

PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC28139

| | |
|---|---|
| Project Name | Peru Integrated Water Resources Management (P151851) |
| Region | LATIN AMERICA AND CARIBBEAN |
| Country | Peru |
| Sector(s) | General water, sanitation and flood protection sector (100%) |
| Theme(s) | Water resource management (100%) |
| Lending Instrument | Investment Project Financing |
| Project ID | P151851 |
| Borrower(s) | REPUBLIC OF PERU |
| Implementing Agency | National Water Authority of the Ministry of Agriculture - Autoridad Nacional del Agua (ANA) |
| Environmental Category | B-Partial Assessment |
| Date PID Prepared/ Updated | 07-Jun-2016 |
| Date PID Approved/ Disclosed | 14-Jun-2016 |
| Estimated Date of Appraisal Completion | 01-Feb-2017 |
| Estimated Date of Board Approval | 30-Mar-2017 |
| Concept Review Decision | Track II - The review did authorize the preparation to continue |

I. Introduction and Context Country Context

The situation of water resources in Peru has been heavily influenced by the ongoing development of water intensive productive sectors. The development of mining and irrigated agriculture and growing urban centers, with limited provisions to mitigate against contamination of waterways or to enhance water use efficiency, has led to a significant increase in water use. Increasing water scarcity is a major issue in many river basins in the country, especially those in the Pacific watershed, where most of economic activities and exports are taking place and more than half of the country's population reside, but which receives only 1.8 percent of the country's water resources endowment. The deterioration of water quality due to various point and non-point pollution such as insufficient wastewater treatment in urban and industrial areas, unrestrained dumping of municipal and industrial solid waste, and uncontrolled use of agrochemicals is affecting people's health, increasing the cost of potable water supply treatment and reducing opportunities for agricultural exports. In particular, high levels of pollution are concentrated around cities in the coastal areas, a

problem compounded by water scarcity. Climate change is also raising the complexity of water resources management, as uncertainty over hydrological parameters increases. Figures from the Special Report on Emissions Scenarios indicate that Peru will see the greatest temperature rises due to climate change. These figures predict a dry season average temperature increase in the range of 0.7°C and 1.8°C by 2020 and between 1.0°C and 4.0°C by 2050. Further, Peruvian piedmont and coastline are also prone to floods and mudslides due to high precipitation in degraded upper basins. In contrast, the southern part of the country is affected by droughts. In general, the frequency and intensity of floods and droughts has increased in some basins due to the continuous deterioration of watersheds and climate change impacts, including glacial retreat and variability in precipitation patterns.

Sectoral and Institutional Context

The situation of water resources in Peru has been heavily influenced by the ongoing development of water intensive productive sectors. The development of mining and irrigated agriculture and growing urban centers, with limited provisions to mitigate against contamination of waterways or to enhance water use efficiency, has led to a significant increase in water use. Increasing water scarcity is a major issue in many river basins in the country, especially those in the Pacific watershed, where most of economic activities and exports are taking place and more than half of the country's population reside, but which receives only 1.8 percent of the country's water resources endowment. The deterioration of water quality due to various point and non-point pollution such as insufficient wastewater treatment in urban and industrial areas, unrestrained dumping of municipal and industrial solid waste, and uncontrolled use of agrochemicals is affecting people's health, increasing the cost of potable water supply treatment and reducing opportunities for agricultural exports. In particular, high levels of pollution are concentrated around cities in the coastal areas, a problem compounded by water scarcity. Climate change is also raising the complexity of water resources management, as uncertainty over hydrological parameters increases. Figures from the Special Report on Emissions Scenarios indicate that Peru will see the greatest temperature rises due to climate change. These figures predict a dry season average temperature increase in the range of 0.7°C and 1.8°C by 2020 and between 1.0°C and 4.0°C by 2050. Further, Peruvian piedmont and coastline are also prone to floods and mudslides due to high precipitation in degraded upper basins. In contrast, the southern part of the country is affected by droughts. In general, the frequency and intensity of floods and droughts has increased in some basins due to the continuous deterioration of watersheds and climate change impacts, including glacial retreat and variability in precipitation patterns.

In 2009, the outlook for sound water resources management improved substantially with the approval of a new Water Resources Law (Law No. 29338) and the creation of the National Water Authority (ANA for its acronym in Spanish - Autoridad Nacional del Agua) to oversee its implementation and act as the regulator. The new Water Resources Law consistent with international good practices is based on the principles of integrated water resources management (IWRM), namely integration of sectoral policies, participation of stakeholders, management of water resources at the basin level, and recognition of water as a social and economic good.

ANA is the governing body for water resources management in Peru, in charge of establishing rules and norms for water resources management (WRM) in accordance with the Water Resources Law and enforcing their implementation through control and sanctions. ANA does not have the mandate of implementing infrastructure projects. As such its main functions include: water resources planning at basin and national levels; setting economic incentives to increase water use efficiency

and decrease pollution; issuing and controlling water rights and discharge permits; collection, analysis and dissemination of water related information; setting-up and controlling ambient water quality standards and environmental flows in coordination with the Ministry of Environment; riverbed management; promoting stakeholders participation in WRM; water conflicts management; climate change adaptation in water resources; and water-related risk management, including dam safety.

ANA is ascribed to the Ministry of Agriculture and Irrigation (MINAGRI for its acronym in Spanish - Ministerio de Agricultura y Riego), an arrangement which carries the legacy of a past where the management of water resources was focused on increasing the availability of water for irrigation expansion. Two mechanisms are in place to mitigate the risks of lack of impartiality resulting from ANA being ascribed to MINAGRI: (a) at the central level, ANA has a multisectoral board of directors composed of a representative from each of the following 13 entities/groups: MINAGRI; the Ministry of Environment (MINAM for its acronym in Spanish - Ministerio del Ambiente); the Ministry of Housing, Construction and Water supply and Sanitation (MVCS for its acronym in Spanish - Ministerio de Vivienda, Construcción y Saneamiento); the Ministry of Energy and Mining; other productive public sectors; health and sanitation public sectors; regional governments; rural municipalities; agrarian water users organizations; non-agrarian water users organizations; rural communities (comunidades campesinas); native communities (comunidades nativas); National Maritime Authority; and (b) at the river basin level, river basin councils (CCs for its acronym in Spanish - Consejos de Cuenca) are being established to ensure stakeholders participation in WRM.

ANA is composed of a central office in Lima and regional offices (AAAs for its acronym in Spanish - Autoridades Administrativas del Agua), each responsible for one of Peru's 14 hydrographic regions. The 14 AAA have local offices (ALAs for its acronym in Spanish - Administración Local de Agua) and are responsible for a river basin or group of river basins. These deconcentrated bodies of ANA are responsible for the management of water resources at the local level and are supported in their functions by the CCs.

The CCs are responsible for facilitating cross-sectoral and stakeholder participation in WRM planning and management. The newly created CCs have led the multi-stakeholder process to develop and monitor the implementation of IWRM Plans.

In addition to ANA, MINAM and the regional and local governments also have critical WRM responsibilities. MINAM is responsible for the generation of hydro-meteorological information through its Meteorological and Hydrological National Service (SENAMHI for its acronym in Spanish - Servicio Nacional de Meteorología e Hidrología). The regional governments are responsible for the operation and maintenance (O&M) of major public hydraulic infrastructure (i.e., headwork such as dams and inter-basin transfers transferred to them as part of the decentralization process). The regional and local governments, through their membership in the CCs, participate in basin-scale WRM planning and undertake water quality and discharge monitoring and control actions in their jurisdiction.

The World Bank has been supporting the implementation of the 2009 Water Resources Law as well as the establishment and strengthening of ANA through the Water Resources Management Modernization Project (WRMMP-P107666), co-financed with the Inter-American Development Bank, from 2010 to 2015, as well as a number of Reimbursable or Grant Funded Technical

Assistance activities.

The WRMMP successfully contributed to the implementation of the new legal and institutional framework at national level and in six pilot basins. Main outcomes of the WRMMP were the creation of CCs in each of the six pilot river basins and the formulation of their corresponding participatory basin water investment plans. Another significant achievement was the definition of the Methodology for setting water use and pollution charges, approved in December 2012. Today, collection of those charges accounts for 75 percent of ANA's revenues. They finance part of the administrative costs of ANA's office in Lima, as well as the newly created CCs. Other outcomes included: (i) the establishment of the basic infrastructure and the design of the National Water Resources Information System (NWRIS) as well as the strengthening of SENAMHI's and ANA's hydro-meteorological and water quality observation networks in those 6 basins all in the Pacific watershed; (ii) the improvement of water rights administration framework and the formalization and registration of 75,000 water rights and discharge permits in those priority river basins; (iii) the formulation and adoption of the national water quality strategy, whose implementation will be co-financed by an IDB project; (iv) increased human capacity through various training initiatives, including development and deployment of a Diploma program that has successfully capacitated more than 100 water resources professionals; and (v) the design and implementation of the Water Culture Program, which increased awareness of water quality and quantity issues among decision makers, water professionals, children (in partnership with the Ministry of Education) and general public.

Recognizing the long term needs and efforts to build and strengthen institutions, two Reimbursable Advisory Services (P151186 and P151190) and different Grant-Funded activities (listed in Table 1 in Annex 2.) supported the preparation of an action plan to strengthen ANA's human resources and organizational structure, establish a National Committee on Dam Safety; and develop a water fund in Piura.

However, experience elsewhere suggests that serious and sustained efforts in water resources management based on the principles of IWRM require long lead times. The actions mentioned above represent important first steps that need to be consolidated. The proposed Project would support ANA in consolidating these efforts and addressing some of the remaining gaps. Indeed, despite progress made since the issuance of the Water Resources Law in 2009, the management of water resources in Peru still presents serious challenges. Basin-scale, integrated and participatory WRM requires the continued empowerment of ANA so that it becomes a more respected Water Authority; including: (i) giving it more autonomy vis-à-vis MINAGRI; (ii) the establishment of adequate water governance in priority basins through the creation of additional CCs and the strengthening of the six existing ones so that they become strong and representative basin stakeholders entities with enough autonomy and financial resources to fulfill their mandate; (iii) the continued strengthening of ANA human resources (and their management) in charge of WRM; (iv) the further improvement in the availability and quality of water information and the development and (v) the implementation of adequate tools for the management of over-exploited aquifers and (vi) the creation of a legal and technical framework for dam safety management among others.

Water information gaps

Except for the six pilot basins in the Pacific watershed, the existing water resources information is still limited. Water data bases are incomplete, hydro-meteorological data are still in analog format and digital information needs to be reviewed for consistency and quality checks. Hydro-meteorological data is scarce; the observation network is incomplete and suboptimal for most of the country. Water data storage, backup and processing capacity in ANA is limited. Applications to translate data into valuable information for water resources management are still at an early stage. Complementary decision support systems need to be developed to close the data-information-knowledge chain.

Challenges in the management of groundwater

The Regions of Tacna and Ica rely primarily on groundwater to sustain agricultural activities that contribute significantly to the country's GDP, employment of labor force and livelihood activities. The Ica Valley, Villacuri and Yarada are among the most overexploited aquifers in Peru with estimated overexploitations percentages of 30 percent, 153 percent and 120 percent respectively. This situation has impacted groundwater quantity and quality creating conflicts among farmers and other groundwater users and increased susceptibility to land subsidence, particularly in these geologically seismic areas. Groundwater information and monitoring is limited resulting in a proliferation of illegal wells and the lack of control over water abstractions.

Dam safety

As in many Latin American countries, large hydraulic infrastructure, particularly dams in Peru, are aging. Currently ANA does not have a technical office responsible for dam safety. There is a lack of technical guidelines and procedures to evaluate dam safety risks and most of the surveying and monitoring infrastructure is obsolete. Some of the large dams in Peru can cause a severe damage in case of failure due to geological, hydrological or seismic risks.

Water resources management at basin level

Water resources management at basin level still needs to be strengthened. Water use information in the Pacific watershed is still limited, the mechanisms to enforce water rights are still weak and the control of water rights over withdrawals from ANA is still inefficient. Floods have become recurrent events in these basins and there is still a lack of early warning systems. Although CCs have been established, continued support is needed to ensure that these organizations are actively participating in planning and management of water resources and providing technical inputs to enhance design and efficiency of planned and existing water infrastructure.

Previous interventions at basin levels served as pilots for replication in similar basins in the Pacific watershed that broadly share similar challenges. There has been limited focus and interventions in central highlands (sierra) and rainforest (selva) basins that face a different set of challenges. The water quality and environmental concerns in the basins in the Atlantic watershed are growing. Conflicts over water quantity are also expanding since some basins in the Atlantic watershed are being considered as water sources for transfers to basins in the Pacific watershed. The tools (i.e., water information systems and water resources management plans) and the institutional set up (i.e., CCs) for water resources management in the Atlantic watershed are very limited. The basins of Mantaro, Alto Mayo, Urubamba-Vilcanota and Pampas were chosen through a process of modeling and prioritization based on hydrographic location, historical and cultural assets, socio-

economic conditions, environment and their perceived vulnerability to climate change and extreme events.

Relationship to CAS

The objectives of the Project are fully consistent with those of the FY12-16 Country Partnership Strategy (CPS) (Report No.66187-PE), in particular Strategic Objective III (sustainable growth and productivity) and Objective IV (improved public sector performance for greater inclusion).

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

The proposed Project Development Objective (PDO) is to strengthen the Borrower's capacity for the management of water resources at the national level and in selected river basins.

Key Results (From PCN)

The PDO will be measured against the following indicators:

- (a) National Water Resources Information System strengthened, showing an increase in data volume, reliability and use.
- (b) Groundwater monitoring plans for selected aquifers established and operational.
- (c) Economic tools to promote water use efficiency and reduce contamination strengthened.

III. Preliminary Description

Concept Description

The proposed Project will have the following components:

Component 1: Improving IWRM capacity at the national level (US\$26.00 million).

This component aims at improving the management of water resources at the national level through the development and operationalization of new methodologies and tools that will address the identified challenges in the following areas: (i) development of information products and analytical tools to support decision making for the management of water resources; (ii) conjunctive management of surface and groundwater in critical valleys; and (iii) management of dam safety. Elements included under this component are:

- a. Development of information products to support decision making for the management of water resources

Activities under this subcomponent would support the strengthening of the existing National Water Resources Information System to deliver better information products to support water resources management. This will be achieved through improving ANA's hydro-meteorological information network for data acquisition, strengthening water data bases and back-up systems, developing decision-making modelling tools for water resources management, and improving information accessibility to end-users.

- b. Evaluation and management of groundwater

Activities under this subcomponent would promote the conjunctive use of surface and groundwater in the aquifers of the Ica Valley and Villacuri in the Ica region and of La Yarada in the Tacna region to contribute to the reduction of over-exploitation. This will be achieved mainly through the creation of a stakeholders committee for the management and monitoring of the aquifer; the preparation of participatory aquifer management plans and the implementation of a system for the monitoring and control of groundwater.

c. Dam Safety

This subcomponent would strengthen ANA's regulatory framework and technical capacity for the management of dam safety. This will be done through: the definition of an improved institutional framework for dam safety management; the creation of a regulatory framework for dam safety management; the development of technical guidelines for dam monitoring, risk assessment and emergency plans formulation; the creation of a dam safety information platform; and the formulation and partial implementation of dam safety management plans for 6 major dams in the Pacific watershed.

d. Economic Incentives

This subcomponent would support ANA in the strengthening of economic incentives for increased water use efficiency and reduced pollution into water bodies as established in the Water Resources Law. This will include the revision of the water use and discharge charges; measures to increase its coverage and collection rate; and definition of rules and mechanisms to use part of those revenues to promote the implementation of basin water plans.

Component 2: Improving IWRM capacity at the basin level (US\$47.00 million).

This component aims at improving the management of water resources at basin level through: (i) the consolidation of the CCs established under the previous IBRD and IDB Projects in the Pacific watershed; and (ii) improving IWRM in new prioritized river basins in the Atlantic watershed where very little experience exists (Alto Mayo, Mantaro, Urubamba-Vilcanota and Pampas) Elements included under this component are:

a. Consolidation of the existing CCs: in the Pacific watershed (Chancay-Labayequé, Chancay-Huaral, Quilca Chili, Tumbes, Chira-Piura, Laocumba-Sama ➤ (Caplina)

The aim of this subcomponent is to strengthen the capacity of the existing CCs, inter alia:

- i) Monitoring the implementation of the River Basin Management Plans; including establishment of economic retribution of water use and discharge fees to incentivize efficient use of water resources as well as evaluating the creation of a Water Fund, using a share of the water resource use and contamination fees.
- ii) Supporting the enhancement of hydro-meteorological observation networks in rivers and reservoirs as well as facilitating two-way stream of communication that allows CCs to contribute monitoring data (generated by public or private sources) to the NWRS and obtain information necessary to support informed decision making
- iii) Developing and implementing flood forecast systems and formulating flood management plans for the six river basins.

- iv) Developing and implementing information systems and management tools for the monitoring, control and enforcement of water abstractions;
- v) Developing and implementing information systems and management tools for the monitoring of water quality and the control of illegal discharges to rivers and aquifers.
- vi) Support the CCs in the prioritization and formulation of investment projects that are part of the approved River Basin Management Plans.

b. Improving IWRM in new prioritized river basins in the Atlantic watershed (Alto Mayo, Mantaro, Urubamba-Vilcanota and Pampas).

The proposed interventions target central highlands (sierra) and rainforest (selva) basins that face a different set of challenges. This subcomponent aims at improving IWRM in new prioritized river basins in the Atlantic watershed through a series of activities that will be tailored to the challenges and needs of each basin. Interventions at basin level will include a combination of the following activities:

- i) Establishment of River Basin Water Resources Councils/Committees;
- ii) Development of participatory River Basin Water Resources Management Plans;
- iii) Creation of water quality monitoring programs ➤(including establishment of discharge standards and the installation of automatic water quality measurement equipment in the coordination with the Ministry of Environment;
- iv) Implementation of Cultura de Agua program ➤(aims at raising awareness and creating structured stakeholder involvement and outreach for the management and preservation of water resources;
- v) Development of basin-specific WRM instruments - to address key challenges. Instruments include, inter alia: simulation, optimization and decision support models/tools for flood and drought management and adaptation to climate change; payment of environmental services program; plans for the O&M of major hydraulic infrastructure; conflict resolution schemes and, support in the formulation of investment projects that are part of the River Basin Water Resources Management Plans.
- vi) Development of monitoring network ➤(design and implementation of real-time automated monitoring of water levels and existing water abstractions.

Component 3: Project Management and Supervision (US\$7.00 million).

This component would support Project management and implementation, including monitoring and evaluation.

IV. Safeguard Policies that might apply

| Safeguard Policies Triggered by the Project | Yes | No | TBD |
|---|-----|----|-----|
| Environmental Assessment OP/BP 4.01 | x | | |
| Natural Habitats OP/BP 4.04 | x | | |
| Forests OP/BP 4.36 | x | | |
| Pest Management OP 4.09 | | x | |
| Physical Cultural Resources OP/BP 4.11 | x | | |
| Indigenous Peoples OP/BP 4.10 | x | | |

| | | | |
|--|---|---|---|
| Involuntary Resettlement OP/BP 4.12 | | | x |
| Safety of Dams OP/BP 4.37 | x | | |
| Projects on International Waterways OP/BP 7.50 | | | x |
| Projects in Disputed Areas OP/BP 7.60 | | x | |

V. Financing (in USD Million)

| | | | |
|---|-------|-----------------------|---------------|
| Total Project Cost: | 80.00 | Total Bank Financing: | 40.00 |
| Financing Gap: | 0.00 | | |
| Financing Source | | | Amount |
| Borrower | | | 40.00 |
| International Bank for Reconstruction and Development | | | 40.00 |
| Total | | | 80.00 |

VI. Contact point

World Bank

Contact: Marie-Laure Lajaunie
 Title: Lead Water Resource Management
 Tel: 473-9733
 Email: mlajaunie@worldbank.org

Contact: Habab Taifour
 Title: Water & Sanitation Specialist
 Tel: 473-7280
 Email: htaifour@worldbank.org

Borrower/Client/Recipient

Name: REPUBLIC OF PERU
 Contact: Edmundo Gregorio
 Title: Sectorista de Agricultura y Medio Ambiente (DGIP/MEF)
 Tel: 6105900
 Email: fgregorio@mef.gob.pe

Implementing Agencies

Name: National Water Authority of the Ministry of Agriculture - Autoridad Nacional del Agua (ANA)
 Contact: Juan Carlos Sevilla
 Title: Jefe de la ANA
 Tel: 511-2243298
 Email: jsevilla@ana.gob.pe

VII. For more information contact:

The InfoShop
 The World Bank
 1818 H Street, NW
 Washington, D.C. 20433

Public Disclosure Copy

Telephone: (202) 458-4500
Fax: (202) 522-1500
Web: <http://www.worldbank.org/infoshop>

Public Disclosure Copy