



# Program Information Documents (PID)

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Appraisal Stage | Date Prepared/Updated: 28-Oct-2021 | Report No: PIDA242112

**BASIC INFORMATION****A. Basic Program Data**

Country China	Project ID P171644	Program Name Yangtze River Protection and Ecological Restoration Program	Parent Project ID (if any)
Region EAST ASIA AND PACIFIC	Estimated Appraisal Date 12-Oct-2021	Estimated Board Date 21-Dec-2021	Practice Area (Lead) Water
Financing Instrument Program-for-Results Financing	Borrower(s) People's Republic of China	Implementing Agency National Development and Reform Commission, Changjiang Water Resources Commission, Jiangxi Provincial Finance Department, Jiangxi Provincial Development and Reform Commission, Hunan Provincial Finance Department, Hunan Development and Reform Commission	

## Proposed Program Development Objective(s)

To improve institutional coordination, enhance ecological protection and reduce water pollution in select regions of the Yangtze River Basin

**COST & FINANCING****SUMMARY (USD Millions)**

<b>Government program Cost</b>	6,526.00
<b>Total Operation Cost</b>	6,526.00
Total Program Cost	6,516.00
IPF Component	10.00
<b>Total Financing</b>	6,526.00
<b>Financing Gap</b>	0.00

**FINANCING (USD Millions)**

<b>Total World Bank Group Financing</b>	400.00
World Bank Lending	400.00



<b>Total Government Contribution</b>	6,126.00
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Decision

The review did authorize the team to appraise and negotiate

## B. Introduction and Context

### Country Context

1. China's rapid growth has led to severe pressures on its environment and natural resources, with impacts on the economy, human health, and global climate. Over the past four decades, China has experienced an extraordinary period of economic growth averaging over 10 percent per year, with a 25-fold increase in per capita income.<sup>1</sup> However, China's growth model has caused severe pollution and persistent inefficiencies in resource use. The implied economic cost of environmental degradation was estimated as 2.2 to 3.1 percent of GDP annually between 2004 and 2017,<sup>2</sup> evident in widespread air, soil, and water pollution, and diminishing biodiversity levels.<sup>3</sup> Impacts from climate change have compounded these environmental issues and contributed further to economic costs.<sup>4</sup> These damages are increasingly reflected in community concerns, with the number of related petition letters and visits received by central government increasing 16-fold between 1996 and 2018.<sup>5</sup> In 2020, the Yale Environmental Performance Index ranked China 120 out of 180 countries based on multiple environmental dimensions. While this is an improvement over previous years, multiple environmental indicators remain below those of other income-comparable, upper middle-income countries.<sup>6</sup>

2. Recognizing these challenges, transitioning to a more balanced and sustainable economic growth model has become a key policy priority. China's 13th Five Year Plan (FYP) (2016-2020) emphasized the need for high quality green development based on productivity and innovation, rebalancing growth towards consumption and services, and increased stringency of environmental regulations.<sup>7</sup> Central government funding of environmental protection and pollution control increased to US\$ 35.7 billion by 2019, five times more than in 2017.<sup>8</sup> China saw a slowdown in the growth of greenhouse

<sup>1</sup> Income per capita rose from US\$300 in 1978 to US\$10,276 in 2019. Extreme poverty rate fell from 88.1 percent in 1981 to 3.2 percent by the end of 2018. Poverty is based on the (2011 purchasing power parity) US\$1.90 per day poverty line. See World Bank Open Data ([link](#)).

<sup>2</sup> Ma, G. et al. (2020). The valuation of China's environmental degradation from 2004 to 2017. *Environmental Science and Ecotechnology*, 1 ([link](#)).

<sup>3</sup> Ouyang, et al. (2016). Improvements in ecosystem services from investments in natural capital. *Science*, 352: 1455–1459 ([link](#)).

<sup>4</sup> China is ranked 32 out of 180 countries on the Climate Risk Index (CRI), which indicates the level of exposure and vulnerability to extreme weather events.

<sup>5</sup> From 614 to 9,669, see Ministry of Ecology and the Environment (2019). *State of Ecology and the Environment Report* ([link](#)).

<sup>6</sup> Wendling, Z.A., et al. (2020). *2020 Environmental Performance Index*. Yale Center for Environmental Law & Policy. New Haven, Connecticut ([link](#)).

<sup>7</sup> See the 2015 Resolution of China State Council for Promoting Ecological Progress ([link](#)).

<sup>8</sup> China Water Risk (2019). *2018 State of Ecology and Environment Report Review* ([link](#)).



gas (GHG) emissions, reduced local air and water pollution,<sup>9</sup> improved resource efficiency, and enhanced land management during this period.<sup>10</sup> The 14th FYP (2021-25), released in March 2021, reflected a strengthening of ambitions, including planned reductions in GHG emission intensity, improved water pollution and land management, and references the importance of climate change adaptation. The intended shift toward green development is encapsulated by the concept of an "ecological civilization" – a more harmonious relationship between society and the environment.<sup>11</sup> This concept represents a key political vision and was enshrined in China's constitution in 2018.<sup>12</sup>

3. Addressing water pollution, including plastic debris, is an integral element of this greener vision. Despite some improvements in recent years, challenges of water quality remain acute.<sup>13</sup> About 86 percent of monitored groundwater sites are polluted and 29 percent of major rivers fail to meet the basic quality standards (grades I-III) required for sources of drinking water supply.<sup>14</sup> Pollution arises from industrial, domestic, and agricultural sources, with challenges increasingly around non-point sources such as agriculture. A number of studies have highlighted the role of China's rivers in transporting mismanaged plastics waste to oceans.<sup>15</sup> While there is a need for further research, an estimated 17.2 million tons of China's plastic waste is mismanaged,<sup>16</sup> and between 1.32 and 3.53 million tonnes of plastic enter China's oceans, primarily via rivers, every year. In the absence of interventions this volume is expected to grow as the consumption of plastics doubles over the next two decades.<sup>17</sup> Across types and sources, the cost of water pollution in China was estimated at US\$ 141 billion nationwide in 2017.<sup>18</sup>

### Sectoral and Institutional Context

4. **The Yangtze River Basin and the economic belt it defines is a necessary focus of the government's efforts towards a greener China.** The Yangtze River Basin includes 19 provinces, municipalities, and autonomous regions, including the nine provinces and two municipalities that define the Yangtze River Economic Belt (YREB).<sup>19</sup> In 2018 the GDP generated in the YREB was estimated at US\$ 5.7 trillion (RMB 40.3 trillion) accounting for 45 percent of national GDP.<sup>20</sup> The annual water resources of the Basin are estimated at roughly 35 percent of the national total, and have important implications for China's water, food and energy security. The basin is one of the world's most biologically diverse ecoregions due to its climatic and geographic variation, is home to some of China's most iconic and endangered species,

<sup>9</sup> Ouyang, et al. (2016). Improvements in ecosystem services from investments in natural capital. *Science*, 352: 1455–1459 ([link](#)).

<sup>10</sup> Bryan, et al. (2018). China's Response to a National Land-System Sustainability Emergency. *Nature*, 559 (7713): 193–204. ([link](#))

<sup>11</sup> Ecological civilization describes a society conforming to and protecting natural environments for co-existence between people and nature. It requires social and environmental reforms to enhance resource and ecological conservation, environmental sustainability, and development.

<sup>12</sup> Hansen, et al. (2018). Ecological civilization: Interpreting the Chinese past, projecting the global future. *Global Environmental Change*, 53: 195-203 ([link](#)).

<sup>13</sup> Ma, et al. (2020). Pollution exacerbates China's water scarcity and its regional inequality. *Nature Communications*, 11 ([link](#)).

<sup>14</sup> Ministry of Ecology and the Environment (2019). State of Ecology and the Environment Report ([link](#)).

<sup>15</sup> Jambeck et al 2015, Schmidt et al 2018, Lebreton et al 2018

<sup>16</sup> Lebreton, L and Andrady, A. (2019). Future scenarios of global plastic waste generation and disposal. *Palgrave Communications*, 5(6).

<sup>17</sup> WEF (2016). The New Plastic Economy: Rethinking the Future of Plastics. World Economic Forum ([link](#)).

<sup>18</sup> Ma, et al. (2020). The valuation of China's environmental degradation from 2004 to 2017. *Environmental Science and Ecotechnology*, 1 ([link](#)).

<sup>19</sup> The YREB comprises Yunnan, Sichuan, Chongqing, Guizhou, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang and Shanghai.

<sup>20</sup> China Statistical Yearbook (2019).



and provide critical habitat for internationally migratory birds.

5. **The Yangtze River and its tributaries face challenges of water pollution, plastics debris, and ecological degradation.** Over the past four decades, the Basin has experienced large-scale, high-intensity development and water-polluting industrial activity, and is today one of the most human-impacted large rivers in the world. Over 40 percent of lakes and reservoirs Basin-wide are subject to eutrophication<sup>21</sup> with agricultural non-point source pollution, notably runoff from excessive fertilizer application, a major contributor.<sup>22</sup> Of water pollutants, phosphorus from agriculture and domestic wastewater is one of the most problematic, with the river among the top five globally most severely affected by phosphorus pollution. The resulting degradation of water quality and ecosystems is driving losses of globally significant biodiversity as well as undermining the Basin's contribution to human uses. The Yangtze River is also a major source of global marine plastic pollution, with mismanaged solid waste washing into waterways and reaching the ocean. Marine plastic pollution has detrimental impacts on marine ecosystems.<sup>23</sup>

6. **Investments have made significant contributions to addressing these issues; however, further improvements will require institutional measures.** The proportion of major river basins meeting drinking water standards (class I-III) increased from 61 percent in 2011 to 83 percent in 2020. Despite these achievements, enhanced control of specific pollutants, such as phosphorus and plastics, remains needed. Broad and sustained improvements will require improvements in institutions and management systems, including harmonized and better-enforced standards, integrated monitoring platforms, basin-wide data and management systems that can improve coordination between branches and levels of government, and improved technical understanding of pollution hotspots and sources. In recognition of these needs, legislation for protection of the Yangtze River was approved by the National People's Congress on December 26, 2020. The law is an element of the Governments' national strategy for the Yangtze River Economic Belt, and is the latest in a series of national level reforms aimed at improving the management of natural resources and the coordination of water resources development.

7. **While these policies and institutional reforms provide a foundation for integrated basin management, implementation challenges persist.** The Development Plan and Yangtze River Protection Law are relatively high-level instruments, and their specific measures require further development of regulations and operating procedures at multiple levels of government. Coordination mechanisms are required to align provincial actions, build consensus with local government, and arbitrate in cases of dispute. Operating efficiencies in some water-related infrastructure is low, the knowledge base for integrated basin-level management (e.g. hydrology of pollution flows) requires further development, and means of data sharing and collection require strengthening and standardization.<sup>24,25</sup>

## PforR Program Scope

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<sup>21</sup> The process of eutrophication is driven by changes in the concentration of nutrients (i.e. phosphorous and nitrogen), which are indicated by the levels of dissolved oxygen, chlorophyll a, and transparency. See Tang, et al. (2020). Response of Eutrophication Development to Variations in Nutrients and Hydrological Regime: A Case Study in the Changjiang River (Yangtze) Basin. *Water*, 12, 1634 ([link](#)).

<sup>22</sup> Zhang, Y. et al. (2021). Estimation of nitrogen runoff loss from croplands in the Yangtze River Basin: A meta-analysis. *Environmental Pollution*, 272(116001) ([link](#)).

<sup>23</sup> Lebreton, L. et al. (2017). River plastic emissions to the world's oceans. *Nature Communications*, 8(15611) ([link](#)).

<sup>24</sup> Wang, Y. and Chen, X. (2021). River chief system as a collaborative water governance approach in China. *International Journal of Water Resources Development*, 36(4): 610-630 ([link](#)).

<sup>25</sup> The river chief system has become a prominent part of the institutional landscape and is based in the party-cadre system. See World Bank and DRC (2018). *Watershed: A New Era of Water Governance in China — Synthesis Report.* World Bank, Washington, DC



8. **The national program is articulated in the YREB Development Plan and the Action Plan for the Yangtze River Protection and Restoration,**<sup>26</sup> and aims to prioritize water and ecological protection, river basin coordination, and green development across the YREB. Subsidiary provincial plans outline the specific activities, expected results, and indicative targets related to these overarching objectives within each province. The PforR Program will support two such provincial plans: The Jiangxi “5-Rivers-1-Lake” Plan<sup>27</sup> issued in March 2019, and the Hunan “Integrated Water and Environment Management Plan for Dongting Lake Basin.”<sup>28</sup> issued in December 2018. These two target provinces are the borrowers under the PforR.

9. **The geographic scope of the Program differs by activity – with basin-, province-, sub-basin-, and county-level activities reflecting the differentiated responsibilities of government and nature of the activity.** The Program's geographic focus within Jiangxi Province is the Poyang Lake sub-basin. The target counties in Jiangxi under the PforR are the demonstration counties of Dayu county, Chongyi county, Yudu county, and Yongfeng county of Ji'an municipality; Yugan county of Shangrao municipality; and Fuliang county of Jingdezhen municipality.<sup>29</sup> Program's geographic focus within Hunan Province is the Dongting Lake sub-basin. The target counties under the PforR in Hunan are the demonstration districts and counties of Wancheng district of Changsha municipality, Miluo county-level city of Yueyang municipality, Ziyang district of Yiyang municipality, Shimen county of Changde municipality, and Yuanling county of Huaihua municipality.

10. **A Central Basin IPF (with the central government as the borrower) will further support Yangtze Basin-wide technical assistance activities aligned with the national strategy, the Yangtze River Law, and the provincial plans.** The Program thus has a layered geographic scope reflecting the tiered governance structure of the YREB national program. Activities supported by the Central Basin IPF include (1) establishment of a basin level river chief platform to promote the sharing of information, and establishment of a basin level coordination mechanism (a forum for decision making and coordination), (2) research on basin-wide management strategies for persistent sources of water pollution, including phosphorus, (3) research on policy options and mechanisms for ecological protection and restoration including ecological flows, (4) research support for "value realization mechanisms" (ecological incentives), and (5) activities to support technical capacity, trainings and knowledge exchanges, and program implementation support.

11. **The provincial PforR comprises three Results Areas supporting a nested hierarchy of activities.** The activities are aligned with the objectives of the Government program and include:

- **Results Area 1: Improving Institutions and Innovations (provincial level).** This Results Area will support institutional improvements for inter-jurisdictional cooperation and cross-sectoral coordination in Hunan and Jiangxi. Activities under Results Area 1 include:
  - i. Strengthen river chief system coordination via integration of county and municipal, provincial, and basin-level river chief system information platforms;
  - ii. Development of provincial level policies, regulations and guidelines on integrated water environment, ecological protection and plastic waste management; and
  - iii. Public engagement in water management, through pollution awareness campaigns, participatory management and river cleanup activities, development and dissemination of public engagement manuals for the river chief system.
- **Results Area 2: Advancing Ecological Protection through Integrated River Basin Management (sub-basin level).** This Results Area will support ecological protection and climate resilience of river and lake ecosystems in the



demonstration sub-basins of Gan River Basin (Jiangxi) and Yuan River Basin (Hunan). Activities under Results Area 2 include:

- i. Strengthening integrated water environment management systems, including development of water environment management plans for the sub-basins;
  - ii. Development of river health assessment and ecological flow guidelines based on national standards;
  - iii. Implementation of water allocation schemes for the sub-basins based on national standards; and
  - iv. Determination of ecological flow requirements and incorporation into county water allocations to ensure long term restoration and protection of the ecosystem services.
- **Results Area 3: Reduced Water Pollution and Transmission of Plastic Waste (county level).** This Results Area will support reduction of point- and non-point-source pollution in demonstration counties. This will contribute to the reduction of water pollution loads, including plastics, by improving the operation of township wastewater infrastructure, improving the management and utilization of livestock/poultry manure, and collecting and recycling plastic waste, in line with provincial policies in the demonstration counties. Activities under Results Area 3 include:
    - i. Improved integrated wastewater management services and collection systems at township level.
    - ii. Prevention of plastics entering waterbodies through collection and recycling of agricultural (plastic) mulch; and
    - iii. Reduced nutrient runoff via improved management and utilization of livestock/poultry manure.

12. **The PforR will exclude activities with potentially adverse impacts that are sensitive, diverse, or unprecedented on the environment and or affected people.** In addition, it will exclude activities that involve the procurement of: (i) works estimated to cost US\$75 million equivalent or more per contract; (ii) goods, information technology and non-consulting services estimated to cost US\$50 million equivalent or more per contract; or (iii) consulting services for firms estimated to cost US\$20 million equivalent or more per contract.

### C. Proposed Program Development Objective(s)

#### Program Development Objective(s)

13. **The PDO is to improve institutional coordination, enhance ecological protection and reduce water pollution in select regions of the Yangtze River Basin.** PDO level indicators are:

- *PDO#1: Strengthened river chief system for institutional coordination:* indicated by the number of county- and municipal-level information platforms connected to provincial-level platforms, plus the

<sup>26</sup> MEE and NDRC (2019). Action Plan for the Uphill Battle for the Conservation and Restoration of the Yangtze River ([link](#)).

<sup>27</sup> "5-Rivers-1-Lake" refers to the Gan, Fu, Xin, Rao and Xiu rivers that flow into Poyang Lake

<sup>28</sup> NDRC (2018). Integrated Water and Environment Management Plan for Dongting Lake Basin ([link](#)).

<sup>29</sup> Demonstration counties were selected based on a number of factors, including but not limited to: (a) a river chief system in place and either an existing management information platform or willingness to connect to the provincial river chief platform; (b) a long-term water environment protection plan or an equivalent plan under preparation; (c) plans to take innovative measures to ensure sustainability of program investments; and, (d) preference given to counties in the demonstration sub-basin.





number of provincial-level platforms connected to the basin-level platform (for integrated data sharing from local to basin scale).

- *PDO#2: Improved integrated water environment management system for the demonstration sub-basins*: indicated by the number of defined water environment management actions undertaken at sub-basin level, including (a) approval of sub-basin water environment protection plans; (b) enhancement of inter-jurisdictional coordination (that is, inter-provincial river chief cooperation agreement for Hunan and water environment information sharing platform for Jiangxi), and (c) compliance of ecological flows (meeting defined flow targets) on the mainstream and major tributaries, in each of the two demonstration sub-basins.
- *PDO#3: Annual targets for key pollutant reduction met*: indicated by the number<sup>30</sup> of key pollutant reduction targets met (yes/no) by the demonstration counties. The pollution reduction targets refer to (a) the number of demonstration counties that have established integrated wastewater service systems, (b) the weight (tons) of agricultural plastic film collected, and (c) the number of demonstration counties meeting their respective annual livestock/poultry manure utilization rate targets proportion of utilized livestock/poultry waste.

#### D. Environmental and Social Effects

14. **An Environmental and Social System Assessment (ESSA) was conducted to provide a comprehensive review of environmental and social (E&S) safeguards systems and procedures in China (including Jiangxi and Hunan Provinces).** The ESSA was conducted according to the following methodology: (i) screening for potential impacts from Program-supported activities; (ii) desktop review of relevant E&S laws, regulations, and procedures related to these activities across levels of governance; (iii) field visits to sites of typical Program-supported activities in selected counties including meetings with stakeholders (implementing agencies, government officials at provincial, county, township and village levels, and representatives of local communities). The draft ESSA in Chinese was locally disclosed in August 2021 and will be disclosed on the Bank's website prior to the completion of the appraisal.

15. **The ESSA considers the E&S risk associated with the PforR Program to be substantial.** The Program will have significant and broadly positive E&S effects in the Program's target regions. E&S screening was conducted on the proposed Program activities to exclude those with the potential to cause significant adverse impacts on the environment and/or people, including (i) activities involving closure or relocation of livestock, poultry or aquaculture farming; (ii) activities involving large scale land acquisition or access restrictions, including those that could impact vulnerable people; (iii) activities that have substantial impacts on river hydrology and ecology; and (iv) activities involving the allocation or conveyance of water. After applying these exclusion criteria, the Program will support pollution control and ecological restoration activities including county and township level wastewater treatment plants and pipelines, organic fertilizer subsidies, river waste cleanup, agricultural plastics collection and recycling, waste treatment of existing livestock farms, and institutional and capacity building activities.

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<sup>30</sup> There are three pollutant reduction targets for each of the two provinces each year for the period 2022–2026.





16. **The main potential impacts can be mitigated with appropriate measures.** Impacts identified include construction-related impacts such as dust, noise, disturbance of water bodies, soil erosion, wastewater and solid waste management, construction worker and community health and safety issues, small scale land acquisition or restrictions on land access, temporary land use; impacts during operation such as effluent discharge of wastewater treatment facilities, safe operation of project facilities, labor management issues, safe application of fertilizers and pesticides, impacts on farmers' livelihoods; and also the potential indirect impacts of technical assistance (TA) activities, such as financial impacts on vulnerable people due to new policies. These adverse E&S impacts are not significant, and can be identified and avoided, minimized, and mitigated through mature technologies and good management practices. OP 7.50 International Waterways or OP 7.60 Disputed Areas are not applicable to the Program.

17. **The ESSA concludes that China has established a comprehensive system for the management of E&S issues at both national and provincial levels, including in Jiangxi and Hunan province.** The system consists of laws, regulations, guidelines, specifications, and standards principally consistent with the World Bank's PforR Policy and Directive. This system provides an acceptable basis for addressing the possible environmental and social issues related to activities supported under the Program.

18. **The ESSA recommends that the PforR be used as an opportunity to strengthen the environmental and social management capacity of different stakeholders.** This could be achieved by: (i) promoting capacity building on E&S management at various levels of involved government authorities; (ii) providing training to farmers on fertilizer and pesticide use and livestock waste management; (iii) strengthening occupational health and safety (OHS) training and management for temporary workers in relation to construction and facilities' operations; (iv) improving monitoring mechanisms on livelihoods restoration for those who are affected by land acquisition; and (v) strengthening community engagement and public consultation, and maintenance of proper consultation and grievance redress records. Three of these recommendations have been included in the Program Action Plan (PAP), including the training on fertilizer use and agricultural waste management to farmers, strengthened OHS training and regular health checkups for all in-service workers, and establishment of a social impacts and risks screening, public participation, monitoring, and reporting mechanism with strengthened records management.

19. **In addition, relevant provisions of the World Bank Environmental and Social Framework have been applied to the central basin IPF, with E&S risks associated with the overall IPF rated as Substantial.** The central basin IPF is not anticipated to support physical activities, but to instead support basin studies on river health and ecological flows, development of guidelines related to key pollutants, such as phosphorus, research to inform implementation of the Yangtze River Protection Law, capacity building, support for institutional coordination mechanisms and information management, along with the compilation of Program results and reporting. Implementing the central basin IPF is assessed to have moderate social risks, related mainly to health and safety risks to field workers (e.g. researchers) and inadequate consultations with stakeholders. Supported activities are not considered likely to cause any direct adverse environmental impacts. However, there could be basin-wide downstream E&S implications related to the implementation of the products or outcomes of the technical assistance, including environmental impacts from new construction, rehabilitation, and operation of wastewater and solid waste collection and treatment facilities, labor risks, community health and safety, restrictions on land use, resettlement, and exclusion risks for vulnerable groups, among others.

20. **The relevant provisions of the World Bank Environmental and Social Framework have been applied to address these risks, and the relevant instruments disclosed.** An Environmental and Social Management Framework (ESMF), a Stakeholder Engagement Framework (SEF) and an Environmental and Social Commitment Plan (ESCP) were prepared by



the CPMO in accordance with the requirements of the ESF and disclosed on July 25, 2021.<sup>31</sup> Both the ESMF and the SEF provide operational guidance for applying relevant ESSs to TA activities, creating added value for enhancing the operability of policy recommendations while incorporating considerations on significant E&S risks. The ESCP documents the material E&S measures and actions to identify, assess and mitigate E&S risks and impacts (including downstream risks) in connection with the TA activities. The updated and final ESF instruments (including ESMF, ESCP and SEF) have been disclosed locally and on the World Bank’s website.

Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

Summary of Assessment of Environmental and Social Risks and Impacts (With IPF Component for PforR)

**E. Financing**

21. **Total program financing over the 2022-2026 period is expected to be US\$ 6,526 million, of which an expected US\$6,126 million (93.87 percent) will be financed by the Government and US\$ 400 million (6.13 percent) by the proposed IBRD loan.** Of the US\$ 6,126 million government financing, it is estimated that US\$ 2,519 million will come from Jiangxi Province and US\$ 3,607 million will come from Hunan Province.

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<sup>31</sup> <http://www.cjw.gov.cn/zwzc/qsqg/56781.html>



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