SECTOR ASSESSMENT (SUMMARY): MULTISECTOR (PUBLIC ADMINISTRATION, URBAN SOLID WASTE MANAGEMENT, AND WATER-BASED NATURAL RESOURCE MANAGEMENT)

Sector Road Map

1. Sector Performance, Problems, and Opportunities

1. In 2012, the urban population of the People's Republic of China (PRC) had increased to 712 million (53% of the total population) from 190 million in 1980 (19%).[1] Populations in cities have significantly increased with migration from rural and less-developed areas. Continuing urbanization and economic growth will present significant opportunities and challenges for sustainable urban development and poverty reduction. While rapid economic growth and urbanization have lifted millions out of poverty, they have increased the demand for urban infrastructure and resources. Rapid urbanization has also increased demand for land and housing. Thus, many cities have expanded by using surrounding farmland, with development extending into flood plain areas that may not have adequate flood protection.

2. To balance economic development disparities within the country, the government is encouraging industries in the east to relocate to central and western areas. Hubei Province, located in the south central region, is designated as an area to receive these industries. In the province, industrialization is focused around the capital city Wuhan. The economy of Huanggang, located in eastern Hubei, 78 kilometers from Wuhan, is linked to Wuhan through an economic development plan, the Wuhan 1+8 megacity cluster, which the national government endorsed as a pilot zone for an environment-friendly economy and balanced development within the cluster.[2]

3. Huanggang, the second most populated municipality in Hubei Province, has 7.46 million residents.[3] Traditionally a rural-based economy, Huanggang is one of the poorest municipalities in the province and has a relatively low urbanization rate of 35.7%.[4] The Huanggang municipal government (HMG) in its Twelfth Five-Year Plan, 2011–2015 intends to transform its economic structure and facilitate urbanization with expanded secondary and tertiary industries. Benefiting from its close proximity to Wuhan; improved connectivity with neighboring cities and provinces; and rich historic, cultural, and human resources, Huanggang has the potential to play an important role in facilitating socioeconomic development within the cluster and also in the central region of the PRC. However, various urban development challenges constrain Huanggang's development potential. The existing central urban area cannot accommodate a growing urban population and increased economic activities. Limited urban space and inadequate urban infrastructure has slowed economic development, which in turn slowed urbanization, resulting in Huanggang lagging behind other cities and becoming sidelined from mainstream developments in the province. The Huanggang Municipal Urban Master Plan, 2012–2030, approved by the Hubei provincial government in August 2013, recognized this fundamental constraint to urban and economic development and initiated eastward urban

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[1] National Bureau of Statistics, Government of the People's Republic of China. 2013. *Statistical Yearbook 2013*. Beijing.

[2] The Wuhan 1+8 megacity cluster involves Wuhan; together with Ezhou, Huanggang, Huangshi, Qianjiang, Tianmen, Xianning, Xiantao, and Xiaogan in Hubei Province.

[3] Huanggang comprises one urban district (Huangzhou), two county-level cities, seven counties, and a county-level farm. The total administrative area is 17,446 square kilometers, accounting for 9.4% of the area of Hubei Province.

[4] According to the Hubei Annual Socioeconomic Development Report (2012), Wuhan's per capita gross domestic product in 2012 was about CNY79,878, while that of Huanggang was about CNY19,208, the second lowest among 17 municipalities in Hubei Province.

expansion by developing the New Eastern District (NED) with adequate urban space, infrastructure, and services, and an environment-friendly and socially inclusive urban design to support sustainable rural–urban transition.[5]

4. **Surface water condition**. The PRC has more than 24,800 natural lakes. However, about 20 lakes disappear every year, and about 88.6% of the lakes are in a eutrophic state. Due to rapid urbanization and economic development, domestic and industrial wastewater loads often exceed the carrying capacity of the receiving water bodies. In Hubei Province, the total surface area of lakes is 3,025 square kilometers (km^2) compared with about 26,000 km^2 in the early 1900s. In contrast to rivers and streams, lakes and wetlands are more closed systems with a tendency to accumulate residue.

5. The PRC's Environmental Quality Standards for Surface Water (GB 3838-2002) defines water quality classes for various environmental functions.[6] With improvements in municipal wastewater treatment, increased industrial wastewater treatment and monitoring, and development of stricter water pollution control regulations; the PRC continues to invest in the quality of its water environment. In 2010, 51.9% of the nationally monitored surface water throughout the PRC was within class I–III (58.7% in 2000), 30.4% was class IV–V (24.2% in 2000), and 17.7% was worse than class V (17.1% in 2000).

6. **Challenges**. Key challenges affecting the urban environment in Hubei Province include (i) floods and low per capita water resources; (ii) significant stretches of rivers and lakes that are of unacceptable quality, particularly among tributaries of the Han River and among lakes in Hubei Province, and, to a lesser extent, among some tributaries of the Yangtze River; (iii) lake eutrophication and problems with agricultural nonpoint source pollution; (iv) ecological degradation in the middle and lower reaches of the Yangtze River, including reductions in fish and biological diversity; and (v) increases in discharge of industrial and domestic solid waste, including electronic waste and batteries, and sludge from wastewater treatment plants.

7. Located in the floodplain on the north bank of the Yangtze River, Huanggang is rich in lakes and rivers. Realizing the importance of the water environment to the city's sustainable development, HMG has made major investments in pollution-source control and environmental improvement. However, such efforts have been limited to the existing urban area, leaving the lakes and rivers of the surrounding area neglected. HMG's interventions have not yet reached Baitan and Chiye lakes, in the center of NED. These long-neglected lakes and the associated seven rivers have become ecologically and environmentally degraded. Surface water is polluted with organic matter and nutrients. Lakes and rivers are also silted and blocked with polluted sediments, further degrading their water environment and ecology, and weakening resilience to floods and droughts. The current environmental conditions of the Baitan and Chiye lakes and associated rivers limit Huanggang's ability to achieve sustainable development and a high-quality livable urban environment in NED.

[5] Within NED, HMG is constructing about 4,500 units of low-rent housing, affordable housing, and public rental housing, to meet the housing demand of the poor and migrants. NED will have a technical and vocational education training center to provide job training to students and migrants to match the needs of local industry.

[6] Class I is suitable as a drinking water source without treatment; class II is suitable as grade-one water source protection area for centralized drinking water supply, natural habitat for rare species of fish, and spawning grounds for fish and shrimps; class III is suitable as a grade-two water source protection area for centralized drinking water supply, swimming zones, and sanctuaries for common species of fish; class IV is suitable for general industrial water supply and recreational use involving no direct human contact with the water; class V is only suitable for agricultural water supply and general landscaping use; and class V+ is unsuitable for any use.

8. Water quality in Huanggang's three major urban lakes, namely Baitan, Chiye, and Yiai, is severely polluted and class V or worse. The lakes are affected by organic pollution and nutrients. Sediments contain high levels of nitrogen and phosphorus, particularly near discharge points into the lakes. HMG is investing CNY1.1 billion to improve the water quality in Yiai Lake, which is located in the existing urban area of Huangzhou District, and by 2016 the water quality is expected to improve from class V to at least class IV. Seven rivers in NED have severe buildups of sediments, reducing their channel-carrying capacity and rendering them inadequate for large flood events. The new urban development will create a larger impervious surface area, resulting in a significant increase in storm water runoff, further exacerbating this situation. The project will therefore support an integrated approach to improve the water quality in Baitan and Chiye lakes and rehabilitate urban rivers by removing contaminated sediments, creating constructed wetlands and lake and river embankments, creating vegetated ecological zones with aquatic plants to treat nonpoint pollution, and interconnecting lake water bodies. Specific interventions are designed to (i) improve water quality, (ii) restore lake ecology and healthy hydraulic circulation, (iii) improve the lakes' retention capacity and resilience to climate change, and (iv) enhance public amenities.

9. The lakes and rivers in Huangzhou District are polluted by solid waste. Controling solid waste dumping into the lakes and rivers is vital to improving water quality and to preserving the lakes' amenity value. The survey results show that only 7% of residents have knowledge of waste recycling and sorting. The project will build a new garbage collection and transfer station to serve Baitan and Chiye lakes and their surrounding area to comply with environmental standards. The project will raise public awareness of environmental sanitation, waste sorting, and recycling schemes; and promote community participation to maintain the cleanliness of lakes, rivers, and surrounding areas.

2. Government's Sector Strategy

10. Protecting the water environment and controlling water pollution in the middle and lower reaches of the Yangtze River, the largest of the seven river basins in the PRC is a key government strategy.[7] The strategy stipulates that the water quality target is class IV for the Yangtze River section between Huanggang and Huangshi. For Huanggang, the Yiai Lake Water Pollution Control Project and the Chang River Integrated Water Pollution Control Project are listed in the strategy as key regional pollution control projects.

11. To more effectively protect the water resources, the Hubei provincial government has instituted a key water protection measure—the Hubei Province Lake Protection Regulation (effective since October 2012). In the regulation, 38 lakes in Huanggang are listed for water protection, including Baitan and Yiai lakes in Huangzhou District. Furthermore, the Chang River Basin Master Plan, which covers the 464.5 km^2 catchment area of Chang River in Huanggang, supports river rehabilitation, ecological restoration of urban lakes (including Baitan and Yiai lakes), connection of rivers and lakes, and nonpoint pollution source control.[8] In line with the plan, HMG formulated the River and Lake System Rehabilitation Plan for the Baitan Lake and its Surrounding Area, which focuses on the Baitan Lake Planning Area, or phase 1 of NED for (i) flood protection including embankment strengthening and construction of sluice gates, (ii) waterlogging alleviation including construction of pumping stations and connection channels,

[7] Ministry of Environmental Protection, Ministry of Finance, Ministry of Housing and Urban and Rural Construction, and Ministry of Water Resources, Government of the People's Republic of China. 2011. *Water Pollution Protection and Control Strategy (2011–2015) for the Middle and Lower Reaches of the Yangtze River.* (Document MEP No [2011] 100). Beijing.

[8] Santai River is downstream of Chang River and runs through Hangzhou District, on the west edge of NED.

and (iii) reconnection of the lakes and urban rivers.[9] The project will directly support plan implementation.

12. The PRC Government under its urbanization strategy is prioritizing a process of urbanization and urban development that spreads economic and social benefits across the country while safeguarding the environment. Key principles for environmentally sustainable urban development include adherence to ecological principles, resource and energy management, conservation, waste minimization, and recirculation of materials and energy. A high priority is accorded to making all cities livable by improving the urban environment, including improved municipal and social services and land use, and reduced urban pollution. For urban environmental rehabilitation and surface water restoration, the PRC has had success with sediment dredging, construction of wetlands, and establishment of water circulation systems by connecting lakes and rivers; all were considered in the project design.[10]

13. In line with the national policy, HMG places importance on urbanization and the role of the urban sector in economic and social development, as well as environmental protection and rehabilitation, as outlined in the Huanggang's Twelfth Five-Year Plan, 2011–2015, and the Huanggang Municipal Urban Master Plan, 2012–2030. The project will support these policies and plans by improving the water environment and supporting realization of a healthy, inclusive, and livable urban environment in Huanggang.

3. ADB Sector Experience and Assistance Program

14. ADB assistance to the PRC urban sector has been effective in remedying a range of urban environment problems, with a positive impact on water resources, pollution control, and public health. As of August 2014, ADB had funded 51 loans totaling $5.9 billion for urban sector projects.[11] Experience suggests that project investments and technical assistance interventions are effective when they are part of well-conceived urban development plans and approaches, and support broader approaches. Lessons from previous urban development projects as well as the knowledge generated from various best practices are reflected in the project design, including the lake and river rehabilitation, disposal of dredged material, and water quality monitoring with proper institutional setups.

15. The project is aligned with ADB's (i) country partnership strategy for the PRC, 2011–2015, which defines environment-friendly urban infrastructure development as a priority investment area; (ii) Urban Operational Plan, 2011–2020 and Green Cities initiatives, which promote strengthening of environmental management, and supporting inclusive growth and well-balanced development; and (iii) Water Operational Plan, 2011–2020, which encourages integrated management of water resources particularly in river basins.[12]

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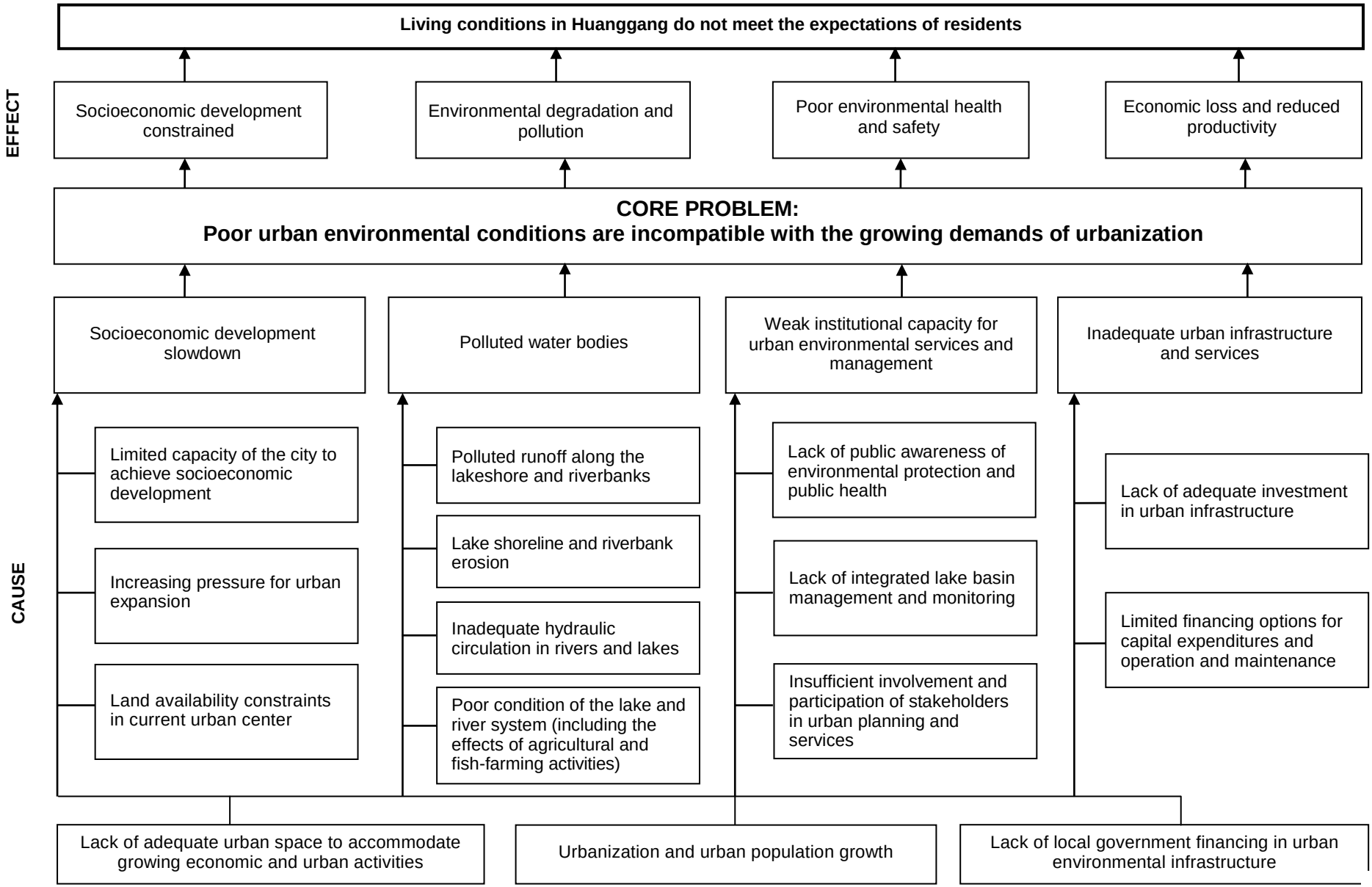
[9] The plan was approved in January 2014.

[10] For example, the East Lake Ecological Water-Net Project in Wuhan, financed by the PRC Government (2009–2014); West Lake Rehabilitation, Hangzhou City, Zhejiang Province, financed by the PRC Government (2002–2007); and Constructed Wetland for Yue Lake, Hanyang District of Wuhan, financed by the Wuhan Government in 2006.

[11] Subsector classifications of urban sector projects include water supply and sanitation, waste management, urban transport, energy utility services, and energy efficiency and conservation. In addition, ADB has other projects processed by the East Asia Department's energy division, transport and communications division, and environment, natural resources and agriculture division that have significant urban components.

[12] ADB. 2012. *Country Partnership Strategy: People's Republic of China, 2011–2015.* Manila; ADB. 2013. *Urban Operational Plan, 2012–2020*. Manila; ADB. 2012. *Green Cities*. Manila; and ADB. 2012*. Water Operational Plan, 2011–2020*. Manila.

Problem Tree



Sector Results Framework (Urban Development 2011–2015)

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

ADB = Asian Development Bank, km = kilometer, m^3 = cubic meter.
Source: Asian Development Bank.