



Program Information Documents (PID)

Appraisal Stage | Date Prepared/Updated: 23-Feb-2022 | Report No: PIDA259275

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

Country China	Project ID P177590	Program Name Green Agricultural and Rural Revitalization Program for Results - Phase I	Parent Project ID (if any)
Region EAST ASIA AND PACIFIC	Estimated Appraisal Date 14-Feb-2022	Estimated Board Date 31-Mar-2022	Practice Area (Lead) Agriculture and Food
Financing Instrument Program-for-Results Financing	Borrower(s) PEOPLE'S REPUBLIC OF CHINA	Implementing Agency Foreign Capital Division, Guizhou Provincial Rural Revitalization Bureau, Foreign Project Management Center, Guangxi Agriculture and Rural Affairs Department	

Proposed Program Development Objective(s)

The Program Development Objective (PDO) is to enhance environmentally sustainable agricultural and rural infrastructure development in selected areas of Guangxi and Guizhou.

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

Government program Cost	5,016.00
Total Operation Cost	5,016.00
Total Program Cost	5,016.00
Total Financing	5,016.00
Financing Gap	0.00

FINANCING (USD Millions)

Total World Bank Group Financing	320.00
World Bank Lending	320.00



Total Government Contribution	4,696.00
Decision	
The review did authorize the team to appraise and negotiate	



B. Introduction and Context

Country Context

1. **After 40 years of rapid economic growth, China eradicated absolute poverty in 2020.** According to the last accessible household survey data from 2018, the share of people living below the extreme international poverty line of US\$1.90 per day had fallen below 1 percent. Despite this remarkable achievement, however, economic vulnerabilities remain widespread especially, although not exclusively, in rural areas.
2. **Close to one fifth of China's population remains economically vulnerable, two thirds of them are in rural areas.** Around 250 million Chinese remain below the US\$5.50 poverty line recommended for Upper Middle Income countries (MICs), of which two thirds reside in rural areas. Around 40 percent of China's population (570 million people) live in rural areas. Many of them are vulnerable to falling back into poverty in case of an economic shock or natural disaster.
3. **China's rural economy is challenged by natural and human resource constraints, and institutional weaknesses which reduce the effectiveness of ample government support.** China has limited natural resource endowments. For example, water availability is only eight percent of global water resources and arable land is 13 percent of the world total. Small farm sizes (93 percent of farms are less than 1 hectare) and ageing farmers (averaging about 54 years) are constraining agriculture modernization. Under-investment in agriculture and rural public services, such as research and development (R&D),¹ extension and advisory services, storage and cold chains, and vocational skills development, adversely impact labor and land productivity. Given these constraints, rural incomes continue to lag significantly, despite considerable investments in rural infrastructure, including rural roads, water and sanitation, irrigation and drainage systems. Limited institutional and governance capacity at the subnational level (e.g., program budgeting, targeting of poverty and farm support, monitoring and evaluation (M&E)) and weak farmer organizations (e.g., farmer cooperatives, water user associations) continue to hamper the efficient delivery of rural public services and development of viable agro-food enterprises.
4. **Moreover, China's past rapid agriculture growth has come at the cost of increasing environmental degradation and natural resource depletion.** It is estimated that the cost of environmental degradation and resource depletion in China amounts to about 9 percent of its GDP, 10 times higher than corresponding levels in Korea and Japan.^{2,3} China was ranked 120th out of 180 countries for environmental performance across 24 indicators in ten categories, including: air quality, water and sanitation, heavy metals, biodiversity and habitat, forests, fisheries, climate and energy, water resource and agriculture. The environmental performance index (EPI) shows that China is lagging many other upper MICs, such as Brazil, Mexico, Russia, and Turkey, with comparable per capita incomes.
5. **To put rural development on a more sustainable and at the same time greener footing, China adopted the Rural Revitalization Program (RRP, 2018-2050) in 2017.** The RRP is being implemented through a series of five year Rural Revitalization Strategic Plans (RRS), which form the basis for the proposed operation. Program objectives and milestones

¹ The ratio of agricultural R&D expenditures to agricultural GDP increased from 0.14 in 2002 to 0.46 in 2018, but still significantly lower than that of developed countries, which average between 1 and 2.

² World Bank and State Environmental Protection Administration (2007). Cost of pollution in China.

³ World Bank Group and DRC (2018). "China 2030: Building a Modern, Harmonious and Creative Society." The World Bank and Development Research Center of the State Council, the People's Republic of China.



have been further elaborated in annual policy documents⁴ and in the 14th Five-Year Plan (FYP, 2021-2025) for the National Green Development of Agriculture⁵ (for further details, see below on the Government Program).

6. **Despite the greater prominence given to green agricultural development in national planning documents, in practice the government's rural revitalization and greening objectives are not fully coordinated.** Central and regional/provincial government transfers targeting rural revitalization do not consider green, low carbon and sustainable agriculture and rural development as primary objectives. Instead, agricultural support policy measures (e.g., input subsidies, guaranteed purchase schemes, cheap credit etc.) have been tied to farmland area, production volumes and yields, without considering environmental costs and benefits. Moreover, critical funding gaps remain for some rural public services, especially rural wastewater and solid waste management. Thus, there is an urgent need for developing new governance frameworks for mobilizing fiscal resources (and tracking expenditures), which can be transferred to counties to achieve specific targets for the green, low carbon and sustainable agriculture and rural development objectives.

7. **The adoption of green technologies and practices by farmers and producer cooperatives is further hampered by perverse incentives, commercial risks and insufficient farm-level knowledge.** Specifically, farmers face the following challenges: (a) input-oriented subsidies encourage the use of more harmful chemical agricultural inputs, especially fertilizer and pesticide in crop production than necessary; (b) climate-smart agricultural technologies and practices, including the use of formula fertilizer, fertigation, organic and green manure, and livestock and poultry manure treatment and recycling facilities require upfront investments and risk-averse and credit constrained farmers are reluctant to switch; (c) farmers need extensive technical training and capacity building to fully master the details of green agricultural technologies and practices, but the local institutional capacity to deliver such knowledge is limited; and (d) farmers find it difficult to recoup the costs of production of green agricultural products, unless they are certified as green or organic, or registered as geographical indication (GI), and are sold in niche markets, where consumers are willing to pay premium prices.

8. **Guangxi and Guizhou are among the poorest provinces in China, and are well-suited for this operation.** With GDP per capital at around US\$6,700 and US\$6,400 in 2020, respectively, Guangxi and Guizhou are among the bottom four poorest provinces out of China's 31 administrative regions. Agriculture continues to be a sizeable part of their economies, with larger than average rural populations in both provinces, and agro-climatic conditions are similar. Between 2015 and 2020, Guangxi and Guizhou's poverty rates went from 10.2 percent and 7.8 percent to 0.6 percent, faster than the national average, partly with support from the Bank. Using the Program for Results (PforR) instrument, the Bank supported Guangxi's poverty reduction program, focusing on better targeting, access to services and more integrated M&E from 2018 to 2021. The Bank also piloted a value chain approach to increase income generation opportunities for the rural population through the Guangxi Rural Poverty Alleviation Pilot project. Similarly, in Guizhou, through the Guizhou Rural Development Project, the Bank supported agricultural modernization through improved organizational arrangements and strengthened public services delivery. These past successful interventions, their predominantly rural profile, similar agro-climatic conditions and dominant agricultural value chains, make Guizhou and Guangxi well-suited provinces selected for phase 1 of this PforR, which combines rural revitalization with greening of agricultural production at provincial scale. Based

⁴ Traditionally, the first Central Document issued by the Central Committee of the Communist Part of China (CPC) and the State Council (SC) each year has been focused on agricultural reforms and modernization of the rural economy.

⁵ A joint notice of the Ministry of Agriculture and Rural Affairs, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Natural Resources, Ministry of Ecology and Environment, and National Forestry and Grassland Administration (Nong Gui Fa [2021] No. 8) issued in August 2021.



on experiences gained in this operation, the approach is expected to be extended to additional provinces with different agricultural value chains in future years.

9. **The Green Agricultural and Rural Revitalization (GARR) PforR also provides incentives for strengthening institutional delivery mechanisms to ensure a sharper focus on green agricultural development and rural development results**, whilst keeping the focus on poor and vulnerable households in Guangxi and Guizhou. It also provides additional incentives to leverage the World Bank financing to enhance the efficiency and impact of the phased Rural Revitalization Strategic Plans (RRS), through improvements in governance frameworks, such as the platforms for program-based budgeting and public expenditure tracking, monitoring and evaluation (M&E), and verification of results.

Sectoral and Institutional Context

Green Agricultural Development

10. **China has one of the largest agricultural sectors in the world.** In 2020, China's agricultural GDP amounted to US\$1.13 trillion (constant 2010 US\$), equivalent to 7.7 percent of the national GDP. Agricultural GDP increased 4.5 percent per year on average over the past 40 years, driven mainly by higher total factor productivity (TFP), the introduction of new technologies and large producer subsidies, mostly for rice, wheat and maize production, which today exceed levels in the European Union (EU) and the United States (US). Despite its limited natural resource endowment, China produces about 18 percent of the world's cereal grains, 29 percent of the world's meat, and 50 percent of the world's vegetables. China also plays an important role in international agricultural trade. The country is the largest importer of soybeans, maize, beef and aquatic products, and is the largest exporter of chemical fertilizers. As a large producer, consumer and trader, China's producer support and international trade policies have huge global implications.

11. **China is the largest global emitter of greenhouse gases (GHG) from agriculture, accounting for 13 percent of the total.**⁶ The main sources of China's agricultural GHG emissions include enteric fermentation from ruminant animals (28.7 percent), excessive or improper synthetic fertilizer use (21.8 percent), paddy rice cultivation (16.0 percent), and poor livestock waste (manure, sewage and urine) management (10.5 percent). The agriculture sector emits an estimated 828 million tons of carbon dioxide (CO₂) equivalent per year.⁷ ⁸ Climate models estimate that without serious national mitigation efforts, agricultural emissions in China will rise to 1,350 million tons per year by 2050. In 2018, the agriculture sector in China accounted for about 11 percent of the country's GHG emissions—the third largest source after energy and industry.

12. **At the same time, excessive use of chemical fertilizers is one of the major non-point sources (NPS) of water pollution in China.** The country is now the largest chemical fertilizer user globally, both in absolute terms and per unit of land. Most of these fertilizers are not taken up by the targeted plants, but instead disperse through the air, soil, and water. About 67 percent of monitored groundwater sites are polluted and 32 percent of major rivers fail to meet basic quality standards required for sources of drinking water supply. About 7 percent of irrigated lands is contaminated with polluted water. The National Sustainable Agricultural Development Plan (2015–2030) targets zero growth of fertilizers as part of efforts to combat NPS pollution and to reduce GHG emissions; and since 2015 the amount of chemical fertilizer use has been declining. Nonetheless, the amount of fertilizer applied per unit area in China is still about five times that of EU, three

⁶ The main agriculture and land use change GHG emissions are carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O)).

⁷ According to China's Third National Communication to the UNFCCC of December 2018. Although this is the official figure reported by China, other sources such as [Climate Watch](#) put the level of China's agricultural sector emissions closer to 730 million tons.

⁸ The social cost of carbon is a measure of the economic harm from those impacts, expressed as the dollar value of the total damages from emitting one ton of carbon dioxide into the atmosphere. The current central estimate of the social cost of carbon is over US\$50 per ton in today's dollars



times the global average, and twice that of the US. Thus, there is a potential for cutting nitrogen applications by 30–60 percent without reducing yields in China’s major grain producing areas.

13. **Untreated manure from livestock and poultry operations is also one of the major sources of water pollution in China.** In 2017, pollutants measured in terms of the country’s total Chemical Oxygen Demand (COD), total Nitrogen (TN), and total Phosphorus (TP) were 21.44, 3.04, and 0.32 million tons,⁹ respectively. Agricultural sources accounted for 50 percent, 47 percent, and 67 percent of these pollutants, respectively. The livestock subsector is the major contributor of water pollution in China, accounting for 96 percent of the COD, 38 percent of TN, and 56 percent of TP. Since 2016, the government has implemented efforts to increase the treatment rate of animal manure, setting a target of 80 percent in the latest 14th FYP. In 2020, the recycling rate of livestock and poultry manure was about 75.9 percent. The untreated livestock and poultry manure discharged into water bodies cause a sharp decline in soluble oxygen leading to eutrophication and algae blooms. As a result, water quality is compromised, and aquatic biodiversity is altered. Untreated manure may also increase the concentration of nitrates in groundwater due to leakage of nutrients. Untreated manure is also a major source of air pollution in form of hazardous gases (e.g., Ammonia (CH₃) and Hydrogen Sulphide (H₂S) and GHGs (e.g., CO₂, CH₄ and N₂O), as well as stench and dust.

14. **The low rate of recycling agricultural plastics is another major environmental challenge.** China has the largest agricultural area under plastic film mulch in the world. This is mainly because of its rapid expansion into fruit and vegetable production – a response to dietary diversification locally and abroad. Over the last two decades the area under plastic film in China grew more than 150 times and reached over 20 million hectares, using nearly 1.2 million tons of plastic films. In 2020, the recovery rate of agricultural film was 80 percent. However, the recycling rate of plastic mulch was less than 60 percent (14th FYP target is 85 percent). The environmental impact of this practice is ambiguous. On the one hand, plastic film mulching has played an important role in China’s agriculture development due to its ability to warm soil, retain moisture and reduce pesticide residues in soil. Over time, this has significantly increased crop yields (e.g., 20-35 percent in grains and 20-60 percent in cash crops) and hence farm incomes. On the other hand, the widespread use of plastic film mulching has generated large quantities of plastic waste. Improper collection, treatment and disposal of agricultural plastics contributes to air, water, and soil pollution, as well as ecosystem degradation. Large quantities of plastic film mulch have ended up in streams, rivers and ultimately the World’s oceans--endangering wildlife. While the policy framework with respect to plastic collection and recycling, and the use of micro-thin plastics in agriculture, has recently tightened, enforcement in rural areas remains patchy at best. In 2019, the government put forth “opinions” on accelerating the prevention of agricultural mulch pollution.¹⁰ The document sets several high-level targets, including that by 2020, the area covered in plastic film will cease to grow, and that 80 percent of mulch films will be collected and recycled. And by 2025, the policy aims for nearly all agricultural membranes to be recovered, and for plastic film residues to decline. In 2020, China introduced a roadmap for phasing out reliance on a variety of short-lived plastics by 2025. Its multiple prongs include measures to reduce and replace plastics with degradable mulch, increasing recycling rates, improving plastics management, and investing in science and technology.¹¹

⁹ FAO (Food and Agriculture Organization of the United Nations). 2021. FAOSTAT [EB/OL]. <http://www.fao.org/faostat/en/#data,2021-07-10>.

¹⁰ Opinions of the Ministry of Agriculture and Rural Affairs, the National Development and Reform Commission, the Ministry of Industry and Information Technology, the Ministry of Finance, the Ministry of Ecology and Environment, and the State Administration of Market Supervision and Administration on accelerating the prevention of Agricultural Mulch Pollution. Release date: July 04, 2019

¹¹ [NDRC] National Development and Reform Commission. 2020. “About the Ministry of Ecology and Environment of the National Development and Reform Commission.



15. **Agriculture not only contributes significantly to China's GHG emissions, but it is also highly vulnerable to climate change.** Despite this, agriculture is one of the few sectors for which China has not developed an overall strategy on climate adaptation. Increasing severity and frequency of extreme weather events (especially floods and droughts), rising sea levels, destruction of ecosystems, and loss of biodiversity will significantly weaken China's agricultural production capacity. For every 1 degree increase in temperature from the historical level, global food production, including rice, maize, and wheat, will decrease by 3 percent to 10 percent.¹² Mountainous areas of Guangxi and Guizhou region/provinces are exposed to extreme events, such as heavy rains and floods and to lesser extent longer dry spells on a seasonal basis, as well as climate variability. Guangxi is also characterized as a high flood risk and medium water scarcity risk region/province, especially in karst mountain areas, where majority of the rural population is located. In both Guangxi and Guizhou, areas with medium with medium water scarcity could potentially transition into more adverse condition with climate-induced drought, affecting crops. Mountainous conditions combined with average annual rainfall of 1,500 to 2,000 mm could result in floods and landslides, which could damage rural infrastructure. These climate-induced hazards may increase in the future because of climate change. Thus, the adoption of climate-smart agricultural practices would be critical for sustainably increasing agricultural productivity, building resilience to climate change, and reducing GHG emissions. In addition, construction of climate-resilient rural infrastructure will enhance their sustainability.

16. **The Green Agricultural and Rural Revitalization (GARR) PforR will support China's efforts to reduce the agricultural environmental footprint from the three major sources:** (i) excessive or improper chemical fertilizer and pesticide use; (ii) poor livestock and poultry manure management; and (iii) overuse and improper disposal of agricultural plastics. These are the major source of water (point and non-point source), soil, and air pollution in China. The GHG emissions from these activities also contribute to global warming and climate change. Additional co-benefits will be realized by adopting climate-smart agricultural practices, including technologies that increase irrigation water use efficiency (e.g., fertigation, drip irrigation) and return crop straws to soil. Thus, developing standards, regulations and guidelines for green agricultural development, together with their enforcement mechanisms would be critical.

Rural Infrastructure

17. **Despite China's massive investments in infrastructure and public services, there is still a wide gap between urban and rural areas.** With respect to key pollution related risks, the priority are investments in rural solid waste and wastewater management. These are the priority areas under Results Area 3 of the GARR PforR. Additional needs relate to the shortage of agricultural processing infrastructure and cold storage, reducing the value added in local food production and hence income generating opportunities. In addition, public services such as animal health and veterinary services, extension and advisory services, business development services, and marketing services, including e-commerce are inadequate. These needs are supported in the context of strengthening green agricultural value chains under Results Area 2 of the GARR PforR.

18. **One of the cross-cutting challenges in addressing rural infrastructure and service gaps is the low capacity for infrastructure planning, prioritization, and life-cycle operation and management of local infrastructure assets.** Following guidelines issued by the State Council in 2019, the improvement of rural infrastructure at the village level is promoted through the development of Integrated Village Development Plans (IVDPs). The GARR PforR supports the development of such plans as a key instrument to address local needs in a differentiated way, build local capacity and strengthen accountability to improve the management of public services. The GARR PforR also draws on prior experience in rural

¹² Challinor, A. J., Watson, J., Lobell, D. B., Howden, S. M., Smith, D. R., & Chhetri, N. 2014. A meta-analysis of crop yield under climate change and adaptation. *Nature Climate Change* 4 (4): 287–91.



poverty reduction in building stronger IT-based M&E systems for the management and operation, as well as performance evaluation of rural infrastructure assets.

Rural Solid Waste Management

19. **Rural solid waste collection and treatment falls way behind levels in urban areas.** In 2019, waste generation was estimated at 0.76 kg/capita/day in rural areas. However, up to half of the rural solid waste may not be disposed safely, thus turning into a major source of environmental pollution¹³. While urban waste collection is almost universal, in 2017, it was estimated that only 47 percent of the rural waste was disposed according to the existing national standards¹⁴. In 2018, the Ministry of Agriculture and Rural Affairs (MARA) reported that rural solid waste was not properly managed in at least a quarter of administrative villages in China, where open dumping was normal, and littering was ubiquitous¹⁵. China is currently piloting separation of rural solid waste into four (i.e., organics, recyclables, hazardous, residual) categories at source. In rural areas, kitchen (organic) waste is mostly used by households as animal feed, and recyclables are partially collected outside the public service (e.g., by informal and private sector due to low profit margins and long transport distance). But residual waste and hazardous waste often remain uncollected and either littered to the environment, placed at informal dumpsites or burnt by the population. Separating rural solid waste at source would also facilitate the collection and recycling of agricultural plastic (e.g., plastic mulch film residues, pesticide containers, and chemical fertilizer packages).

20. **China has put in place several policies and plans for improving rural solid waste management.** In 2015, the *Opinions on Comprehensive Implementation of Rural Solid Waste Management* issued by the Ministry of Housing, Urban and Rural Development (MOHURD) and ten other ministries requires localities to establish rural waste management systems that follow the management modality of “waste collection by villages, transfer by towns, and treatment by counties.” In 2018, the State Council (SC) issued a *Three-Year Action Plan for Rural Living Environment Improvement (2018-2020)*, promoting the establishment of a comprehensive and diverse rural waste management system centered around waste minimization and recycling. The Plan also sets the target of 90 percent coverage of solid waste collection facilities in administrative villages nationwide by end of 2020.¹⁶ However, many provinces report that this target is yet to be achieved and that unauthorized dumping of waste continues at scale. Waste collection facilities (e.g., collection containers and pads) often remain idle due to the unavailable waste flow chain. The latter includes transfer stations, storage facilities, treatment facilities, and financing and institutional capacities that ensure the waste is managed holistically from generation to final placement. Recognizing these challenges, the *14th FYP on Municipal Solid Waste Separation and Treatment Facilities Development Plan* (National Development Reform Commission (NDRC)/MOHURD, 2021-2025) envisages rural waste management to gradually integrate with the urban system. In June 2020, MOHURD launched a nation-wide program to pilot urban-rural integrated waste management and rural waste separation¹⁷ in 141 demonstration counties. In April 2021, MOHURD issued the *Standards for Rural Municipal Solid Waste Collection, Transfer and Treatment*, setting up standards and technical specifications for the construction and operation of rural systems of segregated waste collection, transfer, and treatment, while considering diverse local conditions.

¹³ Urban and Rural Municipal Solid Waste in China and the Circular Economy, World Bank (2019)

¹⁴ China Association of Urban Environmental Sanitation, the China Municipal Waste Development Report (October 2017)

¹⁵ http://www.xinhuanet.com/gongyi/2018-09/30/c_129964054.htm

¹⁶ Coverage of waste collection infrastructure, e.g., collection bins and pads, should not be confused with service coverage of the population, assessed to remain far below.

¹⁷ http://www.mohurd.gov.cn/wjfb/202006/t20200624_246034.html



21. **Although the rural solid waste policy framework has been tightened in the past five years, enforcement remains a key challenge.** This is partly due to the fragmented institutional authority over, and responsibilities for rural solid waste services. MOHURD is responsible for planning, construction, and operation and maintenance (O&M) of solid waste management facilities, service delivery, and data and information management. The Market and Supply Cooperative (COOP), a nationwide network, handles resource recycling in rural areas. MARA organizes the treatment of agricultural wastes, including agricultural mulch film and plastic packaging. Environmental monitoring and compliance of solid waste management and resource recycling facilities is the responsibility of the Ministry of Ecology and Environment (MEE). Given that there are several institutions with different mandates, an effective institutional coordination framework is needed to better manage rural solid waste.

22. **The Green Agricultural and Rural Revitalization PforR will focus on rural solid waste collection and sorting in villages, and transfer to townships waste handling facilities.** The PforR will not support county-level solid waste treatment because incineration and landfills are high environmental risk activities. The PforR complements a series of Bank-funded operations aimed to abate solid waste and plastic pollution in rural areas, as described in Box 1.

Box 1. Evolution and Complementarity of IBRD Operations for Pollution Abatement in Rural Areas

Point source pollution control in China has improved through significant investment in collection and treatment of domestic wastewater, with urban wastewater treatment rate increasing from 15 percent in 1991 to over 95 percent in 2020. Most of these improvements have occurred in urban areas, in particular large cities. The situation is different in rural areas, where challenges remain in rural point source and agricultural non-point source pollution, giving rise to persistent pollutants driving non-compliance with water quality standards – primarily organic matter (COD), nitrogen, and phosphorus. Plastic pollution, which is at the origin of the global marine plastics problem, follows similar patterns, with plastic collection and recycling improving in cities but lagging far behind in small towns and rural areas.

Recently approved IBRD operations are focusing on helping the Chinese government and provincial and county authorities enhance solid and plastic waste management and wastewater treatment policies and institutions, and invest in physical pollution abatement in the rural space.

The Hubei Smart and Sustainable Agriculture Project (P168061) approved in FY20 promotes integrated environmentally sustainable and climate-smart agriculture, and agri-food quality and safety, in targeted value chains and landscapes in Hubei Province. This includes preventing and mitigating pollution from heavy metals and plastics

The Plastic Waste Reduction Project (P174267) approved in FY21 improves plastic waste management at the national and sub-national level, and reduces plastics pollution from municipal solid waste. This project would be followed by a second one in FY23 which would continue to improve the policy framework while also investing in plastic abatement in rural areas.

The Food Safety Improvement Project (P162178) approved in FY21 supports food safety management at the national and targeted subnational levels and reduce food safety risks in selected value chains, including due to contamination of soil and water through a range of contaminants, including plastics.

The Yangtze River Protection and Ecological Restoration Program (P171644) approved in December 2021 improves institutional coordination, enhances ecological protection and reduces water pollution loads in select regions of the Yangtze River Basin, including from uncollected or mishandled rural waste and agricultural plastics. A follow-on project is planned.

The Yellow River Basin Ecological Protection and Pollution Control Program (P172806) under preparation, and proposed for approval in FY22, is expected to improve institutional coordination, enhance ecological protection and reduce water pollution loads in select regions of the Yellow River Basin. This would entail reducing marine plastics pollution through improved collection and treatment of wastewater treatment, and improved agricultural practices



Rural Wastewater Management

23. **Rural wastewater collection, treatment and recycling has increasingly become a major concern in China.** In 2018, there were 2.45 million villages in China with a total population of 580 million.¹⁸ Simple pit latrines and flush toilets connected to septic tanks are commonly used in rural areas. But still many villagers face poor sanitation and hygiene conditions because of inadequate, outdated, and/or faulty sanitary facilities. The sewage generated in these villages each day is approximately 17.6 million m³, but the daily treatment capacity is only around 494,700 m³, which means that only 2.8 percent of wastewater is treated.¹⁹ The untreated wastewater discharged into the environment generates all kinds of health risks and NPS water pollution—due to higher content of COD, TN, TP and ammonia nitrogen (NH₃N).

24. **China has several policies and programs for improving rural wastewater treatment systems (WTS).** The ‘*Plan for Preventing Water Pollution*’, published by the SC in 2015, requires the rural WTS to use standard design for construction and management. These unified standards have led to over-designed rural wastewater infrastructure with little prospect for recouping investment and meeting O&M costs. Going forward, rural WTS design standards need to be customized to fit local conditions. The 13th FYP (2016–2020) set a target for rural wastewater treatment rate of over 60 percent²⁰ by end of 2020. However, despite increased subsidies and vigorous promotions from the central government, only about 25 percent of villages in China have WTS.²¹ Many of these WTS are not fully functional because of unsuitable technology, insufficient financial resources for O&M, ineffective governance structure, weak institutional capacity for enforcing effluent discharge standards, and limited public participation. Due to the scattered villages and difficult terrain in some part of the country, the logistics of transferring large volumes of wastewater remain challenging.

PforR Program Scope

25. **The PforR will be implemented in the Guangxi Zhuang Autonomous Region and Guizhou province.** The two mountainous provinces are in the southwest of China. Guangxi is situated in China's southern frontier area, facing Beibuwan Gulf in the south (total length of the coastline is about 1,500 km) and bordering Vietnam on the southwest. Guangxi province covers an area of over 236,700 km square. Guizhou is a landlocked province covering an area of over 176,167 km square. The two provinces are among the least developed provinces of China, and agriculture still plays a critical role in their economies.

I. Guangxi Zhuang Autonomous Region

26. **Guangxi has a population of 50.19 million people, of which about 37 percent belong to various ethnic minorities (predominately Zhuang, accounting for 31 percent).** In 2020, Guangxi's total GDP was estimated at CNY 2,215.7 billion (US\$346.20 billion equivalent), ranking 19th out of 34 provinces/autonomous regions in the country. With a per capita GDP of CNY 44,201 (US\$6,906.40 equivalent), Guangxi ranks 29th in the country, among the 34 provinces/autonomous regions. In 2020, the agricultural production reached: rice (10.14 million tons), vegetables (38.31 million tons), sugarcane (74.13 million tons), and fruits (27.86 million tons). These four major crops are heavy users of chemical fertilizer, pesticides, and agricultural plastic films. Guangxi is among the top ten largest users of chemical fertilizer and pesticides and agricultural plastics in China. In 2020, the total sown area of crops in Guangxi was 6.11 million hectares. The total use of chemical fertilizers (nutrient) was 2.48 million tons, while the use of pesticides was 66,026 tons, ranking eighth and seventh in the

¹⁸ Ministry of Housing and Urban–Rural Development of the People's Republic of China 2018 Chinese Urban–Rural Construction Statistical Yearbook (2018). China Planning Press, Beijing (in Chinese).

¹⁹ Ibid

²⁰ In 2018, Zhejiang and Jiangsu provinces, and Shanghai and Beijing municipalities had more than 70 percent of the villages with WTS.

²¹ National Bureau of Statistics of China 2018 China Statistical Yearbook (2018). China Statistic Press, Beijing



country, respectively. During the same time, the use of agricultural plastic and plastic film was 48,712 tons and 34,678 tons, ranking 19th and 13th in the country, respectively. The total area covered by plastic film was 432,900 hectares, ranking 13th in the country.

27. **Guangxi is also one of the larger producers of livestock and poultry in China.** The subsector is dominated by the pig and poultry industries. In 2020, about 28.12 million pigs and 1.15 billion poultry were slaughtered, respectively. During the same year the standing pig population was 18.28 million. Guangxi ranks 12th and fourth in pig and poultry production in the country, respectively. In addition, Guangxi ranks 12th and 18th in mutton and beef production in China, respectively. These livestock and poultry production systems are generating significant amounts of manure, which need to be better managed. During the 13th FYP, Guangxi government actively promoted the utilization of livestock and poultry manure; and the zero-growth action of chemical fertilizer use. By 2020, the standing pig population declined by nearly 40 percent due to the African Swine Fever (ASF) outbreak in 2018. The ongoing recovery of the pig production is projected to significantly increase the amount of manure in the next decade. Thus, more investments are needed to further improve the management of livestock and poultry, including in facilities for the collection, treatment and recycling of manure.

II. Guizhou Province

28. **Guizhou Province has a total population of about 40 million, of which about 40 percent belong to various ethnic minorities.** In 2020, Guizhou's GDP was estimated at CNY 1,782.6 billion (US\$278.53 billion equivalent), ranking 20th in the country; and the per capita GDP at CNY 46,207 (US\$7,219.84 equivalent), ranking 25th in the country. Guizhou's crop production is dominated by vegetables, fruits and paddy rice. In 2020, the province produced vegetables (29.91 million tons), fruits (5.48 million tons), and paddy rice (4.16 million tons). These crops use significant amounts of chemical fertilizer, pesticides and agricultural plastic films. In 2020, the total sown area of crops in Guizhou was 5.48 million hectares. Guizhou uses significant amount of chemical fertilizer, pesticides and agricultural plastics. The amounts of chemical fertilizer (in nutrient) and pesticide used were 788,000 tons and 8,423 tons, ranking 23rd and 25th in the country, respectively. The amount of agricultural plastic film used, and the area covered by plastic film were 45,411 tons and 371,500 hectares, ranking 21st and 16th in the country, respectively. Guizhou province reported that in 2020 the recovery rate of agricultural plastic was 83.56 percent.

29. **Guizhou is also one of the large livestock and poultry producing provinces in China.** The subsector is dominated by poultry and pig production, although cattle and sheep populations are also increasing. In 2020, the province slaughtered a total of 16.61 and 176.02 million pigs and poultry, respectively. In the same year, the standing pig population was 13.64 million. Nationally, Guizhou ranks 13th and 20th in pig and poultry production, respectively. The pig population is currently on the rise because the ASF is largely under control. There is also a rapid expansion of poultry production, targeting the Greater Bay Area (Guangdong–Hong Kong–Macau) and the relatively richer eastern provinces markets. The quantity of livestock and poultry manure is projected to increase steadily in the next decade. Therefore, improving the management of the manure remains one of the key priorities of the Guizhou government. According to the Guizhou province's monitoring reports, the livestock and poultry manure utilization rate in 2020 was 86.43 percent. While there has been some improvement in the management of manure, which is one of the major sources of water, soil and air pollutants, more investments are needed to achieve the pollution reduction targets set in the 14th FYP.

Program Boundary

30. **The PforR will support selected sub-programs under Pillar 1 - Green agricultural development and Pillar 3 - Rural infrastructure and public services of the government's RRS plan phase 1 (2018-2022), which overlaps with the 14th FYP (2021-2025).** The PforR will be implemented over a six year period from FY2023-2028. The PforR will be implemented in



12 counties in Guangxi (out of 111 counties) and 15 counties in Guizhou (out of 86 counties). In Guangxi, the selected counties/districts include: Pinggui, Ziyuan, Luocheng, Tiandeng, Rong'an, Xingbin, Xincheng, Tiandong, Bobai, Yizhou, Mashan and Zhongshan. In Guizhou province, the selected counties/districts include: Bijiang, Sinan, Yinjiang, Songtao, Jinping, Shibing, Taijiang, Luodian, Guiding, Sandu, Libo, Xingren, Zhenfeng, Xiuwen, and Xifeng. These counties/districts were selected based on agreed criteria.

31. **The PforR will support three Results Areas (RAs) to be implemented in Guangxi and Guizhou:** (i) Strengthening institutional capacity for governance; (ii) Greening agricultural value chains; and (iii) Increasing access to rural solid waste and wastewater services. These RAs are briefly described below.

32. **RA1 - Strengthening institutional capacity for governance.** The RA1 aims at putting in place governance and training and capacity building frameworks needed to enhance the effectiveness of the government's phased RRS plans. Activities under RA1 include: (i) developing provincial regulations, standards and guidelines for green agricultural development; (ii) establishing provincial mechanisms for green agricultural development program-budgeting, expenditure tracking and reporting; (iii) establishing provincial mechanisms for M&E of rural infrastructure and public services; and (iv) developing provincial frameworks/action plans for nurturing green skills and talents in rural areas. The provincial regulations, standards and guidelines will strengthen the legal framework for green agricultural technologies and innovations; and mechanisms for regulating agricultural inputs and livestock and poultry waste management. The program-budgeting and expenditure tracking framework are critical for transparently allocating fiscal resources, based on delivery of verifiable results; and for enhancing accountability, through the established performance evaluation and reporting of expenditures. Similarly, the development of green skills and talents is key to accelerating the adoption of GAP to reduce the sector's environmental footprint. The provincial governance frameworks and institutional capacity building action plans will be piloted in the 27 GARR PforR counties/districts and scale up province-wide and shared nation-wide.

33. **RA2 - Greening selected agricultural value chains.** The RA2 aims to sustain and consolidate the poverty reduction gains by supporting environmentally-friendly agricultural production practices and value addition activities to increase rural incomes (farm and off-farm). The RA2 will support climate smart agricultural practices in selected value chains. The aim is to achieve the triple-wins: increase productivity, build resilience to climate change, and reduce GHG emissions. Activities under RA2 include: (i) strengthening the protection and utilization of agricultural resources (i.e., building resilience), such as protecting and improving quality of farmlands, and improving the efficiency of agricultural irrigation water use (e.g., rehabilitating irrigation systems and supporting drip irrigation); (ii) preventing and controlling agricultural NPS water pollution, such as reducing chemical fertilizer use; while increasing efficiency of chemical fertilizer use (e.g., through fertigation, deep placing, timing), low residue pesticide use, soil testing and use of formula and organic fertilizer, recycling of livestock and poultry manure and crop straws/residues, and collection and recycling of agricultural plastics—all aimed at reducing GHG emission and sequestering carbon; (iii) building green and low-carbon agricultural industry chains, such as green, organic and geographical indication (GI) agricultural products, and circular economy (e.g., recycling of treated wastewater and manure from livestock and poultry farms); (iv) providing infrastructure needed for the development of green agricultural value chains (e.g., constructing/rehabilitating climate resilient production/access roads, rehabilitation of irrigation and drainage systems, construction/rehabilitation of cold storage facilities to reduce food loss and waste (FLW)); (v) nurturing green skills and talents in rural areas (e.g., training and capacity building of FCs, FAs, WUAs, input stockists, and agro-entrepreneurs); and (vi) enforcing green agricultural development regulations and standards (e.g., toxic pesticide use, effluent discharge standards and burning of straws). These activities will be mainly implemented by farmers, FAs, FCs, WUAs and agro-enterprises, with subsidies from the provincial and country governments.



34. **RA3 - Increasing access to rural solid waste and wastewater services.** The RA3 aims to improve the living conditions in the rural areas, reduce point and NPS pollution and contribute to the reduction in GHG emissions. RA3 will also promote rural circular economy (e.g., efficient use of treated wastewater, such as reuse for irrigation and compost material as a substitute for the chemical fertilizer use, as well as using nature-based solutions to reduce pollution, including constructed retention ponds and wetlands to filter pollutants. RA3 activities include: (i) preparing spatial Integrated Village Development Plans (IVDP), which will guide future rural investments; (ii) improving rural habitat environment, such as constructing or rehabilitating climate resilient rural solid waste (garbage) transfer systems and rural wastewater (sewerage) treatment facilities; improving rural domestic waste collection and disposal systems, including sorting/separation and resource utilization (recycling) of solid waste, and improving sanitation—the “toilet revolution”; and (iii) providing training and capacity building in the O&M of wastewater and solid waste facilities. These activities will be implemented by the relevant provincial and county government departments.

C. Proposed Program Development Objective(s)

35. **The Program Development Objective (PDO) is to enhance environmentally sustainable agricultural and rural infrastructure development in selected areas of Guangxi and Guizhou.** The Program is expected to contribute to the achievement of the Government’s RRS plan phase 1 targets, through: (a) strengthening the institutional capacity to govern the rural development activities; (b) reducing point and NPS agricultural pollution (e.g., COD, NH_3N and TP) and greenhouse gas (GHG) emissions (e.g., CO_2 , CH_4 and N_2O); (c) improving efficiency of natural resource use (especially land and water); (d) building resilience to climate change and improving food safety (e.g., adoption of climate-smart agriculture practices and agro-products certification); (e) improving access to rural infrastructure and public services (e.g., solid waste and wastewater management facilities; and value chains development infrastructure, such as production/access roads, and improved irrigation and drainage systems); and (f) strengthening rural institutions (e.g., training and capacity building and subsidies/matching grants provided to FCs, FAs, WUAs, agricultural input suppliers, and agro-entrepreneurs).

36. **The following are the proposed PDO level indicators:**

- (i) Nutrient loads reduction (Ammonia-Nitrogen (NH_3N), Total Phosphorus (TP)) achieved under the PforR in program counties;
- (ii) Chemical Oxygen Demand (COD) pollution load reduction achieved under the PforR in program counties;
- (iii) Greenhouse gas (GHG) emissions reduction achieved under the PforR in program counties; and
- (iv) Beneficiaries reached with assets or public services (disaggregated by gender and ethnic minority) under the PforR in program counties.

37. **The PforR’s contribution to the GPGs from GHG emission reductions will be indirectly calculated during program implementation.** This will be done at the mid-term and end of program (compared with the 2020 baseline values) by using M&E data on quantities of nutrient loads reduction and pollutant load reduction achieved under PDO/Outcome indicators (i) and (ii) above to calculate the tons of CO_2 equivalent reduced from mitigation measures. This approach would give the third-party verification agencies sufficient time to verify the results using the agreed protocols. Additional GHG reductions will be derived from adaptation measures, such as reduction of FLW, adoption of climate-smart agricultural practices (e.g., technologies that increase water use efficiency—drip irrigation and fertigation), returning crop straws/residues to soil, using green manure and practicing crop rotation. The PforR will ensure that incentives are realigned to attract both public and private investment to reduce pollution loads (non-point source pollution) emanating from the livestock and poultry manure, as well as domestic wastewater entering the waterways. These activities will generate local environmental benefits.



D. Environmental and Social Effects

38. **The government's Program investments to be supported by the PforR are not expected to induce any long term or irreversible adverse environmental and social (E&S) impacts.** The PforR outcomes are intended to reduce pollution to air, water, and land; increase efficiency of natural resource (especially land and water) utilization; and protect the environment and restore degraded landscapes and ecosystems in the selected provinces. The PforR is therefore regarded to have net positive E&S impacts. Any potential activities with significant adverse E&S impacts that are sensitive, diverse or unprecedented on the environment and/or affected people were excluded in the PforR preparation. Within the PforR boundary, activities with potentially adverse E&S impacts are expected to be limited in scope and be site specific with proper mitigation measures to be designed and implemented.

39. **An Environmental and Social System Assessment (ESSA) has been conducted to provide a comprehensive review of E&S legal framework and procedures in China, also in Guangxi and Guizhou Provinces.** The review recommended actions to address gaps and opportunities to enhance performance during PforR implementation, covering all PforR-supporting interventions in the two provinces.

40. **The ESSA was conducted applying the following methodology:** (a) thorough screening of the potential impacts from the activities to be supported by the PforR; (b) desktop review on E&S laws and regulations and procedures related to managing the relevant Program activities at the national, provincial, and local levels; and (c) field visits to sites of typical Program activities in selected counties, with extensive meetings and interviews with key stakeholders ranging from implementing agencies to government officials at provincial, county, township, and village levels and representatives of local communities. Observation and discussions during these visits provided a good understanding of the potential E&S impacts associated with the PforR activities and procedures and capacity of government departments for dealing with such impacts, including measures adopted under relevant laws and regulations.

41. **The E&S risks/impacts associated with the PforR are deemed to be Substantial considering the diverse activities supported under the PforR.** The E&S screening was conducted on the proposed PforR activities to exclude those with high potential to cause significant adverse impacts on the environment and/or affected people, including: (i) construction of new livestock/poultry farms; (ii) relocation or shutdown of livestock/poultry farms; (iii) treatment of domestic solid waste (such as incineration and landfill); (iv) construction, extension or upgrading of township or urban wastewater treatment facilities; (v) use of straw or manure in biogas power generation; (vi) construction of new irrigation systems; (vii) construction or upgrading of rural roads for public transport; (viii) activities that may overlap with ecological resettlement; and (ix) any other activities that have high environmental impacts.

42. **With the application of these exclusion criteria, the PforR will focus on supporting small-scale physical investments,** including rural wastewater collection and treatment facilities; rural domestic solid waste collection, sorting and transfer systems; livestock and poultry manure collection, treatment and utilization; collection of agricultural plastic mulch film and fertilizer and pesticide packaging materials; straws collection and recycling/returning to soil; construction of production/access roads of farmland, improvement of existing irrigation and drainage systems, and cold storage facilities, among others. Thus, the potential negative E&S impacts associated with the PforR activities include: (i) temporary small scale construction-related and site-specific risks/impacts, such as dust, wastewater, noise, solid waste, soil erosion, limited land acquisition or utilization and occupational health and safety (OHS) issues; and (ii) impacts on local environment and ecosystem resulting from the operation/implementation of PforR-supported facilities/activities, such as treated effluent and solid waste from rural wastewater treatment facilities, odor emission from solid waste and manure



management facilities, waste plastics, potential non-point source pollution by fertilizers and pesticide, labor management issues, workers' health and safety, and impacts on farmers' livelihoods, among others. These adverse E&S impacts are neither significant nor irreversible and can be well identified and readily avoided, minimized, and mitigated through known and demonstrated technologies and good management practices. The downstream E&S risks/impacts of proposed TA activities are anticipated to be positive in the long term.

43. **OP 7.50 - International Waterways is triggered because the GARR PforR activities will involve the use or potential pollution of the Pearl River basin, which is shared between China and Vietnam, the latter being upstream country.** Specifically, the GARR PforR activities include the rehabilitation of existing small-scale irrigation and drainage systems and construction or rehabilitation of village wastewater treatment facilities (WWTFs). The irrigation and drainage activities involve the use of water from the tributaries of the Pearl River, which is considered an international waterway as defined in paragraph 1 of the Policy. The WWTFs are not relevant to the application of OP 7.50, as they will improve the water quality of the River and do not pose any risk of pollution. The small-scale irrigation and drainage activities will be implemented in 12 counties in Guangxi and 15 counties in Guizhou. Among the 12 counties in Guangxi, Tiandeng county in Congzuo City has one third of its territory located in the Zuo River catchment area, which China shares with Vietnam. The remaining two thirds of Tiandeng county's territory fall under the You River catchment area that flows exclusively in China.

44. According to the Pearl River Water Conservancy Commission, the Pearl River basin covers approximately 453,700 km². The average annual total water resources available in the Pearl River basin is 338.48 billion m³ (<http://www.osgeo.cn/post/f8bce>). The total area of Tiandeng county located in Congzuo City is 2,159 km² (equivalent to 0.48 percent of the total basin area). In Tiandeng county the Program will support the rehabilitation of small-scale irrigation and drainage schemes with a command area of 5,200 ha. According to the Tiandeng Water Resource Bureau, the water rights (abstraction permits) for these schemes amount to 40 million m³ annually. This is equivalent to an average annual abstraction of 0.012 percent of the total water resources available in the basin. Given the poor conditions of most of the existing schemes the current average abstraction rate is significantly below the threshold of 40 million m³ per annum. By supporting the rehabilitation of the existing small-scale irrigation and drainage systems the Program will also help to increase water use efficiency. In addition to the increase in irrigation water use efficiency there will be no increase in water abstraction beyond the current permitted rate of 40 million m³.

45. It is the Bank team's assessment that the rehabilitation of the existing small-scale irrigation and drainage systems: (i) will not affect the water quality or flow in the upstream riparian country; and (ii) will not be adversely affected by the other riparian's possible water use. As confirmed above, given the nature and scale of the investments, they will not cause appreciable harm to other states. The Program activities within the remaining 11 counties in Guangxi fall within the riparian notification exception under paragraph 7(c) of OP 7.50. The riparian notification exception was approved by the Regional Vice President, as required under OP 7.50 on February 22, 2022.

46. **The ESSA concludes that China has established a comprehensive system for the management of E&S issues at national, provincial, and local levels, including in Guangxi and Guizhou Provinces.** The system consists of laws, regulations, guidelines, specifications, and standards, management procedures and mechanism, and institutional organization and capacity, which is principally consistent with the World Bank's PforR Policy and Directive. This system provides an acceptable basis for addressing the possible E&S issues related to activities supported under the Program.

47. **The ESSA recommends that the PforR be used as an opportunity to enhance the E&S management capacity and the implementation of green agricultural and rural revitalization plans across sectors and among various stakeholders,**



particularly at the county level. This could be achieved by (a) improving pollution control at solid waste transfer facilities, and enhancing workers' PPE and sanitary and refreshment facilities; (b) providing supportive O&M funds to rural wastewater treatment facilities and training to O&M personnel to strengthen their O&M capacity and raise their OHS awareness; (c) providing training to farmers on managing chemical fertilizer, pesticide, plastic mulch film, fertilizer and pesticide packaging materials, and other agricultural waste; and (d) enhancing the social impact/risk management for the construction of small and rural facilities through strengthening the existing project assessment and management systems. To implement these recommendations, following actions have been included in the PAP: (a) the PIUs should design and implement pollution control and OHS management plans for solid waste transfer facilities; (b) the PIUs should provide more funds and training to improve O&M of rural wastewater treatment facilities; (c) the PIUs should provide more training to farmers on improving green agricultural practices and waste management; and (d) the PIUs shall assess and manage the social impacts/risks of those small size and number of rural facilities through the dedicated section in the feasibility studies or special social risk/impact assessment, including establishment of risk management plan and monitoring plan; for those big and/or large numbers of rural facilities, the PIUs can manage the social risks by dedicated social risk/impact assessment, including establishment of risk management plan such as risk identification, management, monitoring and documentation of related public participation, GRM operation.

48. **Consultation and information disclosure. Relevant stakeholders, including both government agencies at provincial, county, township level and local communities, were consulted through meetings, field visits, and online interviews.**.. The draft ESSA report has been shared with the Guangxi and Guizhou PPMOs, relevant provincial government departments, and all PforR counties in January 2022. Virtual consultation meetings were carried out with the key stakeholders at the provincial and county levels, respectively on 18 January 2022 for Guizhou and 20 January 2022 for Guangxi. The participants voiced their support in implementing the proposed PforR and concurred with the findings and recommendations of the draft ESSA, which were considered relevant and valuable for strengthening the actual effectiveness of the implementation of the existing E&S management system. Some participants provided valuable opinions to improve the accuracy of the ESSA description in local context, which have been reflected in the revised ESSA. The updated ESSA was disclosed on the World Bank's website on February 9, 2022, and on the Guangxi and Guizhou regional/provincial websites on February 8, 2022.

49. **Communities and individuals who believe that they are adversely affected because of a Bank supported PforR operation, as defined by the applicable policy and procedures,** may submit complaints to the existing program grievance redress mechanism or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address pertinent concerns. Affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank Inspection Panel, please visit <http://www.inspectionpanel.org>.



E. Financing

50. The total program financing is US\$5,016 million, of which Guangxi will finance US\$2,846 million and Guizhou US\$1,850million, while the Bank will provide an IBRD loan of US\$320 million (See Table 1). The PforR will ensure that allocation of IBRD loan to the various DLIs provides incentives to attract both public and private investment to reduce nutrient and pollutant loads (non-point source pollution) emanating chemical fertilizer use, livestock and poultry manure, as well as domestic wastewater entering the waterways. These activities will generate both global (e.g., GHG emissions reduction) and local environmental (e.g., improved water quality) benefits.

Table 1: Summary of PforR Program Financing Plan

Source	Guangxi PforR		Guizhou PforR		Total PforR	
	Amount (US\$ Million)	% of Total Financing	Amount (US\$ Million)	% of Total Financing	Amount (US\$ Million)	% of Total Financing
Government	2,846	95.0	1,850	91.6	4,696	93.6
IBRD	150	5.0	170	8.4	320	6.4
Total Program Financing	2,996	59.7	2,020	40.3	5,016	100

Note: Covers only 27 counties for Guangxi and Guizhou.

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