

These complement wide-ranging sectoral reforms aimed at addressing persistent pollution challenges.

The waste management sector is under transition as part of efforts toward a circular economy.

Significant public and private infrastructure investments have resulted in improved water quality in the Yangtze River Basin; however, further improvements will require institutional measures.

<sup>4</sup> Changjiang Water Resources Commission (CWRC) Draft Program Proposal (November, 2021).

These include 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.

The law came into effect in March 2021 and is the first legislation for a specific river basin in China

The law calls for local governments to establish water quality baselines, prepare total phosphorus pollution control plans, reduce pollutant discharge through investments in wastewater treatment facilities and piped networks, and control agricultural NPS pollution, including through the promotion of organic fertilizers and control of agricultural plastic film.

The Yangtze River Protection Law represents the latest in a series of national-level reforms aimed at improving the management of natural resources and the coordination of water resources development. Earlier reforms include an amendment to the National Water Law in 2016 to support integrated planning and coordinated basin development. Water-related responsibilities were reorganized within the administrative government system in 2018, with water pollution control responsibilities transferred to the Ministry of Ecology and Environment (MEE), a new Ministry of Natural Resources (MNR) established, and responsibilities within the Ministry of Water Resources (MWR) consolidated.

The system evolved from efforts to solve water pollution issues in Lake Tai in 2007<sup>44</sup> and was implemented nationally in 2016. It raises the priority of water-related issues and has proven useful in addressing challenges of coordination and cooperation between responsible departments and regions.<sup>45</sup> Implementation of the RCS is supported through various mechanisms including River Chief Offices (RCOs), that usually sit within water agencies at the respective levels.<sup>46</sup> China now has over 1.2 million river chiefs with more than 460,000 in the Yangtze River Basin, providing opportunities to address information asymmetries, promote integrated basin management, and increase public participation in the decision-making process.<sup>47</sup>

<sup>44</sup> The Yangtze River Protection Law of the People's Republic of China (March 2021) ([link](#)).

(link)

<sup>45</sup> The River and Lake Chief System is intended to strengthen enforcement and accountability regarding water use control, water quality protection, and restoration of degraded waterways.

While these institutional reforms provide the foundation for integrated river basin management, the transition is challenged by overlapping institutional and jurisdictional mandates, among other factors. The YREB Development Plan and Yangtze River Protection Law are relatively high-level instruments, and their measures require new regulations and operating procedures at multiple levels of government. More broadly, while the institutional reforms of 2018 signaled an important shift toward environmentally oriented water policies and clarified responsibilities, they also created challenges such as the division of responsibilities in basin-level organizations between water quantity management (under the MWR), water quality management (under MEE), and ecosystem services (under MNR).

Operating efficiency in some water-related infrastructure is low, and the knowledge base for integrated river basin management (for example, eco-hydrology and related pollution flows) requires further development. Key water-related data are still segregated across various platforms and agencies, and the availability of data and consistency over time and between different sources remain a challenge.<sup>13</sup> Data sharing within and between the RCS and the traditional basin management authorities is limited, and data collection protocols are not fully standardized.<sup>14</sup> Addressing these challenges requires an appropriate institutional framework, such as that envisaged by the National Yangtze River Basin Coordination Mechanism, the continued resolve of political leaders, and mechanisms that can facilitate inter-jurisdictional cooperation and cross-sectoral coordination.

Specifically, the program focuses on institutions and systems for integrated basin management that can make a significant contribution to global public goods through pollution reduction and biodiversity protection (Box 1). It thus contributes to Engagement Area 2 of the CPF, "promoting greener growth," by reducing water and marine plastic pollution and strengthening sustainable management of natural resources. Moreover, lessons and knowledge generated by the Program are expected to be relevant for addressing integrated natural resource management issues elsewhere and may be scaled up (including with non-World Bank Group resources) in other basins in China and internationally.

Support for improved phosphorus source identification, measurement, and mitigation under the Program is expected to benefit ecosystems locally while providing lessons for improved phosphorus management in large watersheds globally.

The PforR instrument leverages significant resources under existing Government programs, providing for impact beyond traditional Investment Project Financing (IPF).

<sup>6</sup> Global Partnership on Nutrient Management.

Since 1981, the World Bank has financed more than 170 projects with over US\$26 billion in commitments in China. The majority of these have been in transport (31 percent of financing), water (24 percent) and energy (16 percent) (Figure 1).

Early support in the water sector focused on infrastructure and rural development.

In more recent years, project focus has evolved toward more complex issues around integrated water resource management, ecological protection, and natural resources institutions. The YRPRI will build on China's now considerable capacity for infrastructure development by focusing on contemporary challenges of inter-jurisdictional cooperation and cross-sectoral coordination. It supports a nested hierarchy of activities that link financing with performance-based targets at the basin, provincial, and local levels, to address challenges of ecological protection and water pollution. World Bank support aims to unblock institutional processes that are limited not by technical capacity but by constraints and incentives that undermine collaboration and data sharing across and between levels of government.

The YREB Development Plan aims to prioritize ecological protection, river basin coordination, and integrated development across the YREB.

The Yangtze River Protection Law (see para.)

Two provinces, Jiangxi and Hunan, have been selected for support under the World Bank-financed Program (discussed further in Section C below).

Implementation is supported by the Jiangxi River Basin Eco-Compensation Mechanism, which pools<sup>6</sup> a range of financing sources including earmarked funds from national, provincial, municipal, and county governments, as well as private sector contributions.

The objective of the plan is to ensure the safety of water supply and to significantly improve water and environmental quality. It outlines the basic principles, guidelines, and implementation arrangements for governance

<sup>6</sup> Eight priorities are outlined in the Action Plan: (a) establishing an ecological and environmental control system and strictly implementing the ecological redlines; (b) investigating and managing sewerage outlets and promoting integrated land-water monitoring and management systems; (c) strengthening the control of industrial pollution and reducing environmental risks; (d) improving environment conditions in rural areas including control of agricultural non-point source pollution; (e) addressing gaps in environment-related infrastructure, and ensuring the security of drinking water sources; (f) strengthening pollution control from inland waterways transport, and preventing environmental risks at harbors and ports; (g) optimizing the allocation of water resources and ensuring ecological flow requirements; and (h) enhancing ecosystem protection.

Action Plan for the Uphill Battle for the Conservation and Restoration of the Yangtze River ([link](#)).

<sup>6</sup> The Jiangxi River Basin Eco-Compensation Mechanism is not a single provincial budget line and instead comprises a related set of budget lines (coherently monitored and implemented) that form a program.

Integrated Water and Environment Management Plan for Dongting Lake Basin ([link](#)).

To support the Dongting Lake

Basin Plan, the implementation plan<sup>7</sup> includes specific targets, including that by 2025: (a) 95 percent of rivers and waterbodies will reach water quality of Grade III, and the level of total phosphorous will be reduced by 10 percent relative to 2018; (b) the utilization rate of animal manure will remain at least 75 percent, and fertilizer consumption will remain at zero growth relative to 2020; (c) the coverage rate of rural wastewater treatment facilities will reach 90 percent, and the coverage rate of rural solid waste collection and treatment will reach 100 percent; and, (d) the area of wetland restoration will reach 1 million mu (66,000 ha). As in the Jiangxi program, the Hunan program pools a range of financing sources including earmarked funds from national, provincial, municipal, and county governments, as well as private sector contributions.

The core challenges that the Program addresses include insufficient

coordination of ecological and water management actions across jurisdictions and sectors; a need for provincial-level guidelines, regulations, and policies to operationalize the new Yangtze River Law; inefficient wastewater treatment; deficiencies in the management of NPS pollution, including farm manure and agricultural plastic films; and a need for greater technical understanding (and data sharing) on key issues of pollution and ecological management, particularly under expected climate shifts within the Basin (see para. ■ The Program will support interventions that address these challenges on four levels: (a) basin-level coordination, technical guidance, and capacity building; (b) provincial-level development of policies, regulations, and guidelines; (c) sub-basin-level ecological protection and integrated water management; and, (d) county-level activities to reduce plastics and nutrient pollution.

Activities supported by PforR financing

contribute to ecological protection and water pollution reduction goals contained in the provincial plans (see paras.

## Results

Area 2 supports ecological protection and climate resilience in the Yuan River sub-basin, the second largest river in Hunan Province with a length of 1,033 km and a catchment area of 89,163 km<sup>2</sup>, covering 24 percent of the province. Results Area 3 supports activities to reduce water pollution and transmission of plastic waste in the demonstration districts and counties of Miluo county-level city of Yueyang municipality, Ziyang district of Yiyang municipality, Shimen county of Changde municipality, and Yuanling county of Huaihua municipality.

Hunan and Jiangxi face important pollution challenges, including NPS from extensive agricultural development, and are home to critical natural resource assets including the unique ecologies of Poyang and Dongting lakes and their associated tributaries (which are major tributaries for the basin), as well as sub-national provincial YREB programs ready for support and scaling.

In addition to the PforR financing of provincial-level activities, the Program includes a Central Basin IPF to support basin-level activities aligned with the national program for the YREB (with the central government as the borrower for the IPF).

The supported activities will promote cross-sectoral coordination and inter-jurisdictional cooperation toward improving water quality, ecological protection, and climate resilience in the Yangtze River Basin, through enhanced coordination mechanisms, research and policy options for water pollution reduction, ecological guidelines and standards, improved data compilation and management, and capacity building. NDRC, through the Program Steering Committee, will provide strategic guidance for the implementation of the Central Basin IPF, with a Central Project Management Office (CPMO) hosted by the Changjiang Water Resources Commission (CWRC), the basin management authority for the Yangtze River under the MWR, being responsible for day-to-day implementation.

The design for such a mechanism was completed by the CWRC with World Bank support in 2021.<sup>7</sup> This mechanism will be complemented by a basin RCS platform to promote inter-jurisdictional sharing of river management and climate-related information.<sup>7</sup> This includes technical protocols and capacity building for data collection and use of the platform, which will also be connected with provincial platforms supported under the PforR.

This comprises research inputs for policies and guidelines for freshwater ecosystem restoration and protection. Research will support river health guidelines to inform evaluation of riverine ecology, guidelines for determining appropriate ecological flows, and mechanisms for protection and restoration of the aquatic ecosystems of Poyang Lake, Dongting Lake, and important tributaries (namely the Jialing, Wujiang and Chishui Rivers).

This comprises research inputs for policies and guidelines for persistent pollutants, focused on phosphorus. This includes identification of major phosphorus sources, transportation of phosphorus in the Yangtze River system, and the impact of climate change

<sup>7</sup> Working rules for this mechanism were drafted in 2021 with World Bank financing under the China Economic Transformation and Institutional Capacity Building Project (P144270).

<sup>7</sup> Platforms include data on administration and management, ecology and hydrology, including data that are important for climate-informed management decisions, policies and strategies.

This comprises research for the development of innovative incentive mechanisms for ecosystem protection, including on the economic value of ecosystem services in the Yangtze River Basin, methods for integrating ecological data into statistical accounts, definition and clarification of natural resources property rights, and the design of incentive mechanisms for ecosystem and water quality protection (such as eco-compensation, water markets, and pollution discharge fees).

Activities to support technical capacity, including training and knowledge exchanges (including international exchanges focused on Basin coordination mechanisms), support for the operation of the Program Steering Committee, and program implementation support (including consolidated Program reporting).

Development of a Yangtze River Basin phosphorous assessment and climate resilience strategy, which will propose strategies to mitigate such phosphorus-related harms, is a climate indicator in the results framework.

**Activities under Results Area 1 include**

- (a) Strengthening of RCS coordination through the integration of county and municipal, provincial, and basin-level RCS information platforms;
- (b) Development of provincial-level policies, regulations and guidelines on integrated water environment, ecological protection, and plastic waste management; and
- (c) Public engagement in water management, through pollution awareness campaigns, participatory management and river cleanup activities, and development and dissemination of public engagement manuals for the RCS.

Activities supported by Results Area 1 will be implemented by the Provincial Development and Reform Commission (PDRC) as the coordinating counterpart, with the Provincial Department of Finance (PDF), Department of Water Resources (DWR), Department of Ecology and Environment (DEE), and Department of Agricultural and Rural Affairs (DARA) in each province. The supported activities are expected to provide institutional coordination and the policy foundation for environmental and water management outcomes and increased ecological resilience via healthier river and lake ecosystems, across the two provinces.

**Activities under**

**Results Area 2 include**

- (a) Strengthening of integrated water environment management systems, including water environment management plans;
- (b) Development of river health assessment and ecological flow guidelines based on national standards;
- (c) Implementation of water allocation schemes based on national standards; and
- (d) Determination of ecological flow requirements and incorporation into county water allocations to ensure long-term restoration and protection of the ecosystem services.

(2) The river chief data platforms that will be connected under results area 1 contain extensive climate-relevant data (see footnote 73); integrating these data will assist water resource managers in understanding trends, responding with climate-sensitive management actions, and devising climate-sensitive strategies and plans.

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 systems, improving the management and utilization of livestock/poultry manure, and collecting and recycling agricultural plastic waste, in line with provincial policies in the demonstration counties. Activities under Results Area 3 include:

- (a) Improved integrated wastewater management services and collection systems at township level;
- (b) Prevention of plastics entering waterbodies through collection and recycling of agricultural plastic film; and
- (c) Reduced nutrient runoff via improved management and utilization of livestock/poultry manure.

The Central Basin IPF supports the operationalization of the RCS

collaboration mechanism at the Basin level, with Results Area 1 supporting the connection of provincial-level RCS data platforms to the basin-level RCS platform to be established by the CWRC. The Central Basin IPF also supports research aimed at informing and harmonizing provincial-level guidelines, regulations, and policies while providing capacity building and knowledge exchange activities that will support their implementation. The Central Basin IPF focuses its ecological research activities and resulting management recommendations on Poyang Lake and Dongting Lake Basins (key biodiversity hotspots and target areas under Results Area 2).

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. The IBRD loan will comprise US\$392.5 million equivalent as part of the PforR in support to the two sub-national provincial programs, with US\$196.25 million for each province, and US\$7.5 million equivalent for the Central Basin IPF.

(2) The Gan River Water Environment Information Platform will collect climate-related data to support management to mitigate the impacts of climate extremes on target riverine ecosystems. (3) Integrated water environment plans for the sub-basins will include specific chapters on climate change impacts and potential management responses. These plans will incorporate climate considerations (for example, flood risks) in their infrastructure investment recommendations.

<sup>7</sup> Net emissions reductions from Program-supported activities within the demonstration counties (DLI.3) include mitigation (net) of 25,705 tons CO<sub>2</sub>-e annually from improved wastewater treatment; and 13,244 tons CO<sub>2</sub>-e annually from utilization of livestock/poultry manure, for total net emissions reductions of 38,949 tons CO<sub>2</sub>-e annually and 584,239 tons CC<sub>4</sub>-e over 15 years.

The pollution reduction

targets refer to three annual targets: (a) reductions in chemical oxygen demand (COD)<sup>8</sup> (quality difference between inflow and outflow) at township wastewater treatment plants, (b) the weight (tons) of agricultural plastic film collected; and (c) livestock/poultry manure utilization rates (that is, treatment and use of manure for biogas and organic fertilizer) and two one-off targets: (a) establishment of integrated wastewater service systems agreements and (b) establishment of wastewater management strategies.

<sup>8</sup> Not more than CNY 48 million as approved by the central government, with the actual amount during implementation to be based on an agreed annual workplan submitted by the CWRC to the World Bank.

COD is often used as a measure of WWTP efficiency.

The World Bank will review and provide feedback on the terms of reference

(TOR) for the verification agent, with the final agreement subject to confirmation of acceptability by the World Bank.

It

supports establishing and maintaining the connection of county and municipality river chief information platforms to the provincial information platform and connection of the provincial platforms to the basin platform.

**DLI 2: Improved water environment management system in the demonstration sub-basins.** DLI 2 is a composite index with a series of discrete actions with recurrent compliance monitoring, including (a) approval of water environment protection plans covering the demonstration sub-basins (Gan River in Jiangxi and Yuan River in Hunan); (b) establishment of a water environment information platform (Jiangxi) or issuing technical guidelines on data connection for the RCS information platform (Hunan); and (c) implementation of ecological flows (meeting defined flow targets) on the mainstream and major tributaries, in each of the two demonstration sub-basins.

This information, plus the status of the information platform (in Jiangxi supporting data sharing and decision-making) and public disclosure of the Technical Guideline on data connection for the RCS information platform (in Hunan), will be collected by the DEE and the RCO in the two provinces, respectively, and verified through the verification agency.

**DLI 3: Reduced pollutant loads entering waterways in demonstration counties.**

**Verification:** Confirmation of integrated wastewater systems is based on (a) county-level integrated wastewater management strategies are publicly disclosed at county government websites; (b) valid contracts of integrated county wastewater collection and treatment; (c) verification of COD concentrations according to environment bureau real-time monitoring data records.

**Verification:** Data on agricultural plastic film collection will be obtained from the inventories established at county-level collection sites (including agro-input sale networks, solid waste sorting centers, and recycling centers among others) and verified by the verification agencies based on random sampling.

Unutilized and improperly managed manure is a source of NPS water pollution and GHG emissions.

RCS data platform connections (DLI 1), as well as the Gan River Environment

Information Platform (DLI 2) will support the sharing of climate-relevant hydrological and ecological data necessary for coordinated climate-sensitive management actions, strategies, and plans; integrated water and environmental management plan for the Yan River (DLI 2) will include climate impacts and management responses and incorporate climate considerations (for example, flood risks) in infrastructure investment planning; ecological flows (DLI 2) are expected to increase resilience to temperature extremes and drought, as well as mitigate low-flow related methane emissions and build up carbon stocks; Integrated Wastewater Management Strategies will include options for treatment plant resilience measures (for example, for site selection in the context of flood-related risks) and low-carbon technologies (for example, installation of energy management systems) (DLI 3.1), while county-level investments will deliver substantial GHG mitigation through improved wastewater service systems and utilization of manure waste to replace chemical fertilizer use (see footnotes 77 and 78 and para.

A Program Steering Committee (PSC) will be led by the Office of the Leading Group for the Development of the

Yangtze River Economic Belt under NDRC (YREB Coordination Office).

The Central Program Management Office (CPMO) will be hosted by the Changjiang (Yangtze) Water Resources

Commission (CWRC). The CWRC is a river basin authority under the MWR, with a mandate to undertake integrated water resources management (including water conservation and allocation), basin planning, water infrastructure construction, and scientific and policy research. The CPMO will be responsible for co-chairing, reporting, managing, and monitoring the implementation of environmental and social E&S activities under the MWR activities, and the Central Bank integrated water

capacity building, support to the PSC, along with Program implementation support, including consolidated reporting. The CWRC will host the CPMO given its alignment between its mandate and the Program objectives, plus technical capacity, to ensure an integrated river basin approach.

#### Program Steering Committee

Program steering committees will be required to establish a Management Office, headed by a qualified officer and supported by adequate staff. It will manage all activities until completion.

The engagement of public institutes

is encouraged, established practice in World Bank financed projects in China, including in the GEF Mainstreaming Integrated Water and Environment Management Project (P145897), Economic Transformation and Institutional Capacity Building Project (P144270), Building a Modern Fiscal System Technical Assistance Project (P14094), Yunnan Highway Asset Management Project (P132621), and Guangdong Compulsory Education Project (P154621).

An M&E plan will be prepared, specifying the unit of measurement, baseline value, targets, and data sources for each indicator, along with the methodology and responsibility for data collection and reporting. Existing government systems based on the relevant technical guidelines applied by authorities at all levels will be used for results measurement; these systems have proven effective at documenting the achievements and impacts of a wide range of ecological protection and water pollution control measures under other (World Bank and non-World Bank) projects.

Reporting on the Program will be consolidated by the CPMO based on reports from the PPMOs and the relevant implementation agencies responsible for the basin activities and submitted to the World Bank for review.

The PDFs are responsible for monitoring the management and disbursement of funds. The respective DWRs are responsible for monitoring ecological flow compliance and providing data on water resource management, DEEs are responsible for monitoring water quality, DHURDs are responsible for monitoring wastewater services, and DARAs responsible for agricultural plastic film and NPS pollution.

Both Jiangxi and Hunan Provinces have indicated that they would like to apply for a 25 percent advance payment (US\$49.0625 million for Jiangxi Province and EUR 42.125 million for Hunan Province) under the PforR.

The cumulative disbursement in the first two years after Board approval is not reasonably expected to exceed 60 percent of each IBRD loan based on the amount of the advance, along with the DLIs expected to be achieved in the first two years of implementation, the timing of the annual verification cycles (which will need to be completed before disbursements against achieved DLIs), and the disbursement schedule of the Basin IPF.

If by the end of the Program, the PforR financing amount disbursed exceeds the total amount of Program expenditures, the borrower refunds the difference to the World Bank.

A Designated Account (DA) for the Jiangxi PDF will be set up in US dollars, while a separate DA will be set up for Hunan PDF in euros.

The development of strategic plans for sustainable wastewater services by counties is intended to improve their operational efficiency, with training on chemical fertilizer use and agricultural waste management for farmers aimed at improving water pollution control. The Central Basin IPF will also provide capacity building on technical topics, including indexes for monitoring river health, and the determination, monitoring, and supervision of ecological flows, through workshops and study exchanges.

The participating provinces are experienced with IPF projects but have less experience with results-based financing in the water and environment sector.

Training on the Environmental and Social Framework (ESF) and the related standards applications will be provided to the CPMO for implementation of the Central Basin IPF, as this is the first time the CPMO has used the ESF

Three distinct but complementary sets of activities are included in the design (see section II) that are integral to the Government program: improvement of institutional mechanisms for coordination around ecological protection and water pollution control (Results Area 1); enhanced integrated water environment planning and ecological flows in target sub-basins (Results Area 2); and activities that contribute to reduce pollutants entering waterways (Results Area 3) (Figure 7). These are supported by the Central Basin IPF that will provide: (a) inter-jurisdictional cooperation and data sharing; (b) research-based technical guidance related to key activities, such as guidelines for the evaluation of river health and ecological flows, strategies for total phosphorous pollution prevention and control, and recommendations for the systematic protection and restoration of Poyang Lake and Dongting Lake; and (c) overall coordination and TA.

The RCS promotes water resources protection, shoreline

management, water pollution prevention and control, water environment management, and restoration of water ecology.<sup>7</sup> Under the RCS, each part of a river and lake is assigned to a particular official at the provincial, municipality, county, and township levels, which helps address coordination and assignment-of-responsibility challenges between departments and regions. With more than 1.2 million river and lake chiefs appointed, over 460,000 in the Yangtze River Basin, this innovative system seeks to address the challenges of integrated water resources management (IWRM) and water pollution control through promoting cross-sector coordination and inter-jurisdictional cooperation.

The coordination mechanism revolves around the six main tasks of the river chiefs, with the

aim of promoting coordination among the 19 provincial RCOs and the CWRC, and is expected to facilitate joint planning and coordination in policy implementation for river protection and restoration.

A working conference and

information management platform are to be established under the basin RCS coordination mechanism. The working guidelines for the basin RCS coordination mechanism requires each of the provincial RCOs to strengthen cooperation and coordination through the joint development, co-management, and sharing of information, with the CWRC to lead in establishing a water-related information management system for the Yangtze River Basin. Each of the provincial RCOs is required to establish a provincial-level RCS information management system and provide, maintain, and update information in a timely manner to ensure the completeness, accuracy, timeliness, and availability of information and data to promote the basin-wide information-sharing system and big data center. Data include sectoral planning (water, mining, environment, waterway, and so on), water resources, water quality, water ecology, water emergency, and pollution discharge licenses. The information platforms for the provincial RCOs will be connected to the national-level platform for the inter-ministerial joint committee on the RCS administered by the MWR and to the basin-level information platform to be developed by the CWRC. Counties and municipalities will connect their local river chief information platforms to the provincial platforms as part of Results Area 1.

The Yangtze River Protection Law commits

governments to determine, allocate, and monitor ecological flows for the Yangtze River's mainstream, major tributaries, and important lake sections.<sup>8</sup> The technical assessment indicates that the provinces are working on systems to determine ecological water allocations, yet water allocation formulas are based on relatively simplistic hydrological indexes to determine minimum flow requirements rather than detailed assessments of ecological requirements. The Program will support the development and approval of basin-level guidelines for the determination of river health and ecological flows as part of the Central Basin IPF.

The law also requires that water conservancy,

hydropower, and shipping hub projects on the mainstream and major tributaries of the Yangtze River, and in the upper reaches of important lakes, incorporate ecological water allocations in daily operation and allocation procedures. Where the discharge does not meet the requirements of ecological flow discharge, the water resources departments at or above the county level are required to determine and supervise corrective measures.

It will also support the development and approval of sub-basin or provincial-level instruments to reduce pollution, including solid waste management plans and phosphorus management guidelines.

Activities at demonstration county level include point source pollution control through improvements in access and operations of township domestic wastewater collection and treatment services, along with NPSs of pollution through improved management of plastic waste and increased utilization and management of animal manure. Article 46 of the Yangtze River Protection Law requires provincial governments to formulate a total phosphorus pollution control plan and organize its implementation (supported by Results Area 2). The Central Basin IPF study on key pollutants will focus on a basin-level assessment of total phosphorous as well as establish the thresholds of key pollutants flowing into the Yangtze River, helping the provinces to set emission control targets in the provincial plan. These can help guide provinces in preparing their own total phosphorus control plans, under an overall basin total phosphorus control target.

Article 47 requires county governments to make plans for the construction of centralized sewage treatment facilities and supporting sewer networks, to improve sewage collection and treatment capacities, and also emphasizes the need to clarify responsibilities and implement unified management. The national 14th FYP for wastewater management calls for promotion of integrated wastewater collection and treatment services. Similarly, Article 48 commits to strengthening the prevention and control of agricultural NPS pollution, with the application of chemical fertilizers to be reduced, the use of organic fertilizers to be promoted, and agricultural waste such as plastic films to be disposed appropriately. The dumping, burying, or treatment of solid waste is forbidden within control areas for rivers and lakes in the Yangtze River Basin (Article 49), and the county-level governments are required to strengthen joint prevention and control of illegal transfer and dumping. In addition to direct activities toward these requirements under Results Area 3, the Program contributes through support for the provincial-level plans and guidelines for plastics and agricultural pollution management (Results Area 1).

### The World Bank's experience in strengthening institutions for the management of transboundary river basins

The YRPERP draws on lessons from a range of World Bank-financed programs and analytical work in transboundary river basins.

In response, the YRPERP links financing to performance-based targets that strengthen institutions for inter-jurisdictional cooperation and cross-sectoral coordination. Specific actions are aligned with the functions and responsibilities of existing organizations through a nested hierarchy of activities at the basin, provincial, and local levels, providing a Program framework aligned with the decentralized and polycentric nature of river basin management in China.

Since the adoption of the European Union Water Framework Directive, European Union countries have used a river basin approach for water management, including the 19 countries that share the Danube River Basin. The Program supports the basin countries by informing the policy dialogue and strengthening institutional capacity through partnerships with regional, national, and local stakeholders.

The World Bank has been investing in the countries of the region for more than 20 years under a shared vision to cooperatively and jointly develop shared water resources. Regional norms and processes have been established to share information and conduct joint modelling to inform the prioritization, planning, and implementation of investment projects across the basin.

Building on an earlier World Bank project that financed sewage infrastructure in pollution hotspots along the river, the project is building the capacity of the National Ganga River Basin Authority to establish management tools, investigate environmental flow options, and collect and share data in a complex multi-state governance setting.

The Program provided long-running support for collective management and governance through policy, legal, and institutional reforms. These focused on environmental management in pollution hotspots, mechanisms for cooperative management between the partner states, and environmental restoration of degraded sub-catchments, highlighting the time required to realize results when addressing NPS pollution.

Analytical work in partnership with the Australian Water Partnership has highlighted institutional arrangements for the allocation and measurement of environmental flows (environmental water holders) in inter-jurisdictional contexts. A Basin-wide Environmental Watering Strategy sets out objectives for river health, with water then allocated to improve flows; water holders decide where and when environmental water will be delivered to achieve those environmental objectives.

These activities, set within complex inter-jurisdictional spaces with parallels to the Yangtze River Basin, have influenced YRPERP activities on data sharing and coordination, integrated management planning, capacity building, environmental water allocations, and the use of demonstration investments to influence cross-boundary outcomes. It is also expected that YRPERP experience will similarly contribute to global knowledge on mechanisms for transboundary management in multilevel governance contexts (for example, systems within federated states or under regional management bodies). The Chinese experience in complementing infrastructure-led water sector development with inter-jurisdictional institutions for sustainable water management will be valuable for World Bank clients looking to make a similar transition as their development needs evolve.

Implementation of the national YREB program is funded through a range of instruments at the provincial and local level in accordance with the responsibilities for expenditures on ecological and environmental protection issued in May 2020.

Eco-compensation mechanisms include those specific to river basins, forestry, wetlands, green supply chain and procurement, ecological industries, and green finance and are recognized as some of the financing instruments that will help achieve the goals of the national YREB strategy and its provincial subsidiary plans.

Each county is evaluated against three sets of indicators annually: (a) water quality; (b) forest and ecological conservation; and (c) water resource and water environment integrated management, with funds allocated according to results. An estimated CNY 14 billion (US\$2 billion) has been invested through the RBECP from 2016 to 2020 (averaging around US\$4 million annually), including approximately US\$1.4 billion from the central government through the National Key Ecological Zone Program (NKEZP) supplemented through general provincial budget allocations and county contributions.

However, the use of the RBECP funds can be assessed through the annual self-review reports prepared by the counties.<sup>91</sup> According to the self-review reports, most local governments (65 percent) use the RBECP as earmarked funds, with some local governments (28 percent) blending the RBECP with other financial sources at the county level. These show RBECP expenditures on water pollution reduction (28.5 percent), water ecological management (13.3 percent), waste management (12.9 percent), rural and urban environment improvement (13.3 percent), forest improvement (5.9 percent), and institution improvements (4 percent).

From 2018 to 2020, roughly CNY 14 billion (US\$2.16 billion) was allocated from the central and provincial governments for water environment management in the Dongting Lake Basin.

that the source of funds for the Government program in 2020 is roughly 70% stable and guaranteed w

This indicates

The total

Government financing for the program during the program implementation period (2022 to 2026) is estimated at CNY 23,446 million (US\$3,607 million) based on the average financing for the three years from 2018 to 2020.

The final expenditures related to water environment management in Hunan Province were determined through an analysis of the statement of government final accounts for the past three years. According to the final account data, about CNY 24.34 billion (US\$3,760 million) was used on water environment management from 2018 to 2020.

Those two

expenditures together (approximately CNY 17 billion) exceed the financing amount in the three years (CNY 14.07 billion), indicating sufficient funding sources for the provincial program. Provincial commitments toward implementation of the Government program under the 14th FYP (2021 to 2025) amount to CNY 37.12 billion (US\$5.73 billion), of which CNY 7.41 billion (US\$1.14 billion) is allocated toward investments in water supply protection, CNY 21.99 billion (US\$3.40 billion) invested in water pollution prevention and treatment, and CNY 7.72 billion (US\$1.19 billion) invested in water ecological protection and restoration, providing an adequate basis for this PforR.

The economic values of water quality and ecological improvement are challenging to quantify due to the dispersed spatial extent of benefits across the basin, the wide range (and indirect nature) of benefit types, and data limitations.

<sup>9</sup> *Benefit studies using the contingent valuation method (CVM) do not capture the direct economic values of water quality and ecological improvement that are associated with water quantity. Benefit quantification is incorporated into a benefit-cost analysis (BCA) applied at the sub-basin level for Yangtze and Dongting Lake Basins.*

<sup>9</sup> Contingent valuation method uses questionnaires targeted to affected populations to elicit their willingness to pay (WTP) for non-market environmental goods such as avoidance or reduction of pollution impacts.

#### Economic Rate of Return (ERR) and Net Present Value (NPV) by Basin

|                     | ERR (%) | NPV @ 6% (US\$, millions) |
|---------------------|---------|---------------------------|
| Poyang Lake Basin   | 15.7    | 1,957                     |
| Dongting Lake Basin | 18.3    | 3,684                     |

#### GHG Emissions Mitigation

64.

Upgrades to the wastewater network and treatment operations is expected to reduce emissions due to leakage of wastewater to groundwater.

This assessment does not include the expected emissions reductions through institutional, policy, and planning measures<sup>9</sup>, nor through ecological restoration (due to challenges in quantifying these reductions).

<sup>9</sup> The shadow price of carbon is set at US\$38 per ton (lower bound) and US\$75 per ton (upper bound) in 2017, increasing by 2.25 percent per year, and applied to the quantified emissions reductions (in the form of an NPV) calculated here.

**Financial Management risks.** Major risks identified include the following: (a) inadequate supervision on the usage of Program funds by related provincial entities may bring potential risk of improper use of Program funds given that there is no requirement for provincial governments to report Program expenditures in Hunan Province and the reporting requirement stipulated in Government decrees have not been strictly implemented in Jiangxi Province; (b) the program has no budget classification element and the required Program financial reporting cannot be generated from the Government treasury system; and (c) Government auditors have thus far not audited program funds and have not prepared any program audit reports. Although the proposed Program will be limited to the water and environment-related sectors, a number of activities will be included, which is expected to pose challenges to the auditors when planning Program audits.

Mitigation measures for the major FM risks will include (a) developing a tailored format for Program financial reporting drawing on the experiences of other PforR projects in China, designed and agreed on by the World Bank and the PDFs; (b) the World Bank working with the Provincial Audit Office (PAO) to develop TOR to help coordinate Program audits and (c) outlining a pilot program for tagging Program related expenditures in the Government treasury system in the Program Implementation Plan (PIP), allowing Program financial reports to be generated directly from the treasury system and facilitate the external audit within the demonstration counties.

All open bidding competitive processes are conducted by public resources transaction centers, which provide facilities and modern platforms for processing procurement activities electronically.

Human, financial, and policy resources should be allocated by Hunan and Jiangxi PDRCs for close monitoring contract implementation progress to minimize or avoid foreseeable cost overruns and/or implementation delays.

Fiduciary risk rating.

Fiduciary supervision.

In addition, relevant provisions of the World Bank ESF have been applied to the Central Basin IPF and an Environmental and Social Management Framework (ESMF), a Stakeholder Engagement Framework (SEF), and an Environmental and Social Commitment Plan (ESCP) prepared in accordance with the requirements of the ESF.

The ESSA was conducted according to 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.

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, agricultural plastic film collection and recycling, waste treatment of existing livestock farms, and institutional and capacity building activities.

The ESSA recommends that the PforR be used as an opportunity to strengthen the E&S management capacity of different stakeholders. This could be achieved by (a) providing training on chemical fertilizer use and agricultural waste management to farmers; (b) establishing a sustainable incentive mechanism to increase collection rate, in which the existing jobholders should be appropriately considered, for example, the village cleaners; (c) enhancing the OHS management of the enterprises involved in the Program activities; and (d) establishing a social impacts and risks screening public participation, monitoring, and reporting mechanism.

The downstream E&S impacts could include 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.

The relevant provisions of the World Bank ESF have been applied and the relevant instruments disclosed.

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.

Challenges around cross-sectoral coordination and inter-jurisdictional cooperation motivated the 2018 ministerial reforms (see section I), and the Yangtze River Protection Law recognizes the importance of an integrated approach to river basin management and ecological protection. While the law calls for the establishment of a National Coordination Mechanism, this mechanism has not yet been confirmed and there remains some ambiguity about the roles and responsibilities of the various agencies, with coordination and information flow challenged by existing governance structures.

While the boundaries of the YREB are broad, including a wide range of potential activities implemented through various stakeholders and financing mechanisms, it is the sub-national provincial programs that form the Government program, a sub-set of which is supported by the PforR.

Strengthening the RCS relies on a number of different stakeholders, along with the establishment and integration of management information systems, to inform a number of actions that can deliver on the expected outcomes improvements in inter-jurisdictional cooperation at the basin level.

Despite significant experience in IPF operations, there is limited experience with results-based financing in the water and environment sectors.

Risks arise from the potential implementation of products or outcomes of the TA, including the basin-level studies on water pollution and ecological protection and province-level plans and policies. Such indirect E&S implications could include impacts from construction, rehabilitation, and operation of wastewater and solid waste collection and treatment facilities, labor risks, community health and safety risks, restrictions on land use, resettlement, and exclusion risks for vulnerable groups, among others. Risk mitigation is provided by the ESF instruments prepared for the Central Basin IPF, the ESSA, and measures included in the PAP.

The role of the PDRC as the provincial-level counterpart and the use of results-based financing that incentivizes action across sector agencies help mitigate this risk.















(b) Provincial river chief  
system information  
platform: a Technical  
Guideline for Data  
Connection issued to  
improve the river chief  
system information  
platform in Hunan.



wastewater management  
strategy and integrated  
agreements).











**(3) Wastewater Treatment**

Plant and Network [REDACTED]  
Integration Arrangement [REDACTED]  
means an arrangement, [REDACTED]  
acceptable to the Bank, to [REDACTED]  
be established by each [REDACTED]  
Demonstration County in [REDACTED]  
the form of a contract, an [REDACTED]  
agreement or such other [REDACTED]  
instrument set forth in the [REDACTED]  
Program Implementation [REDACTED]  
Plan, specifying the roles, [REDACTED]  
responsibilities and [REDACTED]  
performance standards for [REDACTED]  
the provision of integrated [REDACTED]  
wastewater services by [REDACTED]  
service provider(s) assigned [REDACTED]  
with the operation and [REDACTED]  
maintenance of the [REDACTED]  
wastewater treatment [REDACTED]  
plants and/or the sewage [REDACTED]  
network. [REDACTED]





















**Demonstration counties meeting annual targets for manure utilization (Jiangxi)**

| Type of DLI          | Scalability | Unit of Measure        | Total Allocated Amount (USD)                             | As % of Total Financing Amount |
|----------------------|-------------|------------------------|--|--------------------------------|
| Intermediate Outcome | Yes         | Number                 | 29,250,000.00  | 7.31                           |
| Period               | Value       | Allocated Amount (USD) | )  | Formula                        |
| Baseline             | 0.00        |                        |  |                                |
| 2022                 | 6.00        | 5,850,000.00           | US\$975,000 per county that achieves their annual target |                                |
| 2023                 | 6.00        | 5,850,000.00           | US\$975,000 per county that achieves their annual target |                                |
| 2024                 | 6.00        | 5,850,000.00           | US\$975,000 per county that achieves their annual target |                                |
| 2025                 | 6.00        | 5,850,000.00           | US\$975,000 per county that achieves their annual target |                                |
| 2026                 | 6.00        | 5,850,000.00           | US\$975,000 per county that achieves their annual target |                                |
| .                    |             |                        |  |                                |

The Bank will disburse US\$547,492, respectively, for the Hunan provincial platform connected to basin one and for the subsequent two years for maintaining its functions; for year 1 and 2, US\$116,468.8 will be disbursed to each new connection made (the maximum target for Year 1 and Year 2 is 68 respectively); for year 3 to 5, the bank will disburse US\$56,277.745 to each county and municipal platforms performing the three functions (maximum 136 platforms each year).

(3) The Ecological Flow Requirements at approved control

sections on the mainstream and major tributaries of the Yuan River have been complied with for at least 90% of the days of the CY (excluding the days of Eligible Emergencies)

(2) Technical Guideline provided by PDWR/PRCO for verification

(3) The compliance rate of the mainstream and key tributaries of Yuan River can be verified through the Government line agency's ecological flow monthly monitoring bulletins for key rivers.

It means an arrangement,

acceptable to the Bank, to be established by each Demonstration County in the form of a contract, an agreement or such other instrument set forth in the Program Implementation Plan, specifying the roles, responsibilities and performance standards for the provision of integrated wastewater services by service provider(s) assigned with the operation and maintenance of the wastewater treatment plants and/or the sewage network.

The cumulative

total target of COD reduction t (24,420 tons) can be achieved during any time year of Program implementation, and the Bank will make disbursement based on the actual achievement in each calendar year.

The cumulative total target of agriculture plastic

film collected (1,819,000 kg) can be achieved during any time year of Program implementation, and the Bank will make disbursement based on the actual achievement in each calendar year.



(3) The compliance rate of the mainstream and key tributaries of Gan River can be verified through the Government's ecological flow monthly monitoring bulletins for key rivers and lakes.



The cumulative total target of agriculture plastic

film collected (1,935,740 kg) can be achieved during any time year of Program implementation, and the Bank will make disbursement based on the actual achievement in each calendar year.

Complex problems exist

in interregional, intergovernmental, and inter-departmental collaboration, which reduces coordination and thus efficiency of water resources and water environment management. The implementation difficulties of IWRM in China may be ascribed to factors such as an amorphous definition, operational difficulties, departmental conflicts, and lack of defined authority for river basin management.<sup>51</sup> Recent institutional reforms in China are facilitating improved coordination and cooperation. For example, the Yangtze River Protection Law, passed in 2020, provides a legal foundation for basin-specific coordination in China and could be eventually transposed to other major river basins. It is the first legislation for a specific river basin in China and infers specific obligations on the national agencies and provinces, delineates responsibilities, and requires systems for information sharing and establishing of forums for knowledge exchange and decision-making between jurisdictions.

The ministerial reform of 2018 and the ministries that resulted are also important steps

forward, with complementary responsibilities for water management brought together.

In addition, significant shares of revenues are transferred from the central government to the provinces

and from provinces to lower-level governments, both as earmarked and general-purpose grants.

According to the Reform Plan for Delineating the Functions

and Expenditure Responsibility between the Central Government and Provinces regarding Ecology and Environment Protection,<sup>91</sup> national-level ecological environment planning, policy and law making, implementation monitoring, management, law enforcement, and capacity building has been classified as a central functionality; prevention and control of water pollution in key basins such as the Yangtze has been classified as shared functionality; and local-level ecological environment planning, policy and law making, implementation monitoring, management, law enforcement, and capacity building, as well as the prevention and control of agricultural and rural pollution, solid waste pollution, chemical pollution, groundwater pollution, and other local air and water pollution, has been classified as local functionality.

An expected US\$6,126 million (93.87 percent) will be funded by the Government and US\$400 million (6.13 percent) will be financed by IBRD loan (see Section II.C). Of the US\$6,126 million government funding, it is estimated that US\$2,519 million will come from Jiangxi Province and US\$3,607 million will come from Hunan Province. The IBRD loan will comprise US\$392.5 million as part of the RBECP, which will support the overall national provincial programs and with US\$1,962.5 million for protection, rehabilitation, and US\$7.5 million for the Central Basin Fund.

#### Jiangxi River Basin Eco-Compensation Program (RBECP)

If

From 2016 to 2020, managed by the Jiangxi

PDF, about CNY 14 billion (US\$2 billion) of Government expenditure was channeled through the RBECP (averaging around US\$6,126 million annually, Table 3.1).

Therefore, the World Bank team estimates the RBECP funds in 2022 to 2026 will reach CNY 16,375 million, or US\$2,915

million (using an exchange rate of 6.5:1).

Among the US\$2 billion channeled through the program between 2016-20, approximately US\$1.4 billion was a general transfer from the central government and the NKEZP, with the rest coming from the provincial general budget and contributions from the counties (Figure 3.1). Funds allocated by the central government accounted for the highest proportion, more than 60 percent since 2017. This suggests that the source of funds for the RBECP in Jiangxi Province is relatively stable and guaranteed.

Based on self-review reports, most local governments (64.95 percent) use the RBECP as earmarked funds, and a small proportion of local governments (27.84 percent) blend the RBECP with other financial sources at the county level. As shown in Figure 3.1 (right), of all the RBECP spending, the expenditures on water pollution reduction accounted for 28.5 percent, water ecological management for 13.3 percent, waste management for 12.9 percent, rural and urban environment improvement for 13.3 percent, forest improvement for 5.9 percent, and institution improvement for 4.0 percent.

#### Hunan: Integrated Water Environment Management Plan for Dongting Lake Basin

9.

The Plan is financed by several sources of budget funding and covers the entire Dongting Lake Basin. From 2018 to 2020, roughly CNY 14 billion (US\$2.16 billion) was allocated from the central and provincial government for water environment management in the Dongting Lake Basin. The

The total program financing during the 14th FYP (2022 to 2025) is estimated at CNY 23,446 million (US\$3,607 million) based on the average financing for the three years from 2018 to 2020.

According to the

final account data, about CNY 17.6 billion (US\$2,708 million) was spent on water environment management from 2018 to 2020.

Those two expenditures together roughly match the financing amount in the three years (CNY 14.07 billion), indicating sufficient funding sources for the Provincial Program. Provincial commitments toward implementation of the Government program under the 14th FYP (2021 to 2025) amount to CNY 37.12 billion (US\$5.74 billion), of which CNY 7.41 billion (US\$1.14 billion) is allocated toward investments in water supply protection, CNY 21.99 billion (US\$3.40 billion) invested in water pollution prevention and treatment, and CNY 7.72 billion (US\$1.19 billion) invested in water ecological protection and restoration, providing an adequate basis for this PforR.

Therefore, the funding allocation rule provides a strong

incentive for the counties to achieve the desirable objectives set by the provincial government and helps ensure value for money.

According to self-reviewed reports from 76 counties in 9 municipalities in Jiangxi Province in 2018, the amount of the RBECE allocated to each county (cities, districts) has a significant negative correlation with its economic development level and with the level of local government financial resources (see Figure 3.2).

The budget funding of the Program activities accounts for only about 1 percent of the general budget revenue in Jiangxi (Table 3.1), so financial sustainability is not a major concern.



Three distinct but complementary sets of activities are included in the PforR design: improvement of institutional mechanisms for coordination around ecological protection and water pollution control (Results Area 1); enhanced integrated water environment planning and ecological flows in target sub-basins (Results Area 2); and activities that contribute to reduced pollutants entering waterways (Results Area 3). These are supported by the Central Basin IPF that will provide (a) overall coordination; (b) technical guidance to provinces to ensure alignment across the basin related to key activities, such as the guidelines for the evaluation of river health and ecological flows, strategies for total phosphorous pollution prevention and control, and recommendations for the systematic protection and restoration of Poyang Lake and Dongting Lake; and (c) inter-jurisdictional information and data sharing.

#### Results Area 1: Improving Institutions and Innovations for Integrated River Basin Management

14. Complex problems exist in interregional, intergovernmental, and inter-departmental collaboration in water resources management, which reduces the coordination of water resources and water environment management. The inefficiency of IWRM and the difficulty of implementing it in China may be ascribed to factors such as amorphous definition, operational difficulty, departmental conflicts, and lack of authority in river basin management.<sup>91</sup> Institutional reforms in China are facilitating improved coordination and cooperation but require further operationalization and deepening to deliver on their potential.

There are six main tasks focused on (a) water resources protection; (b) shoreline management; (c) water pollution prevention and control; (d) water environment management; (e) restoration of water ecology; and (f) law enforcement.

Information management platforms are required under the national guidelines and are being established at various levels of government to support RCS implementation and operation. These range from relatively simple administrative systems to more sophisticated information platforms with decision-support functions supported by physical monitoring networks and public participation.<sup>10</sup> A national pilot-level platform has been developed, and a range of provincial and local level platforms are being implemented on a trial basis.

An information management platform is to be established under the basin RCS coordination mechanism.

Under the provision of the working guidelines, the CWRC is to lead in establishing an information management system for the Yangtze River Basin RCS.

Each of the members of the coordination mechanism is required to provide continuously updated data on sectoral planning (water, mining, environment, waterways), water resources, water quality, water ecology, water-related emergencies, and pollution discharges, among others. Among other uses, these data are important for climate-informed management decisions, policies and strategies including water management and pollution control under flow extremes.

The RCS also provides an opportunity to promote engaging the public in river protection and water pollution control.

<sup>10</sup> These efforts are to be

<sup>10</sup> For sophisticated platforms data include: (a) administrative functions relating to the river chiefs (river patrols, water pollution and illegal natural resources exploitation supervision, reporting and resolution coordination, public participation); (b) water quantity data (precipitation, water level, flow, hydrology information); (c) water quality data (temperature, pH, dissolved oxygen, conductivity, turbidity, ammonia nitrogen, total phosphorus, total nitrogen, permanganate index, fluoride), (d) monitoring of soil and water conservation, illegal construction and solid waste dumps; and (e) drainage and solid waste management (drainage networks, conveyance systems, sewage pipelines and pump stations).

<sup>10</sup> Key tasks for the mechanism stipulated in the working guidelines include: (a) conducting studies to support planning of transboundary rivers and lakes; (b) implementing the water resource management mechanism; (c) jointly promoting shoreline protection of the Yangtze River; (d) jointly promoting water pollution reduction and eutrophication management; (e) jointly promoting river and lake ecological protection and restoration; (f) jointly enforcing relevant regulations and policies; (g) establishing a monitoring network covering hydrology, water quality, water ecology, and so forth; (h) establishing information sharing and river health assessment; (i) conducting joint research on key issues including water ecology restoration technologies, horizontal eco-compensation and so forth; and (j) conducting information, education, and communication (IEC) activities and improving public awareness.

The RCS can be improved by the following: (a) Accelerated implementation of the basin-level mechanism and working conference for better coordination between the river basin organization and the provinces; (b) Integration and expansion of the data monitoring and information sharing platforms for a holistic and real-time understanding of biophysical conditions and river chief operations; (c) Deployment of advanced technologies such as remote sensing that can complement manual river patrols and provide insights for inter-jurisdictional decision-making; (d) Use of third-party monitoring and verification to strengthen the accountability of the river chiefs; (e) Development of guidance for public engagement in the form of manuals to share approaches and lessons across jurisdictions, including for climate change awareness; (f) Greater focus on gender balance in river chief appointments, both paid and voluntary.

#### Results Area 2: Advancing Ecological Protection through Integrated River Basin Management

21.

The Opinion required the river basin commissions and local water departments to consider the ecological flow requirements as rigid targets in water allocation.

Determination of ecological flow requirements for 52 rivers and lakes in the Yangtze River Basin was included in the tasks for the CWRC from 2020 to 2022 including Xiang, Zi, Yuan, and Li Rivers in Hunan and the Gan, Fu, and Xin Rivers in Jia

The Yangtze River Protection Law commits governments to increasing ecological water management in the Yangtze River Basin (Article 31). The law requires water resources department to include the ecological water volume in the annual water allocation plan to meet basic ecological flow demand of rivers and lakes, ensure ecological flow during the dry season and fish spawning period, and to maintain water levels in important lakes.

However, such plans only establish the water quota at the provincial level and require a further allocation to the county level.

Water dispatch plans are required to manage basin water use, jointly operate reservoirs, and respond to the emergencies of droughts and water contamination disasters, balanced with these ecological needs.

Actions have been identified based on the assessment to strengthen ecological flows and integrated river basin water environment management under the Program. These include: (a) Water resources allocation to the county level as the basis for water withdrawal licensing; (b) Ecological flows implemented and monitored against minimum performance standards; (c) Tailored river/lake ecosystem health evaluation guidelines developed by the provinces to guide the determination of ecological flows, which will then be used for ecological flow supervision in the demonstration sub-basins (this aims to extend minimum flow type ecological allocations for broader consideration of river ecosystem health considerations in line with international practice); (d) An inter-provincial river chief cooperation mechanism to strengthen integrated cross-border water environment management in the Yuan river;<sup>112</sup> and (d) A dedicated ecological environment management information platform for the Gan river, covering both water pollution control and ecological protection and restoration, with decision support function for more effective operational management and supervision.

The Yangtze River Protection Law requires governments to address point source and non-point source pollutants. Article 47 requires counties to improve urban and rural wastewater collection and treatment capacities, clarify entities responsible, and implement unified management of systems.

Support for counties under Results Area 3 aims to address these priorities with a focus on phosphorus pollution, which has become the primary pollutant in many areas of the Yangtze.

#### Improving Point Source Pollution through Improved Wastewater Management

26. China has invested substantially in its wastewater infrastructure systems since 1996 and achieved nearly universal coverage.

The study examines nutrient and plastics pollution concentrations, transmission pathways, hotspots, and policy options for their reduction.

Assessment in demonstration counties reveal that almost all the counties have sufficient wastewater treatment capacity, but face efficiency and management challenges. Challenges include: (a) the domestic wastewater management services are fragmented, with the treatment plants being managed by one entity, mostly outsourced private sector operators, while the sewer network is managed by the county bureau or county-level public entity or company, resulting in a lack of accountability for ensuring service quality; (b) influent concentrations (Biological Oxygen Demand [BOD] and COD) to the treatment facilities are usually low as a result of the combined effect of incomplete collection networks and household connections, mixed wastewater and stormwater drainage, and poor conditions of the existing network due to deferred maintenance, resulting in many WWTPs operating at a low efficiency level; and (c) a lack of sustainable financing with the costs of the domestic wastewater management services covered from two sources: (i) a wastewater service charge paid by the customers that typically covers only the outsourced treatment service provider who is responsible for the O&M of the WWTP and (ii) subsidies through budget allocations from the county finances, which are used for O&M of the wastewater collection system and often limited to urgent repairs.

In response to these challenges, the Program supports actions to strengthen integrated wastewater management services. Actions include: (1) Development of integrated wastewater management strategy in demonstration counties, including financial sustainability, integrated O&M, employment equity, workforce roadmap for women and climate resilience and low-carbon technologies; (2) Increased COD reduction (influent COD minus discharged COD) at township-level wastewater treatment plants; and (3) Integrated institution agreements: one entity responsible for O&M of sewer network and wastewater treatment plants.

The two main challenges are to provide adequate financial incentives to farmers for collection, and to establish financially sustainable channels for recycling. The Program will provide support for activities that address these challenges in support of high levels of collection and recycling in demonstration counties (see full technical assessment for county-level baselines and targets). Agricultural plastic film collection and statistics systems will be established with inventories made by the collection sites.

The Program (under Results Area 2) will further support development of a Provincial M&E protocol for agricultural film collection and recycling in Jiangxi, as well as support the implementation of the Provincial Implementation Plan for Strengthening Plastic Pollution Management in Hunan.

#### Addressing Non-Point Source Pollution through Manure Management

32.

Cognizant of these and other challenges within the agriculture sector, MARA issued the 2017 Notice of Five Actions for Green Development of Agriculture, including measures for: (a) improving management of livestock manure; (b) replacing chemical fertilizers with organic fertilizers; (c) encouraging straw treatment; (d) recycling agricultural plastic film; and (e) aquatic biodiversity protection.

Collection, separation, treatment and re-use or safe disposal of manure is critical for addressing these pollution challenges, and also contributes to GHG emissions mitigation.

Treated animal manure was mainly used as a replacement for chemical fertilizers (which could further reduce agricultural NPS pollution), as well as for producing gas and electricity, both pathways are effective at reducing GHG emissions relative to manure disposal in waterways or anaerobic ponds. The 14th Five-Year Period calls for (a) further increasing the resource utilization rate to 85 percent; (b) establishing a system of animal waste treatment, processing, and returning to the field as fertilizer; and (c) attracting private financing through innovative modes, including public-private partnership and other mechanisms. The county-level utilization ratio will be measured on farm sites as a sub-DLI (DLI 3.3), with the aim of gradually increasing the level of animal manure utilization in selected counties and maintaining the level of utilization where it is already high (no less than 80 percent). This intervention will be complemented by the development and dissemination of a provincial agricultural NPS pollution management best practice guidelines. Details on county-level production, utilization, and utilization target rates are presented in the full Technical Assessment.

<sup>111</sup> For example, Hunan has set a target for 80 percent recycling rate of agricultural film by the end of 2020 and almost complete recycling by 2025 with a complete agricultural film producing, selling, using, recycling, and management system established province wide.



In addition, a number of people were selected as civil River Chiefs to play an important role in promoting river management policies, collecting public feedback, supervising river chief performance and bridging communications.



Specific

private sector actors do not capture the economic benefits of most Program outcomes, limiting the possibility for private financing for many activities (that is, benefits are diffuse and public).

This economic assessment uses a simple BCA based on benefit transfer, applied at the sub-basin level for Poyang Lake and Dongting Lake Basins. The assessment implicitly combines activities under Results Area 1, Results Area 2, and Results Area 3 to value outcomes as a combined water environment quality improvement.

Of the US\$6,126 million

Government funding, it is estimated that US\$2,519 million will come from Jiangxi Province and US\$3,607 million will come from Hunan Province.

The economic values of water quality and ecological improvement are challenging to quantify due to the dispersed spatial extent of benefits across the basin, the wide range (and indirect nature) of benefit types, and data limitations.

These studies utilize the contingent valuation method<sup>12c</sup> (CVM) to capture the broad range of benefits (both use and non-use economic values) that are expected. Economic assessment at the lake basin level considers the benefits from the program as a whole (that is, as a package of activities) within its basin areas, thus capturing the bulk of provincial-level and county-level activities.

<sup>12c</sup> Contingent valuation method uses questionnaires targeted to impacted populations to elicit their WTP for non-market environmental goods, such as avoidance or reduction of pollution impacts.

Net economic benefits are positive under a range of discount rates based on conservative assumptions.<sup>121</sup> Overall program benefits have been projected with the assumptions that (a) investment will be completed within 5 years; (b) benefits will accrue starting from year 5 for a total of 15 years, with full benefits being reached from year 7 onward; (c) operating and maintenance costs of infrastructure and other recurrent costs will be 10 percent of the total program investment cost; and (d) discount rates are 6 and 12 percent.<sup>122</sup> (Table 3.10).

ERR and NPV of Water and Ecology Improvements in Program Sub-basins Based on Benefit-Transfer (US\$, millions)

|                                      | ERR (%) | NPV @ 6% | NPV @ 12% |
|--------------------------------------|---------|----------|-----------|
| Poyang Lake Basin (lower estimate)   | 15.7    | 1,957    | 1,590     |
| Dongting Lake Basin (lower estimate) | 18.3    | 3,684    | 752       |

<sup>121</sup> Day, B. and Mourato, S. (1998) Willingness to pay for water quality maintenance in Chinese rivers.

Willingness to Pay for Reducing Agricultural-Induced Water Pollution in Zhenjiang City, China.

Valuing Water Quality Improvement in China: A Case Study of Lake Puzhehei in Yunnan Province.

Public demand for remediating a local ecosystem: comparing WTP and WTA at Hongze Lake, China, Lake and Reservoir Management, 29:1, 23-32.

Technical Note on Discounting Costs and Benefits in Economic Analysis of World Bank Projects The discount rate is recommended to be 6 percent for investments with long-term unquantified social and environmental benefits.

Quantification does not include emissions reductions through institutional, policy and planning measures (DLI.1 and DLI.2) although these are expected to have considerable (but difficult to quantify) emissions mitigation benefits (see para.

Manure treatment and reuse is expected to be 1,048,300 tons (Hunan) and 473,100 tons (Jiangxi) due to Program activities.

Policies and plans implemented under DLI.2 are expected to lead to longer-term water quality improvements through reduced nutrient pollution and thus reduced eutrophication,<sup>13c</sup> through their support for nutrient pollution mitigation (the integrated water and environment management plan for the Gan River).

This calculation represents the net present value (at lower and upper bound prices) of the quantified emissions mitigation at a 6 percent discount rate, over 15 years consistent with the economic analysis. [Shadow Price of Carbon in Economic Analysis \(link\)](#).

Implementation of the Program will follow the existing national, provincial, and sectoral legal framework and practices for fulfilling public financial management, public procurement, and governance responsibilities.

The FSA assessed the public financial management system and the public procurement system of key program implementing agencies and their line agencies.

**Public Financial Management System.** The Budget Law of the People's Republic of China (PRC), issued in 2015 and revised in 2018, has set the budget management framework for the central government and local governments at all levels in China.

The budget quota of compensation fund is distributed to city/county government in two tranches. The first tranche which mainly comes from central government transfers is distributed in advance at the end of the previous year, and the second one mainly from provincial government is normally delivered in the second half of the current year. The city/county government used to integrate the first tranche in their annual government budget, but the treatment of the second tranche is various. Some counties included the second tranche in their annual budget based on the projection and made adjustment later on, while others just waited the distribution of budget quota.

Instead, sectoral departments were required to integrate various available financing sources. In addition, some of the upper level transferring funds are distributed to counties in the form of general budget rather than ear-marked budget, and counties are playing essential roles in deciding how to use the program funds although central and provincial government set up the requirement on minimized percentage of using transferring funds on program activities.

all levels have integrated all financial funds into the treasury single account (TSA) system.

Following the national policy and regulations issued by the MOF and NDRC, the provincial governments have issued a series of regulations regarding fund management, implementation measures, and result verification procedures, and so on.

TBL focuses on construction related works, goods, and consulting services, while GPL focuses on fiscal budget funds financed purchasing activities carried out by government departments, institutions, and organizations. The demarcation line is not very clear between the two until the issuance of monetary threshold <sup>13<sup>1</sup></sup> for tendering and bidding activities by NDRC and guidance documents by the MOF, NDRC, and respective line ministries.

The assessment analyzed data, interviewed, and discussed in person with procuring entities and public transaction centers (mandated by government for providing service and supervision to purchasing activities through open and selective bidding) on procurement legal framework implementation in practice.

During the fiduciary assessment, the major financial management risks have been identified and mitigation measures provided:

- (a) The financing sources of the program is quite comprehensive as it integrates funds from very broad sources and some of them are one time compensation funds. Multiple-year program budgeting should be prepared to ensure program funds could be secured and county government could prioritize its investment to enhance the efficiency of its scarce financing resources.
- (b) Budget quota was distributed to counties/cities in batches and some program funds were delivered in the second half year or even the year end which prevents the county government from including the entire program funds in its annual budget and delays the implementation of planned activities.

A blue tagging mechanism which can trace program expenditures from government existing integrated financial management system has been recommended and it is expected to be piloted, especially in those demonstration counties, during project implementation. This also creates fundamental basis for generating program financial reporting from the Government treasury system.

A tailored program financial reporting template will be designed which can capture the data from government system and used by the project upon agreed by related government entities.

Provincial entities involved should strengthen the supervision on program funds in line with related government decrees.

To avoid substantial deviation between contract price and the prevailing market price level, the PMO is required to regularly update the cost estimate by taking account of market variants in a timely manner to ensure realistic value for money is being achieved.

Human, financial and policy resources should be allocated by Hunan and Jiangxi PDRCs for close monitoring contract implementation progress to minimize or avoid foreseeable cost overruns and/or implementation delays.

**Provincial**

finance departments will decide when and how to implement this piloting by considering the readiness of government reform on the integrated financial management information system.

Provincial entities involved should strengthen the supervision on Program funds in line with related Government decrees.

The Program will support improvement in water and ecological quality in river and lake basins in Jiangxi and Hunan and is thus expected to bring overall E&S benefits. The implementation of activities under the Program will rely on the existing national and provincial legal framework and institutional system for managing E&S issues.

The Program will support pollution control and ecological restoration activities including construction and upgrading of county and township wastewater treatment plants and pipelines, agricultural plastics collection and recycle, waste treatment of existing livestock farms, and institutional and capacity-building activities. These activities will generate E&S benefits of reduced pollutant discharge to water bodies and improved river and lake water quality and basin ecological environment. Activities with the potential to cause significant adverse impacts on the environment and/or people are excluded, including activities that (a) involve closure or relocation of livestock, poultry, or aquaculture farming; (b) involve large-scale infrastructure construction; (c) have substantial impacts on river hydrology and ecology; and (d) involve the allocation or conveyance of water, including inter-basin water transfers or other activities, resulting in significant changes to water quality or availability.

**Assessment of Environmental and Social Management System.** A comprehensive review of the legal and regulatory framework for E&S management relevant to the activities supported under the PforR was conducted, including institutional arrangements, management procedures and their implementation, institutional capacity, and performance.

#### Environmental Management System.

In recent years, the Government of China has worked to reform its environmental management system by enhancing its law enforcement and prevention approach.

The key PforR government stakeholders involved in environmental, health, and safety management include various levels of ecology and environment bureau (EEB), health commission, emergency management bureau, construction bureau, water resource bureau, and agriculture and rural affairs bureau.

The assessment results also indicate inadequacies in the

implementation of some environmental management systems, mainly including weak environmental protection and participation awareness of farmers in chemical fertilizer reduction and agricultural plastics recycling, and inadequate OHS training for contracted and temporary workers involved in the waste collection activities.

Subject to the potential social impacts and risks identified, the social system

assessment focused on the dimensions concerning social impacts and risks assessment and management system, cultural heritage protection, occupational health and community safety, land acquisition and resettlement, public participation, ethnic minorities, and vulnerable groups.

Jiangxi and Hunan have established management agencies with clear responsibilities and qualified staff at the

provincial, municipal, and county levels for managing corresponding social risks and impacts.

The cultural departments are responsible for managing

adverse impacts on physical cultural heritage. The natural resource bureaus enforce land acquisition, compensation, and resettlement with the support of and coordination by township governments and village committees.

## The key

recommendations are as follows:

- (a) Provide training on chemical fertilizer use and agricultural waste management to farmers.
- (b) Hunan provincial (and county) agriculture and rural affairs bureau should establish a sustainable incentive mechanism to increase the collection rate of agricultural plastics, in which the existing jobholders should be appropriately considered, for example, the village cleaners.
- (c) Enhance the OHS management of the enterprises involved in the Program activities.

The PIAs shall monitor and record the implementation of social impacts and risks (including land acquisition and resettlement impacts, support for vulnerable groups, and so on) screening, mitigation measures implementation, information disclosure, public participation, and GRM.

- (a) Provincial and county agriculture and rural affairs bureaus shall provide trainings on chemical fertilizer use and agricultural waste management to farmers.

chemical fertilizer use and  
agricultural waste [redacted]  
management, and relevant  
records. [redacted]



The supported activities will promote cross-sectoral coordination and inter-jurisdictional cooperation toward improved water quality and ecological protection in the Yangtze River Basin.

This annex describes the central component motivation, connection to the provincial Program components, activities, financing, fiduciary, environmental, and social considerations.

A Program Steering Committee (PSC) will be led by the Office of the Leading Group for the Development of the Yangtze River Economic Belt under NDRC (YREB Coordination Office).

The Central Program Management Office (CPMO) will be hosted by the Changjiang (Yangtze) Water Resources Commission (CWRC). The CWRC is a river basin authority under the MWR, with a mandate to undertake integrated water resources management (including water conservation and allocation), basin planning, water infrastructure construction, and scientific and policy research. The CPMO will be responsible for coordination, reporting, management, including management of E&S social aspects, and M&E of the activities under the Central Basin IPF, the provision of capacity building, support to the PSC, along with Program implementation support, including consolidated Program reporting. The CWRC will host the CPMO given its alignment between its mandate and the Program objectives, plus technical capacity, to ensure an integrated river basin approach.

<sup>138</sup> The selected executing agencies will be required to establish a Management Office, headed by a qualified officer and supported by adequate staff, to manage all activities until completion.

The engagement of public institutes established practice in World Bank-financed projects in China, including in the GEF Mainstreaming Integrated Water and Environment Management Project (P145897), Economic Transformation and Institutional Capacity Building Project (P144270), Building a Modern Fiscal System Technical Assistance Project (P154694), Yunnan Highway Asset Management Project (P132621), and Guangdong Compulsory Education Project (P154621).

Activities supported by the Central Basin IPF are motivated by the objectives, roles, and responsibilities outlined in the Yangtze River Protection Law.

It defines high-level obligations on central, basin, provincial, and county governance including (a) basin-level coordination mechanisms; (b) standards, technical guidelines, and strategies for management of resource protection, ecosystem restoration and protection of biodiversity, along with pollution control; (c) provincial institutional strengthening, policy, and strategic planning; (d) sub-basin-level TA and innovations for integrated water environment management; and (e) county-level activities focused on reducing pollution loads, including plastics. The central component activities support the central government's implementation of the law across these areas (described in the following paragraphs), and further support provinces in implementation of the law in their areas of responsibility also through links to the provincial sub-programs.

These are aligned with the roles and responsibilities outlined in the Yangtze River Protection Law.

The sub-component will support establishment of a basin-level RCS collaboration mechanism (a forum for decision-making, coordination, and learning) within the CWRC to promote the coordination of river protection and restoration activities by river chiefs, and the establishment of a basin-level information sharing platform, envisaged to be linked to the existing national-level platform and provincial-level platforms.

The objective of this sub-component is to provide research inputs for policies and technical guidelines for freshwater ecosystem restoration and protection.

This research will provide guidance in implementing river health and ecological flow under the law. This sub-component will support research on freshwater ecosystems and river health using field surveys and desktop reviews to inform the guidelines. It will support the following activities:

(a) Research for river health guidelines.

The activity outputs will include technical guidelines for the assessment of aquatic ecosystems, focusing on the Dongting Lake, Poyang Lake Basins and tributaries to the Yangtze River.

This activity focuses on Poyang Lake and Dongting Lake, which are target sub-basins within the Program's provincial components, along with important tributaries such as Jialing River, Wujiang River, and Chishui River. The activity will propose mechanisms for coordinating protection and restoration efforts for the lakes, drawing on field surveys, desktop reviews, and domestic and international knowledge and best practices analysis.

This includes research on phosphorus sources and flows, which will support a total phosphorous management framework for the Yangtze River Basin, coordinated emergency response mechanisms and a set of technological solutions for the Yangtze River Basin, as required by the Yangtze River Protection Law and the provincial 14 FYPs.

The objective of this sub-component is to develop innovative incentive mechanisms for ecosystem protection. This activity will investigate the economic value of ecosystem services in the Yangtze River Basin; determine methods for integrating ecological data into existing statistical accounts; and design eco-compensation mechanisms and pollution fee standards for water quality, quantity, and ecological assets. The activity will address current difficulties in measurement, trading, liquidity, and property rights definition in eco-compensation and trading programs.

The cost table for the Central Basin IPF prepared by NDRC/CWRC has been reviewed by MoF who have confirmed up to CNY 48 million equivalent to be financed through the IBRD loan as part of the YRPERP. However, the actual amount during implementation will be based on the annual workplans agreed with the World Bank, and further reviewed through internal government budget processes.

The Central Basin IPF component focuses on Type II TA activities and would have broad E&S benefit. The Central Basin IPF aims at promoting cross-sectoral coordination and inter-jurisdictional cooperation toward the common goals of improving water quality and ecological protection in the Yangtze River Basin.

The Central Basin IPF is not anticipated to support any physical activities, directly draft policies or regulations, or support feasibility studies/technical designs for future investment projects.

For example, there could be construction/operation nuisance and community health and safety risks from civil works of physical investment projects following the TA recommendations, such as wastewater and solid waste collection and treatment facilities, sampling and monitoring stations, ecological remediation and river/lake connection works, and so on. Studies aiming to reduce pollutants (for example, phosphorus and plastic waste) released in the river basin may have downstream implications on resource efficiency and pollution management, such as relocation/shutting down/upgrading of industrial enterprises; reduced use of chemical fertilizer and pesticides; agricultural and industrial water efficiency improvement; and control and disposal of hazardous chemicals, agricultural wastes, and plastic wastes. The studies will also need to consider and assess potential impacts on aquatic life, water rights, water uses, ecosystem services and broader implications from the perspectives of hydrology, climate change, sedimentation, urbanization, and industrialization.

However, adopting and enforcing the study outputs could have potentially significant downstream social changes among relevant communities; enterprises; institutions; and vulnerable groups (such as ethnic minorities, the workers, farmers, and so on) through regulating land and resources use and constructing and operating physical facilities to improve water quality and improve ecological environment, and so on.

An ESMF and an SEF have been prepared for the Central Basin IPF consistent with the E. The ESMF screened the potential E&S risks and established the principles, procedures, and requirements for managing the underlying E&S risks and impacts of the TA activities.

Both the ESMF and SEF provide operational guidance for applying relevant ESSs to TA activities and creating added value for enhancing the operationality of policy recommendations while incorporating solid considerations on significant E&S risks.

The CPMO shall ensure that the TA implementing agencies shall carry out a focused E&S assessment to assess the potential downstream risks, and the policy recommendations shall include appropriate recommendations consistent with ESF requirements.

The CPMO will monitor the E&S performance of the Central Basin IPF and report to the World Bank on a semiannual basis.

## Fiduciary

### Financial Management

13. The CPMO established within the CWRC is responsible for the overall financial management of the central component.

The financial staff are required to take the self-learning on the E-learning platform developed by the World Bank and pass the test before the signing of loan agreement.

Since it is hard to define the scope of government investment and collect the required financial data, it is agreed that the Central Basin IPF will be solely financed by IBRD loan and no counterpart funds will be accounted and reported.

One

DA in Chinese yuan will be opened and managed by the CWRC.

Direct payment and reimbursement from the loan account may also be used, provided the WA value is above the minimum application amount.

The World Bank loan for the IPF component would disburse against 100 percent of eligible expenditures (taxes inclusive), consisting of goods, consulting services, non-consulting services, training and workshop, and incremental operating costs.

The CWRC will prepare annual loan utilization plan and submit to MOF for approval by the end of November each year. The approved annual plan will be submitted to the World Bank as well.

The World Bank loan proceeds will flow from the World Bank into project DA to be set up at and managed by the CWRC.

To ensure proper usage of project funds, payment requests will be prepared by CPMO and reviewed by related divisions of the CWRC by following its internal procedures (the procedures have been documented in project financial management manual).

A centralized project financial management mechanism would be adopted in the project, that is, all project disbursement- and financial management-related tasks would be handled by the PMO within the CWRC.

PMO will be managing, monitoring, and maintaining its project accounting records for the activities they execute. The unaudited semiannual project interim financial reports (format and content in accordance with the abovementioned Circular No.13 agreed with the MOF) will be prepared and furnished to the World Bank by PMO no later than 60 days following each semester, in form and substance satisfactory to the World Bank.

PMO will be responsible for day-to-day FM work and submitting project financial reports to the World Bank in compliance with legal documents; (b) the CWRC will oversee the project DA and the using of the World Bank loan for its intended purpose; (c) appropriate FM duty segregation in the PMO; and (d) annual external audit to evaluate the performance of the overall internal control system.

The foreign funds audit center within CNAO has been assigned by CNAO as auditor for the project. The annual audit report will be issued by the foreign funds audit center, who have extensive experience with previous World Bank projects and is deemed acceptable to the World Bank.

The CPMO will be responsible for submitting the annual audit report of the project financial statements to the World Bank within six months after the end of each calendar year (June 30).

This requirement is stipulated in the Loan Agreement.

Working closely with the CWRC are various public entities that could be selected as executing agencies, in accordance with eligibility criteria acceptable to the World Bank, for implementing activities covering their respective mandates following government policies and arrangements.

The remaining activities under the project (apart from activities to be carried out by selected executing agencies), and any contract-based procurement carried out by a selected EA (apart from incremental cost financed activities) will follow the World Bank Procurement Regulations (November 2020) for selection of the most appropriate consultant(s) / supplier(s) / contractor(s) to carry out the assignment(s).

The Basin IPF would finance TA, goods and non-consulting services, and incremental operating expenses.

The PP will be updated in a way that reflects actual implementation needs and institutional capacity and will be agreed upon by the World Bank through STEP.

This ensures comprehensive information on procurement and implementation of all contracts for goods, non-consulting services, and consulting services awarded under the whole component will automatically be made available. This tool will be used to manage the exchange of information (such as procurement documents, bid evaluation reports, no objections, contracts, and so on) between implementing agencies and the World Bank. The World Bank team will provide training to the borrower on how to establish its account and use the STEP tool.

These will need to be followed for project procurement activities, which will be agreed upon based on specific World Bank procurement requirements and the justifications provided in the PPSD.

In addition to prior review, supervision carried out from the World Bank offices, World Bank procurement supervision missions will visit the field at least once a year to carry out procurement supervision or post-review of procurement activities.

Support for implementation of the PforR will require close attention and continuous support from the World Bank team.

Emphasis is placed on (a) supporting early-stage implementation and building institutional capacity; (b) reviewing implementation progress (including that of the PAP) and achievement of Program results and DLIs; (c) providing support to resolve emerging implementation issues; (d) monitoring the adequacy of systems performance, and monitoring compliance with Legal Agreements; and (e) supporting the Government in monitoring changes in risks.

The strategy and approach for implementation support includes an emphasis on the technical, fiduciary, and E&S support needed during implementation. The World Bank team provided technical expertise during preparation and will continue to provide technical support during implementation, as well as guidance to the agencies on Fiduciary and E&S aspects to ensure completion of the actions agreed in the PAP.



2.

Senior Environmental Engineer

SENGL



