56	0.48	1
S1	*WATER SYSTEMS*		*0.67*	*1.00*	*1*
S2	*WASTEWATER SYSTEMS*	*0.67*	*0.33*	*1.00*	*1*
S3	*STORM DRAINAGE SYSTEMS*	*0.67*	*0.67*	*0.33*	*1*
S4	*SOLID WASTE COLLECTION & DISPOSAL FACILITIES*	*1.00*	*0.67*	*0.67*	*1*
S5	*PARKS & PUBLIC SPACES*	*0.67*	*0.33*	*0.00*	*1*
S6	*CEMETARIES*			*0.00*	
S7	*STREETS AND ROADS*	*1.00*	*0.67*	*0.33*	*1*
S8	*POWER GENERATION AND DISTRIBUTION SYSTEMS*				
S9	*OTHER (specify)*				

Appendix 1. Continued.

Q12	Updating the condition records	0.61	0.89	0.38	1
S1	*WATER SYSTEMS*		*1.00*	*0.67*	*1*
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*			*0.00*	
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*		*0.67*	*0.00*	*1*
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*	*0.00*	*1*
S6	*CEMETARIES*			*0.00*	
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*		*0.00*	*0.00*	*1*
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*			*0.00*	
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**	

Table A2.1 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 A2.2 Linshui land concession revenue, 2010–2014

Item/Year	2010	2011	2012	2013	2014
Commercial and residential land area	568	161	494	378	26
Commercial and residential land price (10,000 RMB/mu)	77	119	164	238	70
Industrial land area sold (mu)	144	404	481	868	135
Industrial land price (10,000 RMB /mu)	6	6	6	6	6
Aggregate land concession revenue (RMB million)	443	214	837	949	25.8

Source: Data provided by Linshui County Government

Table A2.3 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 A2.4 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

Table A2.5 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: Kaganova and Windolph (2012)

Table A2.6 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: Kaganova and Windolph (2012)
Note: 1 mu = 0.16 acre = 0.06 ha