

TC Document

I. Basic Information for TC

▪ Country/Region:	PARAGUAY
▪ TC Name:	Developing an Investment Plan to support water resources management in the Pilcomayo River Basin in Paraguay
▪ TC Number:	PR-T1369
▪ Team Leader/Members:	Gonnelli, Gustavo Victor (INE/WSA) Team Leader; Moreno Moreno, Henry Alberto (INE/WSA) Alternate Team Leader; Ortega Oropeza Leticia (INE/WSA); Nalesso, Mauro (INE/WSA); Suriano Micaela Paula (INE/WSA); Palacios Arguello Maria Jose (INE/WSA); Lee Lee Sergio Kyu Chul (INE/WSA); Sosa, Victor (CSC/CPR); Lopez, Liliana M. (INE/WSA); Sanmartin Baez, Alvaro Luis (LEG/SGO); Youngmin Oh (INE/WSA); Crespín Villatoro, Alexandra (INE/WSA); Guichon, Matias (INE/WSA); Cuppens Arnoud (INE/WSA)
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	.
▪ Date of TC Abstract authorization:	02 May 2024.
▪ Beneficiary:	Ministry of Public Works and Communications of Paraguay
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	Korea Poverty Reduction Fund(KPR)
▪ IDB Funding Requested:	US\$500,000.00
▪ Local counterpart funding, if any:	US\$0
▪ Disbursement period (which includes Execution period):	36 months
▪ Required start date:	January 2025
▪ Types of consultants:	Firms and Consultants
▪ Prepared by Unit:	INE/WSA-Water & Sanitation
▪ Unit of Disbursement Responsibility:	CSC/CPR-Country Office Paraguay
▪ TC included in Country Strategy (y/n):	no
▪ TC included in CPD (y/n):	no
▪ Alignment to the Institutional Strategy 2024-2030:	Social inclusion and equality; Productivity and innovation; Environmental sustainability

II. Objectives and Justification of the TC

2.1 The Pilcomayo River Basin covers an extensive area of approximately 238,653 km² of northern Argentina (27%), southern Bolivia (36%) and western Paraguay (37%)¹. The Pilcomayo River is considered as one of the rivers with the greatest amount of sediment transport in the world with an estimated load of 125 million tons per year², which causes morphological changes in the riverbeds, water bodies and flood plains on an annual scale, which in turn generates flooding with consequent damage to the

¹ Numbers are based on the catchment delimitation realized in the framework of the recent Update of the Pilcomayo River Basin Management Plan ([RG-T3294](#))

² TESTA TACCHINO, ALEJO *et al* (2015, june). *Análisis de la crecida del año 2014 del río Pilcomayo en su tramo entre Villamontes y misión la paz*. XXV Congreso Nacional del Agua. Paraná, Argentina. ([Link](#))

population and deterioration of infrastructure, affecting economic activity. The basin is home to 1.8 million people, a large proportion of whom live in extreme poverty and are affected by recurrent droughts and floods. Around 850,000 people that live in the basin identify themselves as indigenous, 80% of whom live in Bolivia, 9% in Argentina y 3% in Paraguay³.

- 2.2 In 2023 within the framework of the technical cooperation RG-T3294 “Management of Water Resources in the Pilcomayo River Watershed” the Pilcomayo River Basin Management Plan⁴ was updated by carrying out a comprehensive hydrological analysis and identifying actions and investments necessary to be implemented in the short, medium and long term. A key outcome was the evaluation and prioritization of structural and non-structural measures, resulting in a list of 63 actions ordered by priority. Diverse criteria were used considering environmental, social, institutional and economical aspects, and stakeholders from the 3 involved countries participated during the identification and prioritization process. The most urgent actions and investments that were identified for the entire basin include: i) sedimentation control, (ii) improvement of the early warning system to mitigate extreme hydroclimatic events, (iii) water quality monitoring, (iv) groundwater monitoring and (v) sustainable fishery management with emphasis on indigenous populations and local community to promote food security. Most of the actions identified under RG-T3294 are at a descriptive level and do not specifically focus on investments for the Paraguayan region. While the outcomes of the previous TC offer a foundation, this technical cooperation aims to carry out the essential technical and socio-economic studies needed to develop technical dossiers that are ready for implementation.
- 2.3 This technical cooperation will support the Commission for the Regulation and Multi-Purpose Use of the Pilcomayo River of Paraguay (CNRP PY) of the Ministry of Public Works and Communications of Paraguay. The main objectives are to (i) prepare actions and investments identified in the updated Pilcomayo River Basin Management Plan to facilitate their implementation in future investment programs for the Paraguayan region of the Pilcomayo River basin and (ii) promote a program to improve institutional capacities focused on the sustainable management of water resources and water basin governance. In the Paraguayan region of the Pilcomayo River basin, water availability for human consumption faces major challenges. One of the reasons is the lack of continuity in discharges of the Pilcomayo River because of the large sediment transportation that generates permanent changes of the riverbed and the excessive sediment concentration in the water itself. Additionally, rainfall regime in the region is extremely variable, with the Pilcomayo Basin and the Chaco Central being the areas of Paraguay most affected by the La Niña phenomenon, which exacerbates droughts and rainfall shortages⁵. During prolonged dry spells, when both river and rainwater become absent, drinking water is being transported by tank trucks from

³ Updated Pilcomayo River Basin Management Plan (2023)

⁴ Executive Summary of the Updated Pilcomayo River Basin Management Plan ([Link](#))

⁵ Climate Risk Country Profile. World Bank Group. 2021. ([Link](#))

Asuncion⁶. Based on this context, the CNRP PY considers as a priority the elaboration of feasibility studies and pilot projects that aim to contribute to sustainable solutions for the water scarcity problems in the basin.

- 2.4 The technical cooperation is directly aligned with SDG 6 (Clean Water and Sanitation), by contributing to access to drinking water (6.1), water quality (6.3), efficient use of water resources (6.4), comprehensive management of water resources (6.5) and capacity building for management (6.A) and SDG 13 (Climate Action), by contributing to goals 13.1 (strengthen resilience and adaptation capacity), 13.3 (improve education and human and institutional capacity) and 13.b (promote mechanisms to increase capacity for planning in relation to CC). The operation is aligned with the second nationally determined contribution of Paraguay in the context of adaptation to extreme hydrometeorological events (droughts and floods) and the decrease in water availability, which is expected to guarantee water security.
- 2.5 In contexts where water is scarce or access to water and sanitation systems is poor or non-existent, women and girls are primarily responsible for fetching water for the household due to their traditional gender roles. Globally, 72% of this responsibility falls on them, while men and boys bear only 28%. As a result, during droughts, women and girls are disproportionately affected, not only in carrying out domestic and caregiving tasks but also in meeting their own basic personal hygiene needs during menstruation, pregnancy, and breastfeeding. This situation exacerbates gender inequalities, highlighting the need to incorporate a gender perspective into drought response plans. A new report from the United Nations Convention to Combat Desertification (UNCCD) and the Food and Agriculture Organization of the United Nations (FAO)⁷ emphasizes that women in several regions of the world are taking on significant leadership roles in addressing the impacts of drought. In light of this, two activities are proposed within this project: (1) conduct a study that differentiates between (a) the ways women and men use water, (b) how they obtain and manage it, (c) the inequalities they face in contexts of water scarcity, and (d) the barriers to their participation in this TC project, and, (2) based on the study's findings, promote equal participation of women and men during the development of the pilots (for example, design process of solutions related to rainwater harvesting and aquifer recharge) and ensure equal involvement during training for the operation and maintenance of solutions addressing water scarcity.
- 2.6 This TC is consistent with the new Institutional Strategy 2024-2030 and closely aligned with each of the prioritized objectives—reducing poverty and inequality, addressing climate change, and promoting sustainable growth- by advancing sustainable solutions to enhance water security for vulnerable communities and ensuring a more efficient use of water resources. The sustainable management of the Pilcomayo basin's limited water resources, including extreme events such as floods and droughts, is essential for adapting to climate change while safeguarding natural resource

⁶ News article “Water for the Chaco: they urge to increase the supply” LaNacion. 01 August 2024. ([Link](#))

⁷ Aguilar, Lorena (2024). Women-led solutions for drought resilience. Bonn, Germany: UNCCD & FAO. [Link](#).

conservation. Additionally, the TC is aligned with several cross-cutting focus areas such as social protection and human capital development, gender equality and inclusion of diverse population groups, and sustainable, resilient, and inclusive infrastructure. By incorporating institutional strengthening in water basin governance, the TC also supports institutional capacity building, citizen security and regional integration.

- 2.7 Additionally, this technical cooperation is aligned with the Bank's Strategy with Paraguay 2019-2023 (GN-2958) because it focuses on supporting improvements in public management and institutions, providing resources to enhance efficiency in their processes, as well as the sustainability of productive and resilient infrastructure, and leveraging and positioning the human capital involved in the provision of services that enhance the quality of life of the population.
- 2.8 An important lesson from the regional TC "Management of Water Resources in the Pilcomayo River Watershed" (RG-T3294) is the need for active stakeholder participation from the beginning, including private sector actors (especially agricultural producers) and local communities located in the study area. This involvement is essential to ensure that the proposed sustainable water management solutions are relevant and practical within the local context and that the final investment plan receives broad support. Developing pilot projects to show social and economic benefits, along with technical feasibility, is expected to increase stakeholder backing. A second general lesson emphasizes the importance of training local technical staff and improving their skills and knowledge through exchanges with institutions that have successfully implemented sustainable water basin management practices.
- 2.9 The TC will be financed with funds from the Republic of Korea and is aligned with the Korean Poverty Reduction Fund (KPR) whose objective is poverty reduction and social development, including improvement of living conditions and access to social services such as water and sanitation.

III. Description of activities/components and budget

- 3.1 **Component I: Feasibility studies of investments identified in the Pilcomayo River Basin Management Plan (US\$200,000.00).** This Component includes the elaboration of at least three feasibility studies of projects identified within the framework of the updated Pilcomayo River Basin Plan and that aim to contribute to sustainable solutions for the water scarcity problems. The feasibility studies should consider technical, institutional, financial, economic, social, legal, and environmental perspectives, and include a cost-benefit analysis, environmental impact assessment and a gender analysis. These feasibility studies must allow for public bidding for contracting in accordance with national regulations, including the final design of the project or intervention, technical specifications, detailed budget, execution schedule, and estimated operation and maintenance costs. Examples of possible feasibility studies are (i) Sustainable exploitation of the Pilcomayo Aquifer, (ii) Artificial recharge of shallow aquifers for storage and exploitation, (iii) Regulation of the water use for the

Pilcomayo, (iv) Strengthening of sediment monitoring and (v) Assessment of Water Availability for the Lower Basin – Subsurface Components.

- 3.2 **Component II: Development and monitoring of two pilot projects to support the improvement of water resources management in the Pilcomayo River Basin (US\$200,000.00).** The objective of this Component is developing at least two pilot projects in the Paraguayan region of the Pilcomayo River Basin that showcase the technical feasibility and the economic and social benefits of the measures studied in Component I. Examples of possible pilot projects are (i) Sustainable exploitation of the Pilcomayo aquifer for human consumption and agricultural production taking into account the transboundary nature of the basin and (ii) stormwater harvesting and artificial recharge of shallow aquifers in the Pilcomayo River Basin as an alternative water source for human consumption and agricultural production, considering gender approach. This component includes the development of indicators to quantify economic, social and environmental benefits. Training sessions will be organized on the operation and maintenance of solutions addressing water scarcity. The knowledge and skills acquired during the development of the pilot projects will be documented and disseminated in both Spanish and Guarani through various communication channels, such as explanatory videos, interactive infographics, and didactic manuals.
- 3.3 **Component III: Capacity development on water basin governance (US\$80,000.00).** This Component includes: (i) Development of a case study on water basin governance and its applicability to Paraguay, (ii) Implementation of a capacity development program tailored to the specific needs of the local technicians that pertain to the technical bodies of Paraguay within the TCN to support the integrated management of water resources in the Paraguayan region of the Pilcomayo River Basin, as well as to advance a more integrated transboundary vision aiming at the protection of the trinational basin and (iii) Knowledge exchange with the Korean Ministry of Environment and other relevant agencies on water resources management and governance.
- 3.4 **Component IV: Coordination and Dissemination (US\$20,000.00).** Organization of kick-off and closing workshops to establish better communication and facilitate interaction and exchange of information and experience between different stakeholders. Publication and dissemination of a technical note, including the gender activities and its results.
- 3.5 The total budget of the TC is US\$500,000.00. The TC does not include local counterpart funding. The TC funds will be used to finance the hiring of consulting firms and individual consultants for the delivery of verifiable products, as well as travel expenses related to the performance of their duties. The execution and disbursement period for this TC will be 36 months. The following table presents the detailed budget of the TC by component.

Indicative Budget

Component	Description	IDB/Fund Funding	Counterpart Funding	Total Funding
Component 1	Feasibility studies of investments identified in the Pilcomayo River Basin Management Plan	US\$ 200,000.00	US\$ 0.00	US\$ 200,000.00
Component 2	Design of two pilot projects to support the improvement of water resources management in the Pilcomayo River Basin	US\$ 200,000.00	US\$ 0.00	US\$ 200,000.00
Component 3	Capacity Development on water Basin Governance	US\$ 80,000.00	US\$ 0.00	US\$ 80,000.00
Component 4	Coordination and Dissemination	US\$ 20,000.00	US\$ 0.00	US\$ 20,000.00
	Total:	US\$ 500,000.00	US\$ 0.00	US\$ 500,000.00

- 3.6 The execution of the TC will be carried out by the IDB's Water and Sanitation Division through the TC team leader and the sector specialist in the country, supported by the operations analyst assigned to this TC, as well as by the fiduciary specialists of the Bank's representation in Paraguay. The Sectoral Specialist will also be responsible for approving the products of this TC. While the studies are being carried out, workshops will be held with local technical staff to transfer knowledge, aimed primarily at officials from the institutions involved. These workshops will include activities to sensitize officials on the importance of including the gender approach in the project cycle for water resource management.
- 3.7 The execution will be monitored through the following mechanisms: (i) technical working meetings between CNRP PY and the Bank and (ii) review of the technical reports to be submitted by the consultants, by both CNRP PY and the Bank. During the operation's execution period, the Team Leader will prepare an annual monitoring report in accordance with the provisions of the document The Technical Cooperation Monitoring and Reporting System (OP-1385-4).

IV. Executing agency and execution structure

- 4.1 At the Request of the Government of the Republic of Paraguay (Annex), the Bank, through the Water and Sanitation Division (INE/WSA), will be the Executing Agency (EA) for the TC. This execution arrangement is justified under OP-619-4 Annex 2 as: (i) the processes of contracting consultancy studies with local regulations may take time that would delay the achievement of the TC results and outputs; (ii) the Bank's experience in implementing technical support in the areas of water security and

integrated water resources management will contribute more effectively to the achievement of the TC objectives in a timely manner. The Bank and the beneficiary agree that the Bank's engagement would enhance national coordination and independence according to the criteria of impartiality, as various stakeholders may have different interests in the interventions; and (iii) the Bank's implementation contributes to ensure that lessons learned from the activities carried out are adequately disseminated in the region.

- 4.2 Due to the strategic nature of the proposed studies, the Bank's extensive experience in the matter, in addition to the need to centralize execution, it has been decided that the administration of this TC be carried out by the Bank. In addition, taking into consideration that its execution will provide an opportunity for learning, knowledge transfer and data collection for Bank staff involved in issues of water resources management, resilience and adaptation to climate change, which is a growing area of work for the IDB and for the INE/WSA division.
- 4.3 WSA/INE will act as the Responsibility Unit for these contracts and will oversee requesting proposals, evaluating and selecting consulting firms and individual consultants, as well as negotiating contracts and overseeing technical follow-up. The deliverables from the consultancies must be reviewed by the beneficiary CNRP PY who will appoint a technical counterpart to coordinate and monitor the TC outputs.
- 4.4 The disbursement period of the TC is 36 months. Activities to be financed with this TC operation are included in the Procurement Plan (Annex), which includes the hiring of individual consultants and consulting firms to achieve the objectives of the components and will be executed in accordance with Bank policies and procedures as follows: (i) Hiring of individual consultants, as established in the regulation on Complementary Workforce (AM-650); (ii) Contracting of services provided by consulting firms of an intellectual nature in accordance with the Corporate Procurement Policy (GN-2303-33) (iii) other non-consulting services in accordance with Policy (GN 2303-28).

V. Major issues

- 5.1 The main risks associated with this TC are: (i) the scarcity of existing reliable water resources data in the Pilcomayo River Basin, (ii) the remoteness of the study area, coupled with the fact that it is largely comprised of private property, poses significant challenges for the fieldwork required for the feasibility studies and development of case studies and (iii) the low institutional capacity of the country in water resources management.
- 5.2 Addressing the scarcity of existing data, the feasibility studies outlined in the TC provide an opportunity to generate new information on water resources in the Paraguayan region of the Pilcomayo. To this end, the terms of reference include two key activities: 1) a detailed review of existing information and stakeholder consultations, and 2) fieldwork and data collection. The first activity will help systematize and digitize locally available data and measurements, while the second will facilitate the generation of new data through activities such as monitoring

campaigns for water quantity and quality, sediment monitoring, geophysical exploration, and pumping tests for aquifer characterization.

- 5.3 To address the operational challenges posed by difficult terrain conditions, demonstrating the anticipated benefits to local stakeholders (mainly agricultural producers and local communities) during the opening event can increase willingness to provide access to private properties and to support field activities. Consulting firms should closely coordinate their efforts with CNRP PY, which has established strong relationships with local stakeholders and has a comprehensive understanding of the on-the-ground situation. To account for potential delays due to challenging terrain conditions, adequate time has been allocated for the feasibility studies (total duration of 24 months) and case studies (total duration of 18 months). All feasibility studies are set to commence simultaneously in 2025, with the final study scheduled for completion in 2027 to foresee any operational issues that may arise.
- 5.4 The CNRP PY should actively promote collaboration with other governmental institutions, such as MADES, during the development of the case study on water governance outlined in the third component. This collaboration will facilitate resource sharing, enhance coordination, and strengthen institutional frameworks, ultimately resulting in more effective management of water resources in the Paraguayan region of the Pilcomayo basin.
- 5.5 Given the transboundary nature of the basin, it is essential for the CNRP PY to communicate effectively with their counterparts in Argentina and Bolivia regarding the execution of the TC. This collaboration will support joint decision-making processes and ensure that future interventions in the Paraguayan region align with the overarching goals of integrated management for the Pilcomayo basin.

VI. Exceptions to Bank policy

- 6.1 This TC does not contemplate any exceptions to Bank policy.

VII. Environmental and Social Aspects

- 7.1 This Technical Cooperation is intended to finance pre-feasibility or feasibility studies of specific investment projects, and the environmental and social studies associated with them; therefore, the terms of reference and products of this TC will be consistent with the applicable requirements of the Bank's Environmental and Social Policy Framework (ESPF).

Required Annexes:

[Request from the Client 77871.pdf](#)

[Results Matrix 52277.pdf](#)

[Terms of Reference 29517.pdf](#)

[Procurement Plan_95201.pdf](#)