

**Ex-Ante Evaluation (for Japanese ODA Loan)**

**1. Name of the Project**

Country: Republic of Peru

Project: River Basins Flood Protection Project in Coastal Area of Peru

Loan: November 7, 2014

Loan Amount: 2,480 million yen

Borrower: Republic of Peru

**2. Background and Necessity of the Project**

(1) Current State and issues of disaster prevention sector in Peru

Located on the circum-Pacific volcanic belt as Japan, Peru has potential risks of various natural disasters such as floods, earthquakes and landslides. In terms of disasters of a certain scale experienced by the country in the past, flooding is the most frequent type of disaster. Between 2003 and 2011, flooding occurred at least 200 times each year, affecting anywhere from tens of thousands to millions of people. The risk from large-scale flooding is particularly high during El Niño years, the flooding and landslide disasters caused by heavy rains occurred many times in every region of Peru during the El Niño events from 1982 to 1983 and 1997 to 1998, creating tremendous human and economic damage. Economic losses resulted from these El Niño events in 1982 and 1983 reached 3.3 billion US\$ in total, while those occurred in 1998 and 1999, a total of 3.5 billion US\$. Floods thus pose serious potential risks to the economic and social development of Peru.

Although facing such high risks of floods from heavy rains in the future, Peru has not yet prepared a holistic development plan that broadly covers management of river basins. As a result, agricultural land in river basins has not been protected against flood risks in farming areas. Current practice remains such post-flood response that local water-utilization associations provide temporary measures including levee construction and river channel dredging. Accordingly, these measures cannot prevent floods resulting from heavy rains, which will damage agricultural land. Agricultural production will be then seriously affected, posing an insecurity to the livelihoods of local residents, particularly those of low-income households with vulnerable economic base. Reducing flood risks through measures such as infrastructure development for flood control is a pressing issue that must be addressed for sustainable economic development in Peru.

(2) Development policies on disaster prevention sector in Peru and the Position of the Project

In its development strategy targeting 2021 titled “Bicentennial Plan (Plan Bicentenario) marking the bicentennial independence, Peru aims at “reducing vulnerabilities and strengthening disaster risk management to mitigate negative impact of El Niño phenomenon and achieve sustainable economic development.” The disaster risk management against El Niño phenomenon is one of the priority areas to be addressed with policy efforts at the national level. Also, under the Prime Minister’s Office (PCM),

National Institute of Civil Defense (INDECI) and National Center of Estimation, Prevention and Reduction of Disaster Risk (CENEPRED) have launched on developing a framework for disaster risk management. However, such effort is in the initial stage of inter-agency cooperation, ministries are pursuing their disaster risk management individually, where necessary. Among other agencies, Ministry of Agriculture and Irrigation (MINAGRI) is particularly committed to flood control to protect farmers and their agricultural land. To achieve “sustainable development” set out in one of its multi-year strategies targeting 2012 through 2016, MINAGRI intends to “address vulnerability in flood-prone agricultural areas by delivering infrastructure and non-infrastructure measures.” Specifically, it plans to invest 3 billion soles (about 1.15 billion US\$) in a total of 55 projects to carry out riverbank work for flood control and develop irrigation systems. To serve as a pilot project for flood control in Peru, this ODA loan project will support part of “Program for Mitigation of Vulnerabilities to Floods in Valleys and Rural Areas,” which is one of the top priorities in the above strategies. The project target sites are selected to protect the country’s major agricultural production areas located in river basins prone to frequent floods, which requires urgent mitigation efforts against their vulnerabilities.

(3) Japan and JICA’s Assistance Policy and Operating in disaster prevention sector

The Project is consistent with the Country Assistance Policy of the Government of Japan and JICA Country Analysis Paper for Peru in which disaster prevention measures are a priority area of their cooperation for the country. Notably, JICA has been supporting Peru’s disaster prevention efforts with its various cooperation schemes. In addition to a Loan Agreement for the Stand-by Emergency Credit for Urgent Recovery signed in March 2014, JICA is implementing a technical cooperation in a form of “Project for Enhancement of Earthquake and Tsunami Disaster Mitigation Technology in Peru (2010-2015),” and has also provided a grant aid for the “Project for Improvement of Equipment for Disaster Risk Management (2012-2016).

(4) Other Donor’s Activity

Setting a priority area of assistance for Peru in its disaster risk management, the World Bank granted a stand-by credit line for Natural Disaster Risk Reduction worth 100 million US\$ in 2010. In January 2014, IDB signed an agreement for a “Preliminary Loan for Natural Disaster Emergency,” totaling 300 million US\$. In order to strengthen Peru’s response to natural disasters, Andean Development Corporation (CAF) also established a stand-by credit line up to about 300 million US\$ in December 2013. No actual disbursement has been effected so far under these loan schemes.

(5) Necessity of the Project

As stated above, this Project aims to support disaster-prone Peru in implementing its disaster prevention efforts and mitigating adverse effects on agricultural production. The objective is consistent with development policies of the Peruvian government as well as with assistance policies of the Japanese government and JICA. Accordingly, both the needs and relevance for JICA’s support in implementing this project are high.

### 3. Project Description

#### (1) Project Objective

By implementing flood control measures including riparian improvements in its target areas in Peru's coastal plain, this Project is intended to reduce flood risks therein so as to ultimately contribute to sustainable local economic development in these regions and assure safety for local residents.

#### (2) Project Site/Target Area:

Lima (Cañete river basin) Ica region (Chincha river basin and Pisco river basin)

#### (3) Project Components (including the method of procurement)

With an objective of flood control, the project components include civil works and consulting services in three river basins in Peru's coastal plain.

##### 1) Civil works (International competitive bidding)

- Cañete river basin (River channel dredging, levee construction and riverbank work, and afforestation)
- Chincha river basin (River channel dredging, levee construction and riverbank work, diversion weir repairs, and afforestation)
- Pisco river basin (River channel dredging, levee construction and riverbank work, and afforestation)

##### 2) Consulting services (Review of the Detailed Design✕, review of tender documents\*, construction supervision, education for disaster prevention, support of capacity development for facility maintenance, preparation of a facility maintenance manual, and planning of river basin development (Procured through a shortlisting process)

\*In this Project, consulting services required for its Detailed Design will be financed by the Peruvian government. Japanese ODA Loan to finance this stage is exclusively a review work of the Detailed Design and tender documents prepared by the Peruvian government.

#### (4) Estimated Project Cost

7,528 million yen (out of which Japanese ODA Loan Amount: 2,480 million yen)

#### (5) Schedule

From October 2014 to May 2019 (total of 56 months). Project completion is defined as the initiation of the use of facility (scheduled in May 2018).

#### (6) Project Implementation Structure

##### 1) Borrower: Republic of Peru

##### 2) Executing Agency:

Irrigation Sub-sector Program of Ministry of Agriculture and Irrigation

(PSI: Programa Subsectorial de Irrigaciones, Ministerio de Agricultura y Riego)

##### 3) Operation and Maintenance System:

Local Water User's Organization (Junta de Usuarios in Spanish) will be responsible for the operation and maintenance of the river structures under the supervision of National Water Agency (ANA) that is administrating rivers.

(7) Environmental and Social Consideration/Poverty Reduction/Social Development

1) Environmental and Social Consideration

- ① Category: B
- ② Reason for categorization: The Project is not located in a sensitive area, nor has it sensitive characteristics, nor fall it into sensitive sectors under the JBIC Guidelines for Confirmation of Environmental and Social Considerations (April 2002), and its potential impacts on the environment are not likely to be significant.
- ③ Environmental permission and authorization: This Project is ranked in a Category I in which its potential environmental impact is considered minimal, according to applicable Peruvian laws. A brief environmental impact report (DIA: Declaración de Impacto Ambiental) with respect to the Project was duly prepared, and an environmental approval obtained for all the project sites in three river basins in December 2011.
- ④ Measures against pollution: While river-bed excavation can possibly affect a river topography, water quality and aquatic life, the Project will make these effects minimum by carrying out a construction phase in a dry season and detouring water flow from the construction section.
- ⑤ Natural environment: The target sites are not located in or around such areas as a national park that are susceptible to the effects of the Project, and an adverse impacts on the natural environment is expected to be minimal.
- ⑥ Social environment: The Project requires land acquisition totaling 5 ha in the target three river basins. It entails involuntary resettlement of 35 households to implement a sub-project in Cañete river basin. In pursuant to applicable Peruvian laws, land acquisition process and resettlement of local residents including payment of compensation will be handled by the Executing Agency.
- ⑦ Monitoring: During a construction phase, the contractor will carry out monitoring of noise, air quality and aquatic life associated with the project implementation. In a post-project phase, Water User's Organizations will conduct monitoring of water quality, aquatic life and other related factors under the supervision of ANA in the jurisdiction of MINAGRI.

2) Promotion of poverty reduction:

Reduction of flood risks in the target river basins will contribute to an increase in agricultural production, which in turn will raise the income level of farmers and thereby reduce poverty through promotion of local economies.

3) Promotion of social development (e.g. gender perspective, measures for infectious diseases including HIV/AIDs, participatory development, considerations for persons with disabilities):

This Project does not include activities specifically targeting promotion of social development.

(8) Collaboration with Other Schemes and Other Donors

Infrastructure provided by the Project, including embankments, is intended to mitigate effects of natural disasters, which requires proper maintenance and repairs to sustain its functions in the long run. While Water User's Organization have a certain level of experience in facility maintenance, it is essential to develop their capacities to maintain the enduring infrastructure. The Project will seek for the possibility of partnerships with other aid donors that are experienced in such capacity development of local Water User's Organization.

(9) Other Important Issues

With an objective of preparing against flooding, it is expected that the Project will mitigate inundation damage, in cases of precipitation augmentation by the climate change. Therefore, this Project could contribute to Adaptation against the Climate Change.

**4. Targeted Outcomes**

(1) Quantitative Effects

1) Operation and Effects

River Basin	Indicator	Baseline (value in 2008)	Target (2020)*1 【2 years after completion of the project】
Cañete River Basin	Annual maximum discharge *2	1,033m <sup>3</sup> /s	2,175m <sup>3</sup> /s
	Flood inundation area	1,200ha	167ha
Chincha River Basin	Annual maximum discharge *2	500m <sup>3</sup> /s	917m <sup>3</sup> /s
	Flood inundation area	2,352ha	1,020ha
Pisco River Basin	Annual maximum discharge *2	364m <sup>3</sup> /s	855m <sup>3</sup> /s
	Flood inundation area	859ha	312ha

\*1: Target is estimated for an event of a 50-year flood.

\*2: Annual maximum discharge is indicator for monitoring (based on daily discharge).

2) Internal Rate of Return

Based on the conditions provided below, the Economic Internal Rate of Return (EIRR) is estimated to be 23.23%.

Financial Internal Rate of Return is not applicable.

**【EIRR】**

Cost: Project Cost (tax excluded), cost of operation & maintenance

Benefit: Expected monetary value equivalent to mitigated flood damages on an annual average

Project life: 50 years

(2) Qualitative Effect:

The Project will contribute to reduction of flood risks, sustainable development of local economies, and enhanced climate change adaptation in its target areas.

**5. External Factors and Risk Control**

The Exciting Agency of the Project pursues land acquisition and resettlement of local residence as scheduled.

**6. Evaluation of Similar Projects and Lessons Learned from Past Projects**

One of the lessons learned from past projects, such as “Medan Flood Control Project” in Indonesia, demonstrates the importance of clarifying land ownership adequately associated with resettlement of local residents in the project sites involving riparian improvement. This Project entails resettlement of local residents up to 35 households in Cañete river basin (about 0.2% of approximately 20,000 beneficiaries). Accordingly, by obtaining information related to land ownership available at ANA, it will coordinate with Water User’s Organization that are familiar with localities including people to be displaced in order to make due arrangements for their resettlement pursuant to applicable Peruvian laws.

Furthermore, a lesson from “Agno River Flood Control Project (II) (II-B)” in the Philippines reveals that it is essential for this kind of project to integrate efforts to enhance public awareness for disaster prevention by implementing related activities and facilitating local people’s understandings of disaster prevention and the natural environment. Accordingly, a part of the consulting services in this Project will include learning opportunities about disaster prevention. The Project will design its contents to gain synergy effects combined with ongoing local efforts related to disaster prevention education in the target sites.

**7. Plan for Future Evaluation**

(1) Indicators to be Used in Future Evaluations

As provided in “4. Targeted Outcomes, (1) Quantitative Effects, 1) Operation and Effect Indicators”

(2) Timing for Next Evaluation: Two years after completion of the Project

End