

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

### **1. Name of the Project**

Country:	Republic of Peru
Project:	Sierra Small and Medium Irrigation Project
Loan Agreement:	March 30, 2012
Loan Amount:	4,406 million yen
Borrower:	Republic of Peru

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

#### **(1) Current State and Issues of the Agriculture and Irrigation Sector in Peru**

Agriculture is placed as one of the key industries in the Peruvian economy. The agriculture sector accounts for 7.5% of Peru's GDP, and approximately 4.82 million people, or 32.5% of the domestic working population, are engaged in this sector. Particularly in the Andes region, the agriculture sector serves as an important source of employment opportunities and means of income, accounting for 22% of the region's GDP and 80% of the working population.

However, due to such problems as limited arable land developed on steep terrain, inadequate irrigation (67.2% is rain-fed agriculture) and low levels of technology, agricultural productivity in the Andes region is generally low, and income levels are low. For this reason, the region's poverty rate (49.1%) is well above the national average (31.3%), and it means that economic disparity between regions is one of the most important issues for economic development in Peru. In order to raise the income levels of farmers in such a situation, it is absolutely essential that efforts be made to improve agricultural productivity, by promoting the efficient and sustainable use of water based on the new construction and rehabilitation of irrigation facilities, and by increasing the cropping intensity (ratio of used land) on limited arable land.

As well as a shortage of irrigation development, another challenge for the irrigation sector in the Sierra region is the stability of the water intake from rivers particularly during the dry season. The lack of rainfall in the region makes securing a stable supply of agricultural water difficult. In addition, in recent years, there have also been concerns about the effects of climate change, such as the loss of the reservoir function in the Andes region caused by the receding Andes glacier and the increase in the flows of glacier water into the water basin. As a consequence, there is an increasing need for conservation and water resource management of the entire basin area, such as afforestation activities designed to cultivate upriver districts and the prevention of upriver soil erosion, as well as the efficient use of water to adapt to water shortages caused by future glacier recession.

#### **(2) Development Policies for the Agriculture and Irrigation Sector in Peru and the Priority of the Project**

The new Humala administration was sworn in July 2011. In its administrative policies announced at the end of August, it positioned "social inclusion" with a stronger focus on the poor as an important development policy, while maintaining macroeconomic policies that have achieved high growth. In light of the serious income disparities between urban and rural areas and between the Pacific Coastal region and the Sierra region, the new administration has spelled out policies that focus on support for the Amazonian region and the Sierra region.

Furthermore, "Plan Bicentenario" (the Bicentennial Plan) sets forth Peru's national vision for 2021, and it contains six key strategic areas for achieving this vision. Under the "economic growth, competitiveness and employment" and the "regional development and the development of

infrastructure” strategic areas, it prescribes promoting public investment for the development of production and distribution infrastructure, such as water supply and irrigation facilities in regional and rural areas. Under the “natural resources and environment conservation” strategic area, from the perspective of using water resources efficiently, it incorporates specific goals aimed at the introduction and promotion of water-saving irrigation.

### **(3) Japan and JICA’s Policy and Operations in the Agriculture and Irrigation Sector**

“Poverty reduction and the correction of disparities” is regarded as one of the priority areas in Japan’s assistance to Peru, and as part of this, “poverty alleviation in the Sierra region” is named as one of the priority development issues. Under the Sierra Poverty Alleviation Program, JICA currently provides assistance for: improving the standard of living through electrification rates in regional areas via the Electric Frontier Expansion Project (III) (loan agreement: March 2009) (ODA loan); and improving the agricultural productivity of cash crops and improving the livelihoods of small-scale farmers through the building of agricultural production chains via the Project for Improving Livelihood of Small-Scale Farmers in Cajamarca (period of cooperation: 2011 – 2016) (technical cooperation project). Furthermore, JICA has also accepted four ODA loans, totaling 24.5 billion yen, such as for the development of agriculture and irrigation facilities in the Sierra and Coastal regions.

### **(4) Other Donors’ Activity**

Pointing to “growth acceleration and infrastructure expansion” as one of the priority areas of support for Peru, the World Bank supports improvements in agricultural productivity for the poor living in the Sierra region. In terms of projects co-financed with JICA, it has provided loans of 85 million dollars to the Programa Subsectorial de Irrigaciones (Irrigation Subsector Program) targeting the Coastal region and 51 million dollars to the Sierra Poverty Alleviation and Natural Resources Management Project. Furthermore, the Inter-American Development Bank (IDB) provides support for improving the productivity and export competitiveness of agricultural produce from the Sierra region, and the International Fund for Agricultural Development (IFAD) provides support aimed at strengthening the competitiveness of agricultural produce made by small-scale farmers living in the Sierra region, such as financing loans for rural communities, strengthening regional markets, managing natural resources and strengthening community organizations.

### **(5) Necessity of the Project**

This project is consistent with Peru’s development policy focused on poverty reduction and on the correction of social disparities in rural areas. Furthermore, it is consistent with Japan and JICA’s assistance policy, and so the necessity and validity of JICA supporting this project are high.

## **3. Project Description**

### **(1) Project Objective**

By engaging in the new construction and rehabilitation of irrigation facilities and strengthening organizations for water management in the Sierra region of Peru, this project aims to increase agricultural production, thereby contributing to the improvement of living conditions for local residents.

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

The Sierra region in 9 departments (Piura, Amazonas, Cajamarca, La Libertad, Ancash, Huánuco, Junín, Huancavelica and Ayacucho)

## **(3) Project Components**

This project is comprised of sub-projects including the new construction and rehabilitation of small scale irrigation facilities, the formation and institutional strengthening of water users associations, and activities for watershed conservation. It involves the following undertakings, including the new construction and rehabilitation of irrigation facilities covering an irrigation area of 17,000 hectares in the Sierra regions of nine departments. Capacity building and watershed conservation activities will be conducted, funded by the Peruvian government.

- 1) Civil engineering works (new construction and rehabilitation of irrigation facilities, construction of new irrigation canals, development of reservoirs, intake structure and water distribution facilities, lining of existing earthen canals)
- 2) Capacity building (formation of water users associations, capacity building for the operation and maintenance of irrigation facilities, guidance on farming technology, promotion of water-saving irrigation, market analysis for the distribution of agricultural produce)
- 3) Watershed conservation activities (formation of watershed conservation committees, institutional strengthening, surveys of watershed management)
- 4) Consulting services (overall project coordination (review and support for detailed design, construction supervision, monitoring of capacity building and watershed conservation activities))

## **(4) Estimated Project Cost (Loan Amount)**

7,360 million yen (loan amount: 4,406 million yen)

## **(5) Schedule (period of cooperation)**

Planned for the period between the month when the loan agreement is signed (March 2012) and May 2017 (63 months in total). The project will commence in the month when the loan agreement is signed, and will be completed when the facilities start operation (August 2016).

## **(6) Project Implementation Structure**

- 1) Borrower: Republic of Peru
- 2) Guarantor: None
- 3) Executing Agency: Programa de Desarrollo Productivo Agrario Rural: AGRO RURAL
- 4) Operation and Maintenance System:  
Execution of this project will be coordinated by a implementation unit established within AGRO RURAL.

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

- 1) Environmental and Social Consideration  
(1) Category: B

(2) Reason for Categorization

This project is not likely to have significant adverse impact on the environment due to the fact that the project sector and project characteristics are not likely to exert impact and the project is not located in a sensitive area under the “Japan Bank for International Cooperation Guidelines for the Confirmation of Environmental and Social Considerations” (established in April 2002). Thus, the project is classified as Category B.

(3) Environmental Permit

Environmental impact assessment (EIA) reports on individual sub-projects under this project are not required under the domestic laws of Peru.

(4) Anti-Pollution Measures

No particular impact is expected from the use of agrochemicals, fertilizers and the like because the executing agency will provide necessary guidance by way of farming extension workers.

(5) Natural Environment

The target area is not located in or around any sensitive areas, such as national parks, and so any adverse impact on the natural environment is assumed to be minimal.

(6) Social Environment

This project plans to develop facilities on common land shared by the beneficiaries. Agreement has been obtained for using the common land. The project does not involve any resident relocation.

(7) Other/Monitoring

During the project, consultants will monitor construction waste and water quality, etc.

2) Promotion of Poverty Reduction

This project provides direct support to impoverished regions in the areas of agriculture and irrigation. It is expected that poverty will be reduced by increasing land utilization, thereby increasing the income levels of local farmers and revitalizing the local economy.

3) Promotion of Social Development (gender perspective, measures for infectious diseases including HIV/AIDS, participatory development, consideration for persons with disabilities, etc.)

The participation of project beneficiaries will be promoted through the institutional strengthening of water users associations.

**(8) Collaboration with Other Donors**

There is no particular collaboration with other donors. There is, however, a JICA technical cooperation project currently underway, the Project for Improving Livelihood of Small-Scale Farmers in Cajamarca, whose aim is to improve the livelihoods of small-scale farmers in the Sierra region by improving the productivity of cash crops and building agricultural production chains and to build a model that can also be used in the Sierra regions of other departments in the future. Support is being provided while keeping the synergies and impacts of this project in mind.

**(9) Other Important Issues :**

None in particular

**4. Targeted Outcomes**

**(1) Quantitative Effects**

1) Performance Indicators (Operation and Effect Indicator)\*<sup>1</sup>

Indicator	Baseline (Actual value in 2012)	Target (2019) [3 years after project completion* <sup>2</sup> ]
Area of benefit (Ha)	10,522	17,055
Planted acreage according to major crops (Ha)		
- Potatoes	2,923	4,738
- Corn	4,384	7,106
- Kidney beans	779	1,263
- Alfalfa	1,340	2,171
- Peas	1,096	1,777
Yield according to major crops (tons per year)		
- Potatoes	23,382	37,900
- Corn	4,822	7,817
- Kidney beans	857	1,390
- Alfalfa	20,094	32,570
- Peas	1,315	2,132
Unit crop yield according to major crops (tons per Ha)		
- Potatoes	8.00	12.00
- Corn	1.10	1.50
- Kidney beans	1.20	1.40
- Alfalfa	15.00	25.00
- Peas	1.20	2.00
Agricultural earnings per household (nuevo sol per household per year)* <sup>3</sup>	2,821	5,513

\*1 The scope of the performance indicators (operation and effect indicator) shall be the areas covered by this project (37 sub-projects in 9 departments).

\*2 In irrigation projects, given that a project becomes fully effective after going through farming guidance once the facilities have started operation, the target has been set at three years after project completion, rather than the normal two years.

\*3 Method for calculating agricultural earnings per household: ((Annual agricultural yield × Market price) – Production costs) / Number of producing households

2) Internal Rates of Return

Based on the conditions indicated below, the economic internal rate of return (EIRR) of this project will be 16.7%. Given that this project is being implemented as a public project of the Peruvian government, investment costs will not be recovered, and therefore, the financial internal rate of return (FIRR) has not been calculated.

EIRR

Costs: Project cost (excluding taxes), operating and maintenance costs

Benefits: Increase in agricultural production

Project life: 30 years

## **(2) Qualitative Effects**

Poverty reduction through the creation of employment opportunities, improvement in the income level of farmers and revitalization of local economies.

## **5. External Factors and Risk Control**

### **(1) Review and approval of the detailed design, etc.**

AGRO RURAL undertakes the detailed design of civil engineering works, using its own funds to employ local consultants. The consulting services, which are engaged using the ODA loan, review this detailed design based on technical guidelines prepared by AGRO RURAL. So that any matters identified by the review can be properly revised, it should be noted that the contract periods for the local consultants and for the consulting services engaged using the ODA loan will overlap for a necessary period of time.

### **(2) Monitoring of watershed conservation activities**

Watershed conservation activities that include sources of water for irrigation are essential for sustainable irrigation operations, and from the perspective of securing the sustainability of sources of irrigation water, the consulting services engaged using the ODA loan also need to be used for properly monitoring the progress of watershed conservation activities that are funded by the Peruvian government.

## **6. Lessons Learned from Past Projects**

Ex-post evaluations of past irrigation projects point to the importance of: (1) consideration for the operation and maintenance of water users associations; (2) appropriate training for farmers (farming and maintenance, etc.); (3) consideration for the participation of project beneficiaries and the fostering of ownership; and (4) the planning of an appropriate project size, implementation procedure and supervision system based on a careful examination of the capacity of the executing agency to implement the project. In this project, in addition to providing water users associations and farmers with guidance on operation/maintenance and farming, efforts will be made to encourage participation of project beneficiaries and to foster ownership by having farmers take charge of constructing secondary channels and terminal channels. Furthermore, in order to provide adequate project monitoring by the executing agency, preparations will be made soon after the start of the project for the consulting services content and implementation plan and to secure consultants endowed with appropriate experience and qualities.

## **7. Plan for Future Evaluation**

### **(1) Indicators to Be Used**

- 1) Area of benefit (Ha)
- 2) Planted acreage according to major crops (Ha)
- 3) Yield according to major crops (tons per year)
- 4) Unit crop yield according to major crops (tons per Ha)
- 5) Agricultural earnings per household (nuevo sol per household per year)
- 6) EIRR (%)

**(2) Timing**

Three years after project completion