

## SECTOR ASSESSMENT (SUMMARY): MULTISECTOR<sup>1</sup>

### A. Sector Road Map

#### 1. Sector Performance, Problems, and Opportunities

1. Following the implementation of reforms and accelerated industrialization in the People's Republic of China (PRC), economic and urban growth have been rapid. During 1978–2013, the urban population increased from 170 million to 730 million, and the urbanization rate increased from 17.9% to 53.7%. The National Urbanization Strategy (2014–2020) and the PRC's Twelfth Five-Year Plan indicate that urban development should continue, with the urbanization rate reaching 60% by 2020 (equivalent to 100 million new urban residents) and 70% by 2030 (300 million new urban residents).<sup>2</sup> Urbanization is perceived as a main driving force in the effort to shift the economy from investment and exports to demand-driven, service-oriented growth. The National Urbanization Strategy and Twelfth Five-Year Plan also highlight the importance of quality in urbanization—in addition to accommodating the urban population, infrastructure should promote quality urbanization and best practices in municipal services to ensure urbanization is people-centered and resource efficient. However, this requires adequate financing for infrastructure investment and knowhow to manage services.<sup>3</sup>

2. From a spatial planning perspective, efforts to promote development of medium-sized cities are central to the PRC's urbanization strategy.<sup>4</sup> Mega cities and metropolitan clusters are a powerful economic driving force, but face increasing environmental and congestion challenges, which lead to significant territorial disparities, and exacerbate inequality. In response, the government has developed objectives and measures to decrease pressure on large cities, and encourage rural migration to smaller cities.<sup>5</sup> Medium-sized cities account for one-third of the urban population, and have the potential to cluster economic activity, act as a vital link to remote areas, attract the local rural work force, and strengthen urban–rural integration. However, many cities in less-developed regions lack adequate infrastructure and have difficulty accessing adequate investment, resulting in (i) environmental pollution, (ii) constrained economic development, and (iii) the inability to effectively absorb rural surplus labor flows. The livability and resource efficiency of future urban development in the PRC will depend on improvements to medium-sized cities. Pilot projects for improved urban management have the potential to change perceptions and demonstrate how best practices can be adapted and applied to cities of this size.

3. **Regional context.** Jilin Province is located in the middle of the PRC's northeastern region, which includes Liaoning and Heilongjiang provinces. The region was one of the country's main heavy industrial bases during 1950–1980. The implementation of economic reforms in the PRC resulted in the bankruptcy of many state-owned enterprises, which caused

<sup>1</sup> ADB. 2010. *People's Republic of China: Country Partnership Strategy (2011-2015)*. Manila.

<sup>2</sup> State Council of the PRC. 2014. *National Urbanization Strategy (2014–2020)*. Beijing; State Council of the PRC. 2011. *People's Republic of China Twelfth Five-Year Plan for National Economic and Social Development (2011–2015)*. Beijing.

<sup>3</sup> Required investment in infrastructure to support urban services is estimated to total \$3.8 trillion during 2014–2020.

<sup>4</sup> In the Tenth Five-Year Plan (2001–2005), urban development policy emphasized balanced development of cities (big, medium, and small) and towns; the Eleventh Five-Year Plan (2006–2010) emphasized development of metropolitan regions, while the Twelfth Five-Year Plan (2011–2015) prioritizes development of small and medium-sized cities for regional advantage and stronger resource and environmental capacity.

<sup>5</sup> On 15 November 2013, the Central Committee of the Communist Party of China indicated urbanization and *hukou* (household registration) system reform should focus on small and medium-sized cities, while migration to big cities should be controlled.

huge economic losses in the region. The PRC state council initiated a strategy to promote regional economic development by revitalizing the old northeastern industrial base.<sup>6</sup> In 2012, Jilin Province's gross domestic product has subsequently reached CNY1.2 billion, with an annual growth rate of 13%. However, the province's economic growth is concentrated in the cities of Changchun (the provincial capital) and Jilin. The per capita disposable income in 2012 is CNY17,800, which ranks 23rd in the PRC and is below the national average of CNY21,800. The poverty rate is high in the rural prefectures in the eastern and western fringes, which lag behind economically. The Jilin provincial government's sustainable economic and social development strategy calls for the population to increase from 15 million to around 30 million in 2020, with the urbanization rate increasing from 50% to 60%. The strategy seeks to sustain the development and integration of Changchun and Jilin cities as the main economic driving force, with the western and eastern fringes developed along a strategic corridor, and demographic pressure on rural land decreased through movement of population to local urban areas.

4. Baicheng (population 330,000) and Baishan (population 480,000) are two prefecture capitals identified as key urban centers to develop the poor and remote southeast and northwest provincial fringes.<sup>7</sup> They are important in balancing provincial development and providing job opportunities for the surrounding population. Baishan was identified as a demonstration city for economic transformation and resource efficiency, while Baicheng is an important transport and logistical center in the northeast PRC. Two major transport infrastructure projects—the Changchun–Baicheng high-speed railway and Baishan–Changchun Expressway—are under construction and will support development of the two cities. Responding to urgent infrastructure needs, the project will provide new approaches and policy frameworks for piloting urban transport, municipal solid waste, and water management solutions adapted to medium-sized cities.

## 2. Government's Sector Strategy

5. **Solid waste.** Since 2000, significant improvements have been made in the collection, transfer, treatment, and disposal of municipal solid waste in larger cities in the PRC, and subsequently in waste recycling initiatives. In contrast, small and medium-sized cities continue to rely on inefficient “truck and dump” operations, obsolete treatment facilities, and limited disposal options.<sup>8</sup> Implementing environmentally compliant solutions that are sustainable over the long term is a major challenge for these cities. Solid waste management systems need to be improved using a plan that defines comprehensive solutions for each waste type, and considers local conditions and population size. The Twelfth Five-Year Plan aims to (i) develop a pilot or model prefecture-level city in each province for classified collection, improved transport, and treatment of organic waste; and (ii) encourage classification of household garbage as wet or dry, and separate recycling of organic waste.

6. Those objectives are fully in line with the international waste hierarchy approach,<sup>9</sup> and Asian Development Bank (ADB) solid waste management principles. Lessons from urban solid waste management development demonstrate that investment must be comprehensive, integrated, and sequential, in what is typically referred to as integrated solid waste

<sup>6</sup> State Council of the PRC. 2009. *Strategy of Revitalization of Northeastern Old Industrial Base*. Beijing.

<sup>7</sup> Forecasts for 2020 estimate Baicheng City will grow to 600,000 people, and Baishan City to 700,000.

<sup>8</sup> In 2010, the PRC's landfill method of municipal solid waste disposal accounted for about 80% of waste; incineration for 15%; and composting for 2%.

<sup>9</sup> This involves reducing the amount and toxicity of material entering the waste flow (minimization), reusing as much material as practicable, recycling waste that cannot be used, recovering resources, and disposing of residue and/or rejects in an environmentally sound manner.

management.<sup>10</sup> Improvement in segregation at source, public education, and recycling behavior are key activities to optimize management of each waste stream. Improvements should therefore be gradual, ideally focusing on selected communities and combined with public awareness and education programs to change knowledge and behavior, mentalities and demonstrate the feasibility of the process.

7. To promote waste recycling and reuse, the two cities will gradually introduce garbage classification using a two-bin system that separates organic domestic waste; this will be implemented in select residential communities.<sup>11</sup> Collection points will accept recyclable items (e.g., paper, plastic, glass, clothes) that will be sent to recycle stations scattered in the urban area (these are privately operated businesses).<sup>12</sup> Organic waste will be collected and transported to a sorting and composting center, and reused for city landscaping. Construction waste recycling machines will be procured to reuse construction waste as construction backfill, landfill site soil cover, and for other construction uses. In addition to these investments the project will implement education and public awareness campaigns and community-based solid waste management to ensure the operation and sustainable impact of the infrastructure improvements.<sup>13</sup>

8. **Transport infrastructure.** Inadequate attention has been given to transport infrastructure during the PRC's rapid urban development. Problems exist at all stages—planning, engineering design and construction, and management and maintenance. Common problems include inadequate facilities for public and non-motorized transport, poor traffic management and traffic safety, inadequate infrastructure management and maintenance, and inadequate education programs and public awareness. Urban road safety can be improved by implementing three interrelated principles: (i) engineering design to increase road safety; (ii) education to increase safety awareness among drivers and the public; and (iii) enforcement of traffic regulations and laws. Improved non-motorized and public transport should be incorporated within the overall approach to urban planning and transport.

9. The project will focus on strategic road segments, which will provide adequate urban services to the existing population, facilitate the development of mixed-function areas to accommodate future residents and economic activities, and increase connectivity and synergy with other parts of the city. The transport infrastructure component is designed to promote people-oriented transport and will implement (i) intelligent transportation system traffic management and control that integrates traffic management, operation and dispatch management, travel information services, safety emergency response, and other functions; (ii) bus and non-motorized transport priority lanes built along selected project roads. The bus priority lanes will illustrate the effectiveness of the public bus system and help the municipal government implement additional public bus priority lanes and other public transport facilities;

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<sup>10</sup> Integrated solid waste management comprises integration of (i) stakeholders; (ii) technical elements of waste prevention, reuse and recycling, collection, and disposal; and (iii) sociocultural, environmental, institutional, political, and legal issues.

<sup>11</sup> Selection of communities for at-source segregation of organic and other recyclable waste will take into account technical and operational aspects and (i) even distribution across the project area; (ii) the presence of a suitable road network for special waste vehicles; and (iii) community management quality, to ensure successful operation and simplify the transfer of the at-source segregation process to other communities. At least 20% of the selected communities will be low income.

<sup>12</sup> Waste materials such as glass, waste paper, and plastic are recycled by the private sector. For example, collected paper waste will be recycled by the Hebei or Tianjin mills, plastic will go to Hebei Province, white bottle glass will be recycled in Harbin City, and green bottle glass in Siping City in Jilin Province.

<sup>13</sup> A long-term plan for integrated solid waste management in the two cities is in the project administration manual (PAM), accessible from the list of linked documents in Appendix 2 of the main text.

and (iii) traffic safety. The project team will work with Baicheng municipal government on land use improvements, including urban planning and zoning, to promote transport-oriented development by increasing density along main road sections, especially those with a dedicated bus line. Pedestrian and bicycle traffic will be promoted through protected and dedicated bicycle lanes, appropriate sidewalks, mid-block crossings, and pedestrian signals, along with measure to increase the safety of mixed urban traffic.<sup>14</sup>

10. **Water supply.** Inadequate water supply facilities contribute to low water supply coverage, excessive energy consumption, poor drinking water quality, and non-revenue water (NRW) losses in many areas of the PRC, including Baishan City. Previous low technical standards, aging of pipeline networks, and the current poor efficiency of water supply dispatching cause NRW losses in Baishan of up to 65%; this results in inefficient water use, high water tariffs and excess energy consumption. Groundwater resources is polluted and the quality of treated water often does not meet drinking water standards. With urban growth, the existing water supply capacity cannot meet current water demand. Through construction and upgrading of water supply distribution pipelines, installation of water meters, procurement of water pipeline leakage detection and repair equipment, development of water supply monitoring centers, promotion of public awareness of water conservation, and adoption of improved pump systems, the project will achieve significant water savings (an estimated 35% reduction in NRW loss) and energy savings, and reduce greenhouse gas emissions. The water supply component will greatly impact the overall financial sustainability of the water scheme.

11. Recent concerns have been raised regarding water quality in the PRC, with studies suggesting that nearly 50% of drinking water is unsafe for consumption. The project will support service providers in supplying safe drinking water through water quality monitoring and assurance systems, and thereby avoid the limitations associated with relying on end-product testing as a means of water safety control.<sup>15</sup> The project will identify risks and control measures along the water supply system (from water source to point of use), and will help define actions and investments to guarantee that the water quality meets the PRC's Drinking Water Quality Standard (GB5479-2006).<sup>16</sup>

### 3. ADB Sector Experience and Assistance Program

12. ADB urban sector development assistance has been effective in addressing a range of urban environmental problems that have a positive impact on water resources, pollution control, and public health. Since 1992, ADB has provided over 39 loans totaling \$4.5 billion to the PRC for urban environmental improvement and infrastructure projects. The loans have financed water supply, wastewater treatment, urban transport, flood control, solid waste management, and central heating in cities across the PRC. In recent years, ADB's urban sector assistance has focused on less-developed central, western, and northeastern regions, and supported new urban infrastructure and rehabilitation or extension of existing infrastructure to promote stronger environmental management and stimulate economic growth. Experience suggests that project investments are effective when they are a part of well-conceived, broader urban development plans and approaches, and when such support is accompanied by capacity building to strengthen urban management and public awareness on key issues such as road safety and the environment.

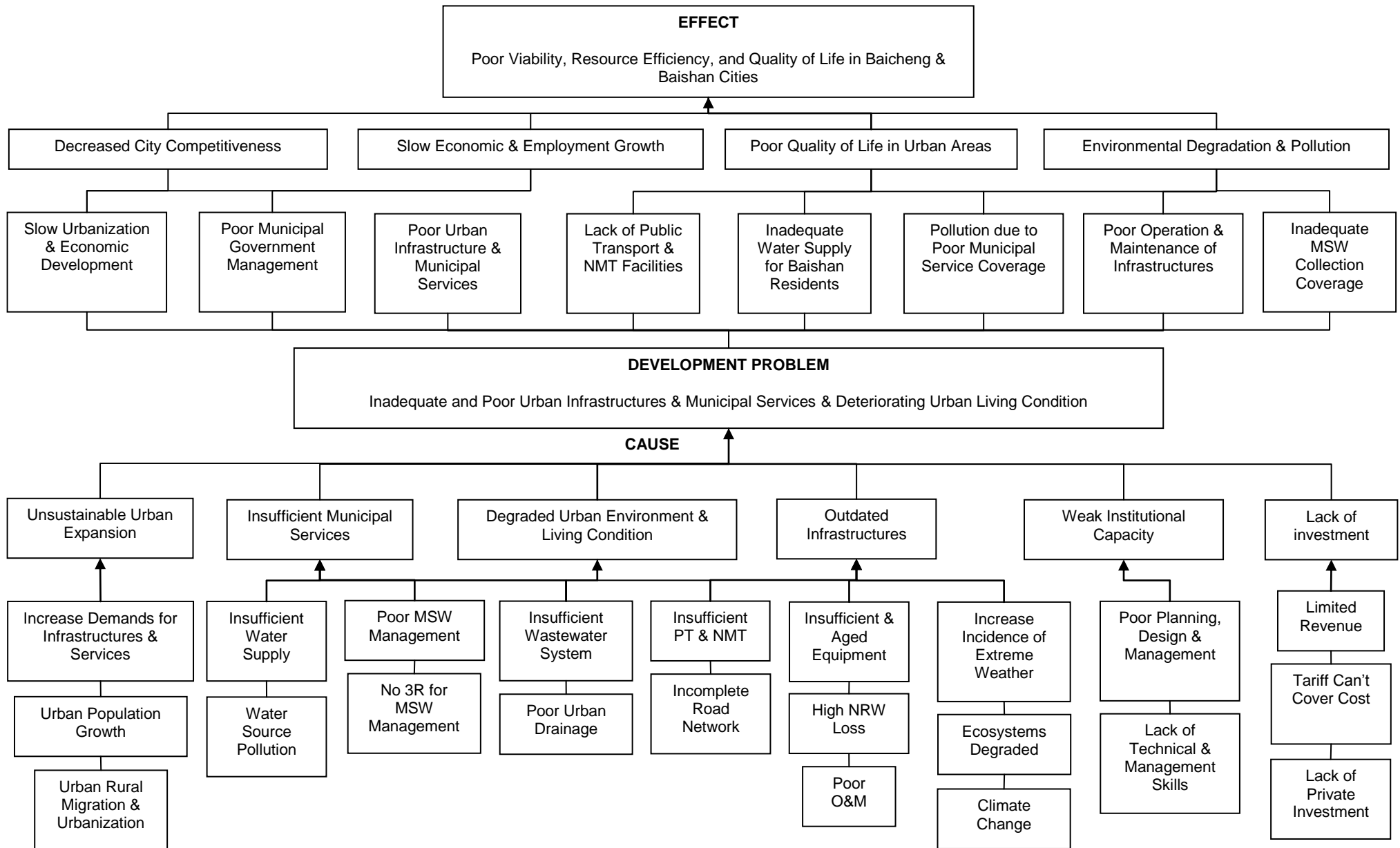
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<sup>14</sup> A long-term plan for urban transport in Baicheng is presented in the PAM.

<sup>15</sup> Water conservation and the implementation of a water safety plan is based on World Health Organization methodology and aims to avoid limitations associated with reliance on end-product testing to control water safety.

<sup>16</sup> The GB5479-2006 standard includes 106 water quality parameters. A long-term water resources management plan for Baishan is presented in the PAM.

## PROBLEM TREE: BAICHENG AND BAI SHAN URBAN SECTOR



3R = reduce, reuse, and recycle; MSW = municipal solid waste, NMT = non-motorized traffic, NRW = non-revenue water, O&M = operation and maintenance.

## Sector Results Framework (Urban Development, 2011–2015)

Country Sector Outcome		Country Sector Outputs		ADB Sector Operations	
Outcomes with ADB Contribution	Indicators with Targets and Baselines	Outputs with ADB Contributions	Indicators with Incremental Targets	Planned and Ongoing ADB Interventions	Expected from ADB Interventions
Competitive, green, and inclusive urbanization.	<p>Water supply and other municipal infrastructure and services.</p> <p>Urban population with access to piped water supply increased from 96% (2009) to 98% (2015).</p> <p>Urban population with access to improved sanitation increased from 58% (2008) to 65% (2015).</p> <p>Domestic solid waste treatment ratio increased from 71% in 2010 to 80% in 2015.</p> <p><b>Education</b> Number of students at secondary vocational schools increased from 21.79 million (2009) to 22.5 million (2015) (sex disaggregated).</p> <p>Number of students at post-secondary vocational schools increased from 12.8 million (2009) to 13.9 million (2015) (sex disaggregated)</p>	<p>Water supply, wastewater, solid waste management systems, and other municipal infrastructure and services expanded and improved.</p> <p><b>Education</b> Infrastructure and services expanded, improved, and well-managed.</p>	<p>Treated water supply increased from 160 million m<sup>3</sup>/day in 2010 to 200 million m<sup>3</sup>/day by 2015.</p> <p>Wastewater treatment increased from 150 million m<sup>3</sup>/day in 2010 to 180 million m<sup>3</sup>/day by 2015.</p> <p>Number of enrolled students at secondary vocational schools increased by 710,000 by 2015 (2009 baseline: 21.79 million).</p> <p>Number of enrolled students at post-secondary vocational schools increased by 1.1 million by 2015 (2009 baseline: 12.8 million).</p> <p>Municipal and town governments' institutional and financing capacity improved</p>	<p>Planned key activity areas: Lending operations with a total investment of \$1.9 billion, including in water supply, wastewater, solid waste management, heating, gas, urban transport, and river rehabilitation.</p> <p>Nonlending programs in finance, environmental management, vocational education, and urban planning.</p> <p>Knowledge products based on technical assistance findings and policy notes.</p> <p>Planned projects (2012–2015, \$1.9 billion): Water supply and sanitation (\$378 million).</p> <p>Urban transport (\$593 million), education (\$108 million); and other municipal infrastructure and services (\$821 million).</p> <p>Ongoing projects (\$2,287 million): Water supply and sanitation (\$895 million), urban transport (\$848 million), education (\$2 million), and other municipal infrastructure and services (\$542 million).</p>	<p>Planned projects (2012–2015):</p> <p>(i) Additional water and wastewater capacity operational (1,385,000 m<sup>3</sup>/day).</p> <p>(ii) Additional urban roads built or upgraded (685 km).</p> <p>(iii) Additional vocational students enrolled (30,000).</p> <p>Ongoing projects: Additional water and wastewater capacity operational (2,654,000 m<sup>3</sup>/day).</p> <p>Additional urban roads built or upgraded (927 km)</p> <p>Additional vocational students enrolled (5,000)</p>

ADB = Asian Development Bank, km = kilometer, m<sup>3</sup>/day = cubic meters per day.  
 Source: Asian Development Bank estimates.