SECTOR ASSESSMENT (SUMMARY): MULTISECTOR (AGRICULTURE, NATURAL RESOURCES, AND RURAL DEVELOPMENT; AND WATER AND OTHER URBAN INFRASTRUCTURE AND SERVICES)

Sector Road Map

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

1. The People’s Republic of China (PRC) has made significant progress in addressing its many environmental challenges, including the challenges in water and pollution intensity as it affects the overall economy, forest coverage, and energy conservation. Water is likely the most pressing resource bottleneck to the PRC’s economic growth from 2016-2030. The PRC’s water crisis is already costing the country at least 2.3% of gross domestic product, of which 1.3% is attributable to water scarcity and 1.0% to the direct impacts of water pollution. Growth in the PRC’s population, cities, and economy will drive continuous growth in demand for water. Climate change also requires better water resource management and disaster management strategies to lessen the constraints that water scarcity puts on economic and urban development.

2. Degradation of ecosystems, water pollution, water scarcity, and pollution from solid waste has important social impacts, the major ones being the health risks related to polluted sources of drinking water. Empirical analysis has examined the links between surface water quality and digestive cancers, highlighting the strong links between water pollution and health in the PRC, as well as the large gains from efforts to reduce pollution. Drinking water in many rural areas is unsafe with unhealthy levels of hazardous materials, such as high concentration of fluoride. Improved water supply and sanitation are closely linked to progress in health, education, gender equality, and environmental sustainability. Better wastewater disposal and drainage and pollution control would improve health outcomes and human productivity by reducing the prevalence of water-related infections and diseases.

3. Originating in Shanxi province, the Qihe River flows into the Weihe River and then the Hai River and finally into the Bohai Sea. The Qihe River basin in Hebi city has been selected by the central government as a national pilot project for achieving “water ecological civilization.” The project area encompasses an 83-kilometer (km) section of the Qi River in Qibin district and Qi county of Hebi city, located in the north of Henan province. The project area takes in about half (51%) of the length of the Qihe River (162 km).

4. The key issues affecting the ecological integrity of the Qihe River include (i) environmental degradation in the upper Qihe River watershed, (ii) poor flood management capacity, (iii) pollution from wastewater and solid waste, and (iv) poor intersector capacity and coordination mechanisms for river basin and water resource management.

5. **Environmental degradation in the upper Qihe River watershed.** Environmental conditions along the river have deteriorated because of intensive economic development and increasing human populations. Vegetation, wetlands, and water quality along the Qihe River have declined because of urbanization, modification of the river hydrology (in-channel barrages and embankments along the river, and a large dam [Panshitou] in the upper section), habitat loss and deforestation, livestock grazing, agriculture, over extraction of water, and nonpoint source

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2 PRC conceptualizes ecological civilization as a development approach that aims to balance the relationship between humanity and nature. In order to achieve ‘ecological civilization’, PRC has selected candidate cities for “water ecological civilization” to establish good practices in ecological and water resources management.
pollution. The variety and quantity of flora and fauna have decreased and the ecological functions of the forest and wetland have been affected. A protected area—the pilot Qihe River National Wetland Park—covers part of the upper Qihe River but requires habitat restoration and improved facilities and management to provide a more effective conservation function and sustainable use for tourism and education.

6. **Poor flood management capacity.** Flood management capacity of the mainstream and tributaries of the lower Qihe River is insufficient because of siltation and the poor condition of old embankments. The flood management capacity of the lower Qihe River mainstream is only good for a 1-in-5-year flood and for a 1-in-3-year flood in the tributaries of the lower Qihe River. In Qi county and Qibin district the tributaries and canals are heavily silted, congested with solid waste, and have degraded banks.

7. **Pollution from wastewater and solid waste.** Surface water quality of the mainstream Qihe River is highly polluted and exceeds class III, while in the canals it exceeds class V. Inadequate facilities for wastewater management have resulted in poor water quality as the three existing wastewater treatment plants that serve the project areas of Qibin district and Qi county cannot handle the increasing volumes of wastewater. The city sewage pipeline collection network currently only covers 60% of the area in Qibin district and Qi county. As a result, untreated wastewater discharges directly to the lower Qihe River mainstream and tributaries. For solid waste, in the rural and sub-urban area of the Qihe River basin, only some villages are equipped with garbage collection tanks, and a few villages are equipped with collection bins in designated locations. Garbage is not sorted for recycling. Furthermore, public collection tanks are often not emptied on time and overflow of garbage is common. Consequently, garbage is discarded on roadsides and on open spaces around houses, including hillsides, depressions, ponds, and river banks. This not only has an adverse visual impact on the surrounding environment but also seriously threatens the health of the local villagers.

8. **Poor intersector capacity and coordination mechanisms for river basin and water resource management.** Numerous agencies are involved in management of the Qihe River, yet there has been relatively limited intersector coordination for integrated water resources management (IWRM) because of lack of an institutional framework and mechanisms for information sharing. The project has already resulted in strengthened institutional arrangements for IWRM through the establishment of a multisector project management office, which will manage project implementation. To support IWRM, continued capacity building, including a management information system and ecological monitoring program, will be essential to guide decision making among the agencies for flood control, conservation, and other management aspects.

2. **Government’s Sector Strategy**

9. The Twelfth Five-Year Plan, 2011–2015 of the PRC includes resource conservation and environmental protection among its main targets. The rural focus under the plan is development that conserves resources and is environmentally friendly, and more sustainable use and

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3 In the PRC, surface water quality and the use of surface water is regulated under the national Environmental Quality Standards for Surface Water Standard (GB 3838-2002), which grades quality and use into five classes: class I (highest quality), drinking water sources and national nature reserves; class II, water source protection areas and habitats of rare aquatic organisms, including threatened fish and fish and shrimp spawning sites; class III, suitable as a supply source for drinking water treatment and swimming; class IV, suitable for general industrial water supply and recreational use not involving direct human contact with the water; class V, suitable only for agricultural water supply and general landscaping; and class V+ (lowest quality), unsuitable for any use. Each class is also defined by a range of water quality parameters.
management of land, water, and natural resources. The plan expresses particular concerns about (i) the degradation of the natural resource base; (ii) pollution of water bodies; (iii) deterioration of soils, forest areas, and biodiversity; (iv) weak rural infrastructure; and (v) relatively low rural incomes and livelihoods. Themes in the plan relating directly to the concerned sector policies include (i) controlling greenhouse gas emissions and increasing adaptability to climate change, (ii) conserving water resources, (iii) enhancing pollutant control and environmental supervision, (iv) constructing waste (sewage and garbage) treatment facilities, (v) restoring environmental health to rivers and lakes, (vi) improving capacity to protect water supplies, and (vii) enhancing flood control capacity.

10. New national policies in recent years include PRC’s goal of building a harmonious and prosperous society through environmentally sustainable growth and the priorities of its Thirteenth Five-Year Plan. The decision of the Third Plenary Session of the 18th Central Committee of the Communist Party of the PRC supports the establishment of a system to protect ecosystems. With these broad thrusts, the Government of the PRC has improved the legal and regulatory setting and strengthened enforcement of environmental laws and regulations. Water resources management has been accorded increasing priority over time. The decree on Reform Measures for Accelerating Development of Water Conservation was issued by the State Council in 2011. Future rural and water resource infrastructure programs will focus on safe drinking water and rural irrigation, including drainage infrastructure rehabilitation.

11. The government is also committed to strengthening rural environmental protection, particularly in controlling nonpoint source water pollution. More stringent enforcement of laws and regulations on the protection of drinking water areas will be applied. In addition, the concept of ecocompensation will be applied to improve incentives for natural resource conservation. In terms of market-based economic policies, the market-based instruments for environmental protection are implemented through and reflected in the environmental economic policies. The PRC has established a comprehensive water environmental economic policy system that entails discharge fees, sewage treatment levies, pollution rights trading, public–private partnership and marketization, and public finance.

12. In the PRC, water pollution control began in the 1970s. Since 1985, environmental economic policy instruments have increasingly applied to watershed environmental management. Before the 1990s, watershed pollution control targeted industrial pollution sources. In 1990, the government put forth the so-called “three rivers and three lakes” pollution control program. In 1996, the PRC Water Pollution Control Law was amended, and the implementation guidelines were proclaimed. The crime of “damaging the protection of the environment and natural resources” was added to the Criminal Law.

13. Watershed pollution control is currently experiencing two important transformations: (i) from industrial point source pollution control to urban and integrated watershed pollution control, and (ii) from the use of purely command and control to integrated management with regulatory and economic instruments.

14. The role of economic instruments in water pollution control has been strengthened. The water pollution control policy instruments used in the PRC before 2000 were mostly taxes and fees. Moreover, the policy instruments focused on post-pollution management. Since 2000, market-based instruments such as pollution rights trading and ecocompensation (in the form of government-led water pollutant trading) have attracted growing attention. This demonstrates that the PRC’s reform toward a market economy has expanded into environmental and natural resources management.
15. To facilitate environmental improvement and ecological conservation in and around Qihe River, the Hebi city government prepared various plans, including the Master Plan for Hebi National Forest City Construction, Master Plan for Hebi City Qihe River Ecological Areas for 2010–2020; Hebi City Urban Master Plan, 2007–2020; and Hebi City Urban Flood and Waterlogging Control Plan for 2011–2020. These plans set targets for 2020, including forest coverage rate in the Qihe River’s watershed (60%) and flood control capacity of the lower Qihe River reach and its tributaries (capacity for a 1-in-20 year flood).

16. The Hebi city government has been putting great emphasis on ecological and water resource protection of Hebi city and the Qihe River National Wetland Park, which has been identified as the key ecological zone in the Hebi City Urban Master Plan, 2007–2020. The key protection measures include reforestation of the Qihe embankment riverside areas to increase the water conservation capacity of the vegetation, and establishment of a Qihe wetland protection zone and strict control of new construction or expansion of high-pollution industries. The plan also aims to achieve forest coverage of 45% in Hebi city by 2020.

3. ADB Sector Experience and Assistance Program

17. The Asian Development Bank (ADB) has developed a diverse and active portfolio in water-based natural resources management, including flood management, wetland conservation, water resources development, and protection of biodiversity and ecosystems. ADB’s lending for water resources sector development in the PRC started in 1998 and has been effective in addressing a range of water resource protection problems, with a positive impact on water resources, pollution control, and public health.

18. In line with the government’s goals and objectives, ADB will continue to assist the government in identifying and applying innovative interventions that will demonstrate increased climate resilience and environmental sustainability, including through a multisector approach for natural resources management in areas which impact rural and urban livelihoods. Support will be provided for integrated water resources and river basin management, including strengthening water security and governance and water pollution control; improving disaster risk management; and promoting innovative eco-compensation mechanisms, environmental regulation and compliance, and market-based instruments to support environmental protection and pollution control. The interventions are aligned with ADB’s Environment Operational Directions, 2013–2020\(^4\) to (i) promote a shift to sustainable infrastructure, (ii) invest in natural capital, (iii) strengthen environmental governance and management capacity, and (iv) respond to climate change. The interventions will also support ADB’s Water Operational Plan, 2011–2020\(^5\) and Urban Operational Plan, 2012–2020,\(^6\) recognizing the increasing demand for water and the impacts on food production of rapid economic development, increasing urbanization, and the large growth in population. ADB will also work with the government to implement the memorandum of understanding with the Ministry of Environmental Protection (signed on 8 January 2014) on cooperation to promote environmental protection.

19. Apart from the proposed project, ADB’s recent project activities involving water environmental protection and water resources management include (i) the Hubei Huangshi Urban Pollution Control and Environmental Management Project, (ii) the Hubei Huanggang Integrated Urban Environment Improvement Project, (iii) the Hubei Enshi Qing River Upstream

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Environment Rehabilitation Project, and (iv) the Hunan Dongjiang Lake Integrated Environmental Protection and Management Project.\textsuperscript{7} It is premature to consider lessons from these projects since they have yet to be completed and evaluated. However, lessons learned from other completed projects in the PRC involving urban development and water resources management can inform the current project design.\textsuperscript{8} Lessons learned and the current applications are summarized in the following table.

### Lessons Learned and Current Application

<table>
<thead>
<tr>
<th>Lessons Learned</th>
<th>Current Application</th>
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<tbody>
<tr>
<td>A mix of both structural and nonstructural measures are needed to ensure</td>
<td>Training and capacity building components have been included into project components.</td>
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<td>success of environmental rehabilitation and water resources management projects.</td>
<td>Project components explicitly incorporate enhanced environmental monitoring and flood management systems and technologies.</td>
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<td>Commitment and leadership by local government is the most important factor</td>
<td>Commitment is indicated by project inclusion in relevant government planning documents.</td>
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<td>contributing to the success of environmental management, water supply, and</td>
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<td>sanitation projects.</td>
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<td>Adequate consultation and better communication with affected people for</td>
<td>Communication measures are being implemented with affected people and a stakeholder</td>
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<td>projects experiencing resettlement issues can reduce implementation delays.</td>
<td>communication strategy is included in the PAM.</td>
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<td>Community participation in environmental management and restoration can</td>
<td>The project has included community participation activities. These are further</td>
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<td>increase ownership of interventions and improve the likelihood of success.</td>
<td>elaborated upon in the community participation plan.</td>
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<td>It is important to ensure sustainable management of facilities based on a</td>
<td>The tariff structure for wastewater treatment in Hebi will be reviewed by project</td>
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<td>realistic tariff structure.</td>
<td>consultants.</td>
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PAM = project administration manual.

20. This project builds on ADB’s experience and lessons from previous projects in Henan and other projects for river protection, water resource management, and development in small and medium-sized cities. Demonstration features applicable to small and medium-sized cities along the Yangtze and elsewhere in the PRC include an integrated approach to environmental and flood management, integrated pollution control, and ecological rehabilitation based on urban wastewater management and rural nonpoint source pollution control.

21. Projects in the natural resources and agriculture sectors have often been small and complex with multiple provinces, a large number of subprojects and implementing agencies, complicated on-lending and guarantee arrangements, and capacity-constrained executing agencies. This suggests that project designs need to be kept simple to reduce processing time and implementation difficulties. More capacity building support for executing and implementing agencies needs to be provided at an earlier stage of project preparation and during project implementation. The proposed project is relatively simple, involving just two counties and one district within a city, and provision will be made to overcome capacity constraints faced by the executing agency.


MULTISECTOR PROBLEM TREE
(Agriculture, Natural Resources, and Rural Development; and Water and Other Urban Infrastructure and Services)

Deterioration of ecology, environment, and quality of life in and around Qihe River in Hebi

- Decrease of variety and quantity of flora and fauna and damage to the original ecological function
- Deterioration of quality of life
- Deterioration of water environment
- Deterioration of public health

- Lack of river basin planning
- Deterioration of vegetation in the upper Qihe River watershed
- Deterioration of wetlands in and around Qihe River
- Frequent floods along the mainstream and tributaries of the lower Qihe River
- Inflow of wastewater into Qihe River and its tributaries
- Deterioration of water quality in tributaries in the lower Qihe River
- Incidence of waterborne diseases

- Deforestation
- Livestock operations
- Agriculture
- Insufficient water
- Nonpoint source pollution
- Excessive fishing
- Damaged and/or low embankment
- Siltation
- Low capacity of an existing wastewater treatment plant
- Insufficient sanitary sewers
- Increase of population

- Water exploitation
- Steepness of the upper Qihe River
- Increase in evaporation rates
- Rise in temperatures
- Climate change