

Internal Ex-Post Evaluation for Grant Aid Project

conducted by Bolivia office: October, 2013

Country Name	Project of Rehabilitation of Irrigation System in Cochabamba
Bolivia	(El Proyecto de Rehabilitación del Sistema de Riego en el Departamento de Cochabamba)

I. Project Outline

Project Cost	E/N Grant Limit: (Phase I) 310 million yen (Phase II) 374 million yen	Contract Amount: (Phase I) 289 million yen (Phase II) 365 million yen
E/N Date	(Phase I) August, 2006, (Phase II) June, 2007	
Completion Date	(Phase I) March, 2008, (Phase II) February, 2009	
Implementing Agency	Prefectural Government of Cochabamba (Prefectura del Departamento de Cochabamba)	
Related Studies	Basic Design Study: November, 2005-July, 2006	
Contracted Agencies	Consultant(s)	(Phase I) Taiyo Consultants Co., Inc. (NTC International Consultants Co., Inc. since July, 2008) (Phase II) NTC International Consultants Co., Inc.
	Contractor(s)	(Phase I and II) Tokura Corporation
	Supplier(s)	-
Related Projects (if any)	<u>Cooperation by Japan</u> • The Project of Vegetable Seeds Production in Cochabamba (Grant Aid, 1987) <u>Cooperation by Other Donors</u> • Sustainable Agriculture Development Program (GTZ/GiZ, 2005-2014)	
Background	In highland and valley regions of Bolivia, the small farmers have been engaged in traditional rain-fed cultivation. Cochabamba is one of the major agricultural areas with irrigation system located even in the valley region under limited annual rainfall. Over 50 years, the irrigation system contributed to agricultural production in Cochabamba. However, the deteriorated irrigation system induced water leakage and lower irrigation efficiency. In addition, the rapid urbanization polluted irrigation water with inflows of untreated sewage. Under this circumstance, the government of Bolivia requested the government of Japan to support rehabilitation of the irrigation system in Cochabamba.	
Project Objectives	Outcome	To increase irrigation water volume and its efficiency as well as to improve quality of irrigation water by rehabilitation of irrigation system in "La Angostura" in Cochabamba.
	Outputs(s)	Japanese Side • Lining of canals of 34.1km • Construction of separate gates, rehabilitation of intake gates of the Central Canal • Mortar waterproofing works of 10,882m ² • Construction of maintenance roads of 20.2km Bolivian Side • Land preparation • Reconnection of illegal sewage to drainage pipes or septic tanks • Construction of drainage for rainwater in urban areas • Control of illegal-dumped waste to the irrigation canals.

II. Result of the Evaluation

Summary of the Evaluation
<p>In Cochabamba, most of the farmers have been engaged in small-scale cultivation of Alfalfa, feed grain, with the average cultivated land of around 1 hectare. However, due to the deterioration of the irrigation system and reduced water efficiency caused by water leakage from the old earth canal, farmers have difficulty of cultivation under the limited annual rainfall of 500mm.</p> <p>This project has partially achieved planned water volume and improved quality of irrigation water. After the project, it is observed double cropping is introduced and the frequency of production per year is increased by using water delivered through the improved canal. The water transportation time is also improved while the expected expansion of irrigation area is not achieved due to urbanization and the diversification of agricultural crop is not realized. As for sustainability, some problems have been observed in terms of the financial aspect and the current status of operation and management due to a lack of financial source to cover the expensive cost for maintenance of the irrigation system. For relevance, the project has been highly relevant with Bolivia's development policy, development needs as well as Japan's ODA policy at the time of both ex-ante and ex-post evaluation. For efficiency, both the project cost and the project period were within the plan.</p> <p>In the light of above, this project is evaluated to be satisfactory.</p>

1 Relevance

This project has been highly relevant with Bolivia's development policy ("access to water for irrigation" in the National

Irrigation Development Plan 2007-2011”), development needs (“irrigation system for agricultural production”), as well as Japan’s ODA policy to support for improvement of productivity at the time of both ex-ante and ex-post evaluation. Therefore, relevance of this project is high.

2 Effectiveness/Impact

This project has somewhat achieved its objectives of increases in volume of irrigation water and improvement of quality of irrigation water while the targeted expansion of irrigation area is not achieved due to urbanization and the diversification of agricultural crop is not realized. The following change with the water delivered through the improved canal is observed while no comparable data on water efficiency through the canal is available since the calculation method on the efficiency at the time of planning is not identified.

For example, the farmers started double cropping by cultivation of “forrajero”, maize for feeding, in addition to cultivation of “choclero”, maize for consumption. Also, the Alfalfa producers became enabled to increase frequency of cultivation a year from 5 to 7 after the project. In addition, the crop loss by drought dramatically reduced after the Project. According to the farmers in the target sites, the drought in 1998 damaged 90% of crops but the drought in 2010 caused only loss of 10% in crops. Moreover, the average of water transport time in the entire irrigation system has been significantly reduced from 10 hours 20 minutes in 2005 to 5 hours 20 minutes in 2012. Furthermore, according to the Water User’s Association of the National Irrigation System No.1 of Angostura (AUSNR No.1: Asociación de Usuarios del Sistema Nacional de Riego No.1 La Angostura), such improvement contributed to the increase in income of the farmers in the target areas (from 667-1,013 to 1,063-2,697 US\$/ha).

The water quality has been improved due to the reduction of discharges of waste water and garbage into the canals after the project. Although illegal dumping remains in some sectors of the canals, source of environmental degradation, such as offensive odor and infections, has been managed through periodical monitoring by the farmers and the technicians of AUSNR No.1:).

The effect by water improvement is observed to some extent while the targeted expansion of irrigation area is not realized; therefore effectiveness/impact of this project is fair.

3 Efficiency

The outputs of the project were produced as planned, and both the project cost and the project period were within the plan (ratio against 96%, 100%). Therefore, efficiency of this project is high.

4 Sustainability

The facilities constructed and rehabilitated by the project have been maintained by AUSNR No.1 under the supervision of the Directorate of Irrigation of the Secretary of Productive Development. AUSNR No.1 is also responsible for control of illegal dumped waste and illegal connection of sewage to the irrigation canals. In addition, the users of the irrigation water, namely the farmers in the project site, have been carrying out cleaning of the irrigation canals according to the plan of water releases. AUSNR No.1 has kept the same structure for O&M of the irrigation system and the sufficient number of staff (8 permanent staff and 6 contract staff) and the technicians of AUSNR No.1 with sufficient experience for O&M of the irrigation system. However, AUSNR No.1 has had financial deficit since 2007 except in 2010. Although water charge has been collected by 100%, the revenue can only cover the O&M cost for the canals but not cover the cost enough for maintenance the Angostura’s dam which should be done every five years. The periodic maintenance of the Angostura’s dam has not been carried out since 2000 though the irrigation system has been mostly functioning well. Overall, the project has some issues in financial aspect and the current status of operation and maintenance. Therefore, sustainability of this project is fair.

III. Recommendations & Lessons Learned

Recommendations for Implementing agency

(For AUSNR)

The AUSNR needs to negotiate with the Prefectural Government of Cochabamba and elaborate mid-term plan for arrangement of major maintenance of the Angostura Dam in order to carry out necessary maintenance.

(For Local Governments)

It is important that the local governments develop integrated plans for solid waste management including improvement of waste disposal as well as environmental education in order to prevent illegal dumping into the irrigation canals.

Lessons learned for JICA

1. It is necessary to make a record of calculation methods on effectiveness indicators; otherwise it is difficult to obtain comparable data.
2. Prevention of illegal dumping is one of the key issues for proper O&M of the irrigation system, in particular, for the canals.



Before the Project



After the Project