

## **SECTOR ASSESSMENT (SUMMARY): WATER AND OTHER URBAN INFRASTRUCTURE AND SERVICES; AND AGRICULTURE, NATURAL RESOURCES, AND RURAL DEVELOPMENT<sup>1</sup>**

### **A. Sector Road Map**

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

1. The People's Republic of China (PRC) has experienced unprecedented economic growth in the last 30 years, becoming the second largest economy in the world and accomplishing significant poverty reduction. However, it faces serious environmental problems and a widening economic disparity between urban and rural areas. Accounting for about 45% of the PRC's gross domestic product (GDP), the Yangtze River Economic Belt (YREB) is an economic growth engine, but a combination of rapid economic development, urbanization, intensive agriculture production, and tourism growth has increased both environmental and ecological pressures across the Yangtze River Basin. While the Government of the PRC continuously promotes the economic development of the YREB, it still faces significant development challenges as a result of increasing pollution, slow transition into green development, and weak institutional coordination for strategic planning. To manage these challenges, the government formulated the YREB Development Plan, 2016–2030, which stipulates the prioritization of ecological protection and the promotion of green development as the guiding principle for the YREB's future growth.<sup>2</sup> In this context, the Asian Development Bank (ADB) and the government have agreed to adopt a framework approach to address these challenges.<sup>3</sup>

2. The Xin'an River is located within the YREB, originating in Huangshan municipality and passing through Hangzhou, the capital city of Zhejiang province, before entering the sea. The river is the main source of drinking water for 10 million residents living in the urban and rural areas surrounding Qiandao Lake and Hangzhou. Rapid economic development, urbanization, intensive agriculture production, and tourism growth have increased both environmental and ecological pressures across the river basin. The government selected Xin'an River as the first demonstration case to pilot the innovative cross-provincial ecological compensation (eco-compensation) mechanism for protecting the PRC's ecosystem. Huangshan, a famous tourist destination, is a prefecture-level municipality located in the southern part of Anhui province upstream of the Xin'an River Basin, comprising three urban districts and four counties with a population of 1.5 million and an area of 9,807 square kilometers. Maintaining the level of water quality in the upstream of the Xin'an River with current management practices in Huangshan is becoming increasingly difficult. Ecological protection of the river will strengthen water safety, enhance livelihoods, and improve sustainability of the region's green development.

3. The pilot eco-compensation scheme between Anhui and Zhejiang provinces established a revolving arrangement, where compensation is provided for reducing pollutant load in the Xin'an River via the establishment of the Xin'an River eco-compensation scheme.<sup>4</sup> Major progress has been achieved because of stricter regulation and improved management of industries, pollution

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<sup>1</sup> ADB. 2017. *Technical Assistance to the People's Republic of China for Preparing Yangtze River Economic Belt Projects*. Consultant's report. Manila (TA 9311-PRC). Available on request.

<sup>2</sup> Government of the PRC. 2016. *Outline of the Yangtze River Economic Belt Development Plan, 2016–2030*. Beijing.

<sup>3</sup> During a country programming mission in 2016, ADB and the Government of the PRC agreed to a strategic framework approach with lending support of \$2.0 billion to the YREB over a 4-year period (2017–2020).

<sup>4</sup> Results of annual assessments of water quality improvements determine whether one province compensates the other to defray management costs (Anhui province) or added treatment costs (Zhejiang province).

control interventions, and the pilot eco-compensation scheme.<sup>5</sup> Traditional pollutants (e.g., biochemical oxygen demand and chemical oxygen demand) from heavy industries are now under control. The water quality at the interprovincial section meets the standards agreed between the two provinces, and the water quality of the Xin'an River is above the national average. During the first two phases (2012–2017), industrial wastewater was reduced by 31%, chemical oxygen demand by 28%, and ammoniacal nitrogen levels by 61%.<sup>6</sup> However, the level of total nitrogen did not change, and the level of total phosphorus increased. The scheme's third phase (2018–2020) focuses in controlling nonpoint source pollution. Based on these achievements, ADB will work with the Huangshan Municipal Government (HMG) to develop a new advanced ecological protection and green development model for the YREB.

4. **Urban point source pollution.** Following great pollution control efforts during the last 20 years, over 90% of urban wastewater in Huangshan had been collected and treated. By the end of 2018, there were seven municipal wastewater treatment plants in Huangshan (with a combined capacity of 230,000 cubic meters per day), and the length of sewers increased by over 270% during the past decade.<sup>7</sup> Point source pollution from urban sewage contributes to the decline of water quality in the Xin'an River. Despite progress made in Huangshan's urban wastewater and sanitation facilities, its sewage collection infrastructure is still inadequate. The sewerage systems in Huangshan's old urban areas are combined sewerage systems, which cause overflow to be discharged directly to rivers in rainy seasons and affects the river water quality. While separate sewerage systems have been installed in new urban areas, these sewerage systems were not systematically planned and were not designed to cope with the rapid development in the last decades. Existing sewers have poor quality, which causes severe infiltration of groundwater into sewers and feeds diluted wastewater to treatment plants. Because of the mountainous terrain, Huangshan is vulnerable to flooding during storms. The existing river embankment and revetment fail to meet the design criteria stipulated in urban flood control plans or lack proper maintenance. Other point sources include stormwater runoff and overflows of combined sewerage systems.

5. **Rural point and nonpoint source pollution.** Discharge of untreated rural wastewater is also a major point source pollution. Huangshan has 889 villages, 75% of which have no wastewater treatment facilities. Installed facilities are malfunctioning because of design failures or lack of adequate maintenance. Moreover, the rural wastewater discharge standards and cost recovery mechanism remain as critical issues in Huangshan's rural development. Agriculture-based nonpoint source pollution is a key factor that continues to negatively impact the Xin'an River's water quality and ecological functions. Nonpoint source pollution from agriculture is mainly because of poorly regulated and managed disposal of runoffs and inappropriate use of fertilizers.<sup>8</sup> A recent study in the upstream region of the Xin'an River Basin found that about 75% of the pollution in water bodies is derived from agricultural production, of which up to 40% emanates from tea farming and crop production.<sup>9</sup> The dispersed nature of agricultural activities makes the control of nonpoint source pollution a challenge. In addition to direct impacts from agricultural activities, water and soil erosion is also a key factor leading to nonpoint source

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<sup>5</sup> Interventions have included shutting down polluting industries, building wastewater treatment capacities, and building up buffer zones along the Xin'an River.

<sup>6</sup> Financial resources from the central government and two provincial governments totaled CNY1.5 billion in the first phase of the eco-compensation scheme and CNY21.6 billion in the second phase. The total compensation fund in the third phase amounts to CNY1.3 billion.

<sup>7</sup> The total length of sewers in urban areas is approximately 1,316 kilometers, of which the length of combined sewers is about 145 kilometers, or 11% of the total.

<sup>8</sup> The pollution emanates from agricultural land used for tea farms, rice fields, and bamboo plantations.

<sup>9</sup> Chinese Academy for Environmental Planning. 2018. *Performance Evaluation Report for Eco-compensation Pilot Project in Xin'an River Watershed (2012–2018)*. Beijing. Of the total discharge into the environment, nitrogen pollutants from agricultural sources accounted for 75% and phosphorus pollutants for 69.2%.

pollution in Huangshan. The resilience of the river ecosystem is further impacted by poor forest management and pest attacks, which undermine the forest's capacity to control soil erosion. Intensification of tourism, if unmanaged, will lead to increased water pollution.

6. **Huangshan's green development.** The achievements in ecological improvements in Huangshan have come at a high cost. The need to protect water quality has resulted in a substantial loss of jobs because of the closing down of polluting industries and the lack of growth opportunities. There is an urgent need to create alternative livelihoods for local people through the promotion of green growth. Analysis has highlighted Huangshan's growth potential and competitive advantage in two traditional leading industries: tourism and agriculture. Although Huangshan has tourism resources in terms of heritage sites and natural scenery attractions, its economic development and population pressures continue to pose challenges.<sup>10</sup> As Huangshan is considered a relatively poor city, there is an urgent need for a sustainable financing mechanism for investments to address water pollution and support livelihood development. The HMG needs to examine how public funds can leverage private sector capital to accelerate green development, such as village-based ecotourism. Huangshan's economy is still below the average national level and is ranked among the lowest in terms of GDP in Anhui province. Promoting green growth will need to mitigate the environmental impacts of intensified tourism, and to engage farmers to adopt environment-friendly green farming practices. Appropriate development models are essential to address such issues in Huangshan.

7. **Institutional and environmental management capacity.** By the end of 2018, the HMG had developed a series of online monitoring and management information systems in the areas of water resources management, environmental protection, forestry, and agriculture. However, existing management information systems are not connected to each other, which hinders information sharing and collaboration among different departments. Information integration has become a key issue in enhancing management efficiency. The HMG urgently requires strengthened institutional and technical capacity for water resources and environmental management, including monitoring and pollution control, disaster risk management, and data management. The sharing of information with the downstream Qiandao Lake area in Zhejiang province needs to be institutionalized. Cross-provincial water pollution management in the Xin'an River requires effective collaboration. Capacities in water resource and environmental management need to be enhanced at the district and county levels. Integrated mechanisms for eco-compensation and green financing may act as a financial incentive to promote better watershed management practices.

## 2. Government's Sector Strategy

8. The PRC is transitioning to a new high-quality development model that emphasizes innovation, productivity, sustainability, social inclusion, and more sophisticated well-being. Recent government policies are promoting a shift from development oriented on GDP growth to development centered on high quality. The PRC's Thirteenth Five-Year Plan, 2016–2020<sup>11</sup> and the National New-Type Urbanization Plan, 2014–2020<sup>12</sup> emphasize continued urbanization along with industrialization, development of information and communication technology, and agricultural modernization. These ambitions call for institutional and fiscal reform, a regionally

<sup>10</sup> Government of the PRC, Ministry of Culture and Tourism. 2018. *Annual Tourism Statistics Data and Reporting*. Beijing.

<sup>11</sup> Government of the PRC. 2015. *Outline of the Thirteenth Five-Year Plan for Economic and Social Development of the People's Republic of China, 2016–2020*. Beijing.

<sup>12</sup> Government of the PRC. 2013. *National New-Type Urbanization Plan, 2014–2020*. Beijing. The plan focuses on migrants, urban spatial layout, urban sustainability, and integration of urban and rural development.

balanced economy, and private sector participation. The YREB Development Plan (footnote 2) guides the future development path of the YREB toward ecological restoration and green development.<sup>13</sup> The targets are to (i) improve the environmental quality of the Yangtze River by 2020; (ii) increase the region's water resources that meet the class III standard by more than 75%; and (iii) increase forest cover to 43%. The PRC also released guidelines on implementing a rural vitalization strategy, identifying agriculture, farmers, and rural areas as major bottlenecks to achieving the PRC's economic development and environmental restoration goals.<sup>14</sup> Huangshan's development direction focuses on environmental protection standards, sewage treatment rate, water resources management, forestry development, and agriculture and rural development.

## B. Major Development Partners: Strategic Foci and Key Activities

9. A diversified range of development assistance programs from multilateral and bilateral development partners targets management of water resources, agriculture, and overall environment and ecological restoration, which are priorities of the government. ADB is a development partner in these areas, covering infrastructure development, institutional and capacity improvement, policy reforms, and strategy development, all of which support the PRC's Thirteenth Five-Year Plan, 2016–2020 (footnote 11) and previous five-year plans. The Multilateral Development Bank Lending Support for Industrial Transformation in the YREB, ADB, and the World Bank Group—collectively referred here as multilateral development banks—have committed to potential lending support for industrial transformation in the middle and upper reaches of the YREB.<sup>15</sup> The multilateral development banks expressed their support for the government's strategic decision to set ecological protection and green development as the top priorities for development along the YREB (para. 1).

10. Since the 1990s, the Anhui Provincial Government (APG) has received financial assistance from various bilateral development agencies, international financial institutions, and foreign governments. From 2010 to 2015, the APG received bilateral financial assistance for 56 projects with a total loan amount of \$1.62 billion from 15 development partners. ADB is the second largest development partner of the APG after the World Bank. Since 2008, ADB has provided the APG eight project loans with a total amount of \$1.31 billion, contributing to improvement of transport, water and urban infrastructure, agriculture and rural development, elderly care and health, and ecology and environment protection in Anhui province. The table lists key externally financed projects in water and other urban infrastructure and services; agriculture, natural resources, and rural development; and water resources and environmental management in the PRC.

### Major Development Partners

Development Partner	Project Name	Duration	Amount (\$ million)
<b>Water and Other Urban Infrastructure and Services; and Water Resources and Environmental Management</b>			
World Bank	Anhui Shaying River Channel Improvement Project	2011–2017	100.0

<sup>13</sup> Government of the PRC. 2016. *Notice of the Guidelines on Strengthening the Environmental Pollution Prevention and Management in Yangtze River Golden Waterway*. Beijing.

<sup>14</sup> Government of the PRC, National Development and Reform Commission. 2018. *Guidelines on Implementation of Rural Vitalization Strategy*. Beijing.

<sup>15</sup> Officials and experts from the MDBs, the Ziyang Municipal Government, and selected provincial governments in the middle and upper reaches of the YREB, along with representatives from selected development zones, participated in a consultation workshop on MDB Lending Support for Industrial Transformation in the YREB on 15 July 2016 in Beijing.

<b>Development Partner</b>	<b>Project Name</b>	<b>Duration</b>	<b>Amount (\$ million)</b>
World Bank	Huai River Basin Flood Management and Drainage Improvement Project	2010–2016	200.0
World Bank	China Bengbu Integrated Environment Improvement Project	2008–2015	100.0
ADB	Anhui Huainan Urban Water Systems Integrated Rehabilitation Project	2014–2021	150.0
ADB	Anhui Hefei Urban Environment Improvement Project	2008–2014	150.0
JBIC	Anhui Municipal Solid Waste Treatment Project	2009–2015	47.7
ADB	Wuhan Urban Environmental Improvement Project	2011–2015	100.0
ADB	Guangdong Chaonan Water Resources Development and Protection Demonstration Project	2014–2020	100.0
ADB	Jilin Water Supply and Sewerage Development Project	2005–2012	100.0
ADB	Harbin Water Supply Project	2004–2009	100.0
ADB	Anhui Chao Lake Environmental Rehabilitation Project	2013–2020	250.0
World Bank	Ma'anshan Cihu River Basin Improvement Project	2013–2020	100.0
World Bank	Huai River Pollution Control Project	2001–2008	105.5
ADB	Qingdao Water Resources and Wetland Protection Project	2008–2017	45.0
ADB	Guiyang Integrated Water Resources Management (Sector) Project	2009–2018	150.0
ADB	Hubei Enshi Qing River Upstream Environment Rehabilitation Project	2015–2021	100.0
ADB	Hunan Dongjiang Lake Integrated Environmental Protection and Management Project	2015–2021	130.0
ADB	Anhui Environmental Improvement Project for Industrial Pollution Abatement	1997–2004	112.0
ADB	Integrated Ecosystem and Water Resources Management in the Baiyangdian Basin	2009–2014	100.0
<b>Agriculture, Natural Resources, and Rural Development</b>			
World Bank	Anhui Yellow Mountain New Countryside Demonstration Project	2013–2019	100.0
World Bank	Rural Migrant Skills Development and Employment Project	2008–2015	50.0
World Bank	Smallholder Cattle Development Project	1999–2005	93.5
ADB	Comprehensive Agricultural Development Project	2013–2018	200.0
ADB	Gansu Featured Agriculture and Financial Services System Development Project	2015–2021	100.0
ADB	Comprehensive Agricultural Development Project	2012–2018	200.0
ADB	Shanxi Integrated Agricultural Development Project	2009–2016	100.0
ADB	Ningxia Integrated Ecosystem and Agricultural Development Project	2008–2016	100.0
ADB	Henan Sustainable Agriculture and Productivity Improvement Project	2007–2016	66.7

ADB = Asian Development Bank, JBIC = Japan Bank for International Cooperation.

Source: ADB.

### **C. Institutional Arrangements and Processes for Development Coordination**

11. ADB is committed to sharing sector information and experiences in partnership with its developing member countries and other development agencies. In line with its support for the 2005 Paris Declaration on Aid Effectiveness and the 2008 Accra Agenda for Action, ADB harmonizes its policies, procedures, and practices with its key development partners during

implementation through technical working groups and joint missions, among others. In addition, ADB supports global and regional efforts to enhance aid effectiveness. The Government of the PRC coordinates development assistance through the Ministry of Finance, the National Development and Reform Commission, and/or other ministries. These agencies work together to ensure that the Thirteenth Five-Year Plan (footnote 11) serves the PRC's needs, and suits the interests and expertise of each organization. ADB's PRC Resident Mission plays a key role in drawing lessons from project processing and implementation, and in sharing knowledge and experience with other development partners.

12. According to the Anhui Provincial Development Framework, development coordination is undertaken by the Anhui Development and Reform Commission and the Anhui Provincial Finance Department. This commission and department work together to review development assistance requests from the district and county governments under their jurisdiction and other provincial departments, align their needs with the priorities and programs of different development partners, and submit requests to the central government for projects.

#### **D. ADB Experience and Assistance Program**

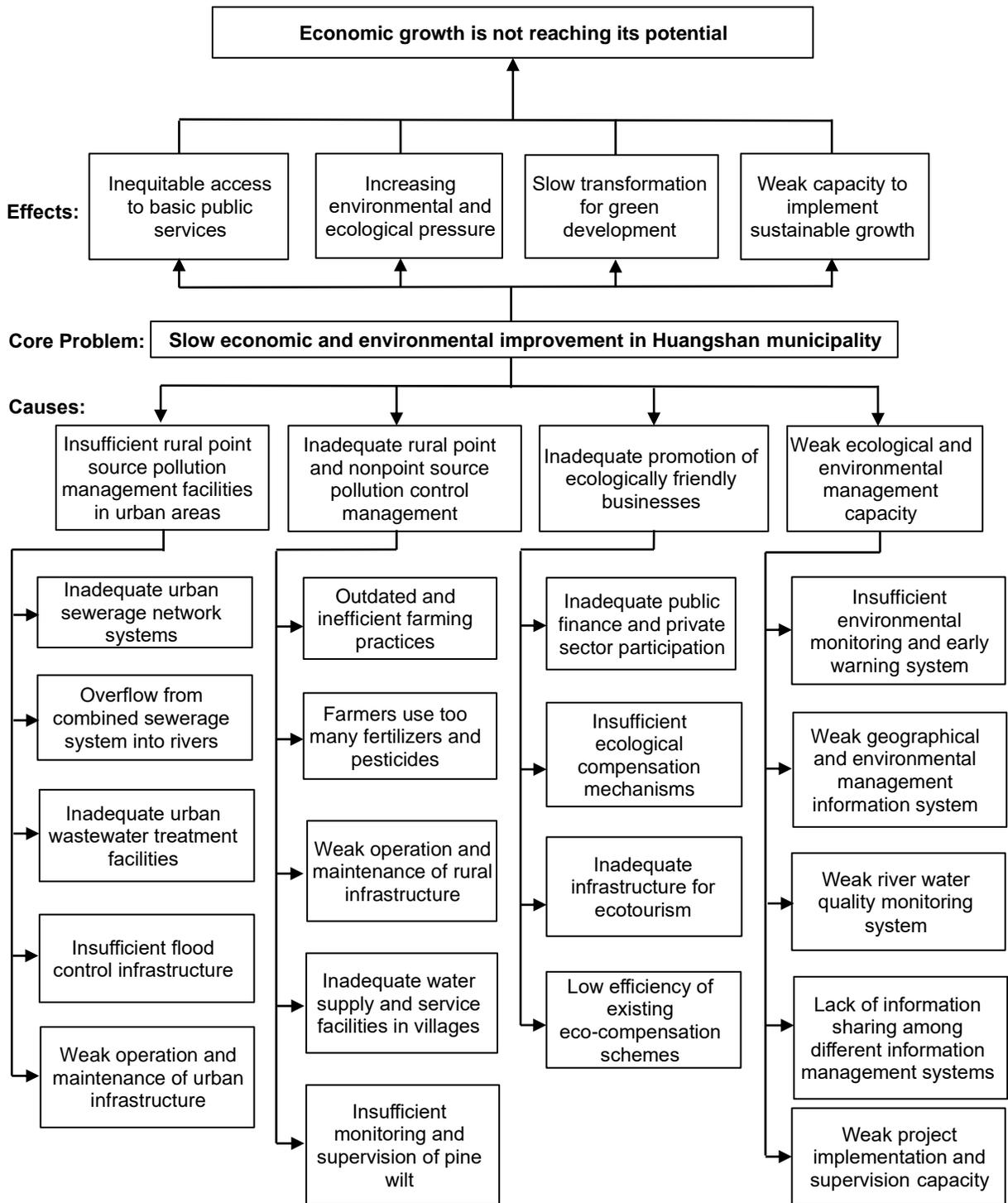
13. ADB started lending support in 1986 to activities related to the PRC's water and other urban infrastructure and services sector; and its agriculture, natural resources, and rural development sector. More recently, the focus has been on developing livable, green, and socially inclusive small and medium-sized cities in the less-developed central, western, and northeastern regions of the PRC. From 1992 to 2017, ADB approved 58 loans amounting to \$7.0 billion, and 92 technical assistance (TA) projects totaling \$61.4 million in the water and other urban infrastructure and services sector.<sup>16</sup> The loans financed infrastructure and capacity development and the TA projects contributed to knowledge and policies on water resources management, agriculture, rural development strategies, urban–rural development, environmental protection and management, and public participation. ADB's country partnership strategy for the PRC, 2016–2020 is fully aligned with the government's Thirteenth Five-Year Plan (footnote 11) and ADB's approach to supporting upper-middle-income countries.<sup>17</sup> ADB will continue to focus on addressing the institutional challenge of implementing national policy priorities and to support the PRC in areas where it can add the most value, such as developing pilot projects and policy innovations, strengthening institutions, promoting reforms and capacity building, expanding private sector operations (including public–private partnerships), promoting advanced technologies, and sharing best practices. Continued support has been sought by the PRC to strengthen its efforts in the environmental protection and rehabilitation of the Yangtze River based on a strategic framework approach (footnote 3). The PRC requested ADB to assist in demonstrating municipality development that ensures environmental sustainability and social inclusiveness. Experience suggests that project investments and TA interventions are effective when they (i) support broader, innovative, and integrated approaches to management and monitoring; and (ii) are better coordinated across sectors and administrative boundaries in the YREB.

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<sup>16</sup> ADB. [Statement of ADB's Sovereign Loans, 1968–2017](#) (accessed 6 August 2019).

<sup>17</sup> ADB. 2016. *Country Partnership Strategy: People's Republic of China, 2016–2020—Transforming Partnership: People's Republic of China and Asian Development Bank*. Manila.

**PROBLEM TREE**



Source: Asian Development Bank.