

Country Name	<b>Project for Reactivation of “Catarama River Basin Irrigation Project”</b>
Republic of Ecuador	

**I. Project Outline**

Background	Improvement of agricultural productivity was one of the crucial issues in the agricultural sector of Ecuador, and agricultural development was promoted especially in the coastal area. As part of the development, irrigation and drainage facilities were constructed by the “Catarama River Basin Irrigation Project (CRBIP)” (1988-2003) finance by Japan’s ODA loan. However, expected effects, such as the increase in planted areas, were limited due to insufficient utilization of the irrigation facilities and lack of techniques for irrigated agriculture. Another hindering factor was frequent changes in responsible organizations. In order to activate agricultural development activities, the “Support for Planning of Catarama River Basin Irrigation Reactivation Project” (2011) was implemented. And then, the Government of Ecuador requested the Government of Japan to reactivate CRBIP.												
Objectives of the Project	Through operation and maintenance of the irrigation system, dissemination of irrigation agriculture management techniques for farmers, and development of the irrigation area expansion plan, the project aimed at establishing an agricultural promotion structure using an irrigation agricultural model suitable for the target area, thereby contributing to the enhancement of the land use.												
Activities of the project	<ol style="list-style-type: none"> <li>Overall Goal: Land use of target area of CRBIP is enhanced.</li> <li>Project Purpose: Agricultural promotion structure using irrigation agricultural model suitable for the target area is established.</li> </ol>												
Activities of the project	<ol style="list-style-type: none"> <li>Project site: Three areas in the Catarama River Basin in the Province of Los Rios (Sibimbe I, Sibimbe II, and Catarama)</li> <li>Main activities: Development of the Geographic Information System (GIS) database, preparation of the model plan for O&amp;M of irrigation facilities in the secondary canals, training of farmers on O&amp;M of irrigation facilities/irrigation agriculture management, operation of demonstration plots, identification of suitable crops, preparation of strategies for O&amp;M of the irrigation system and development of tertiary canals, etc.</li> <li>Inputs (to carry out above activities) <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Japanese Side</td> <td style="width: 50%;">Ecuadorian Side</td> </tr> <tr> <td>1) Experts from Japan: 9 persons</td> <td>1) Staff allocated: 29 persons</td> </tr> <tr> <td>2) Training in Japan: 9 persons</td> <td>2) Land and facilities: Office space, meeting room, experimental farm, etc.</td> </tr> <tr> <td>3) Equipment: Office equipment, agricultural equipment including sprinklers, GIS software, etc.</td> <td>3) Local cost: Vehicle maintenance, operation of the experimental farm, etc.</td> </tr> <tr> <td>4) Local cost: Car rental, hiring local consultants, etc.</td> <td></td> </tr> </table> </li> </ol>			Japanese Side	Ecuadorian Side	1) Experts from Japan: 9 persons	1) Staff allocated: 29 persons	2) Training in Japan: 9 persons	2) Land and facilities: Office space, meeting room, experimental farm, etc.	3) Equipment: Office equipment, agricultural equipment including sprinklers, GIS software, etc.	3) Local cost: Vehicle maintenance, operation of the experimental farm, etc.	4) Local cost: Car rental, hiring local consultants, etc.	
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Project Period	June 2013 to June 2016	Project Cost	(ex-ante) 409 million yen, (actual) 533million yen										
Implementing Agency	Decentralized Autonomous Provincial Government of Los Rios (GADPLR)												
Cooperation Agency in Japan	Kokusai Kogyo Co., Ltd.												

**II. Result of the Evaluation**

<b>1 Relevance</b>
<p>&lt;Consistency with the Development Policy of Ecuador at the time of Ex-ante Evaluation&gt;</p> <p>The national irrigation plan for 2012 to 2027 focused on utilizing existing irrigation facilities. The provincial development plan of Los Ríos of 2012 aimed at diversification of production and revitalization of agricultural production. Thus, the project was consistent with the development policies of Ecuador at the time of ex-ante evaluation.</p> <p>&lt;Consistency with the Development Needs of Ecuador at the time of Ex-ante Evaluation&gt;</p> <p>Improvement of agricultural productivity was a crucial issue in the agricultural sector of Ecuador. Irrigation and drainage facilities were constructed by the preceding project, but effects were limited due to insufficient utilization of the irrigation facilities and shortage of techniques for irrigated agriculture. The project was consistent with the development needs of Ecuador for further reactivation of the past project effects.</p> <p>&lt;Consistency with Japan’s ODA Policy at the time of Ex-ante Evaluation &gt;</p> <p>In the “Country Assistance Policy for the Republic of Ecuador” (2012), one of the priority areas is “reduction of disparities,” and the related issue is “promotion of community development and development of basic infrastructure.”</p> <p>&lt;Evaluation Result&gt;</p> <p>In light of the above, the relevance of the project is high.</p>
<b>2 Effectiveness/Impact</b>
<p>&lt;Status of Achievement for the Project Purpose at the time of Project Completion&gt;</p> <p>The Project Purpose was achieved by the time of project completion. Based on knowledge and experiences accumulated during the project period, the irrigation agriculture model for small farmers was established (Indicator 1). The model had three elements: i) O&amp;M by GADPLR of major irrigation facilities of the Catarama Irrigation System; ii) Following O&amp;M activities by the farmers in the irrigation blocks such as cleaning of tertiary canals, water distribution to farmers’ plot, water fee payment, and fraud prevention; and iii) request of new tertiary canal construction by farmers’ groups through the irrigation users’ associations to GADPLR. “The Irrigation Area Expansion Plan” (IAEP) was officially approved by the Provincial Council (Indicator 2).</p>

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

The project effects have continued. First, the irrigation agriculture model established by the project has been sustained, through training and seminars for farmers provided by the Department of Irrigation, Drainage and Dredging (DRDD). Training topics have included insect pest management, comparison of rice varieties for the dry season, agricultural administration plan, and others. At the time of ex-post evaluation, training has been under suspension due to the authority change and pandemic of COVID-19. Second, IAEP has been still a part of the Provincial Plan of Irrigation and Drainage (2016-2031). Based on the plan, GADPLR has constructed tertiary canals to increase the irrigation surface and carried out the “O&M Plan” in facilities for primary secondary canals. GADPLR has also invested in the maintenance of the Catarama Pumping Station in 2018. Third, irrigation facilities including the pumping station set by the project have been still functioning.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal has been achieved. The usable irrigation surface has increased to more than 1,800ha (target value) in 2017, 2018 and 2019 in the three schemes of Catarama Irrigation System (Sibimbe I, Sibimbe II, and Catarama), attributed to the training and seminars for farmers conducted by DRDD, constructed tertiary irrigation canals, identified new users, partially updated cadasters of irrigated areas. Another promoting factor was the outreach program implemented jointly by the Technical University of Babahovo and the associations of irrigation users, in which senior students of the Faculty of Agronomy carried out training for farmers in 2017/2018. Training topics included cultivation of rice, corn, and peanuts, crop diversification, pest control, soil analysis, organic fertilizers, institutional strengthening, and so on. Handbooks developed by the project were utilized for the training. The decrease in the irrigation area in 2019 from the previous year was caused by the farmers’ decreased motivation due to the uncertainly regarding market rice prices during the harvest.

<Other Impacts at the time of Ex-post Evaluation>

Some positive impacts have been reported. First, as agricultural activities have been promoted, more women have come to get involved in activities such as soil preparation, fumigation activities, weed control, and harvest, and they have also become active in 12 irrigation Sub-boards of the Catarama Irrigation System. Second, some agricultural companies have organized a trade show of peanuts and corns and invited farmers there for promoting sales, as farmers have grown the crops which were recommended by the project.

On the other hand, there has been no obvious negative impact, but there have been concerns about farmers’ inappropriate handling of agrochemical containers; They have not washed their tools or thrown away containers directly into irrigation or drainage canals. Although the project did not directly incorporate the use of chemical products, the development of agricultural activities has required the use of agrochemicals such as pest control, disease control and weed control. In order to avoid these farmers’ behaviors, GADPLR provided training on “triple lavado (washed three times)” for users of irrigation for safety handling of agriculture inputs. Also, GADPLR signed an agreement with a private company named InnovAgro to implement the program called “Campolimpio” (2015-2020) and built a center for collecting containers of chemical products. At the time of ex-post evaluation, GADPLR was discussing to renew the agreement with InnovAgro.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is high.

Achievement of the Project Purpose and Overall Goal

Aim	Indicators	Results																				
(Project Purpose) Agricultural promotion structure using irrigation agricultural model suitable for the target area is established.	1. A model of irrigation agriculture based on the suitable techniques for agricultural families of small and medium scale of each target area is proposed.	<p><u>Status of achievement: Achieved (Continued).</u> (Project Completion)</p> <ul style="list-style-type: none"> <li>- The irrigation agriculture model for small farmers who owned less than 20ha was established.</li> </ul> <p>(Ex-post Evaluation)</p> <ul style="list-style-type: none"> <li>- The irrigation agriculture model established by the project has been sustained, as training has been provided to farmers based on the model.</li> <li>- Crops recommended by the project have been cultivated, such as corn, rice and peanuts.</li> </ul>																				
	2. IAEP as a policy of GADPLR is adopted.	<p><u>Status of achievement: Achieved (Continued).</u> (Project Completion)</p> <ul style="list-style-type: none"> <li>- The IAEP was approved by the Provincial Council as a part of the Provincial Irrigation and Drainage Plan in May 2016.</li> </ul> <p>(Ex-post Evaluation)</p> <ul style="list-style-type: none"> <li>- IAEP has been still part of the “Provincial Plan of Irrigation and Drainage” (2016-2031), and some projects have been implemented on the plan</li> </ul>																				
(Overall goal) Land use of target area of CRBIP is enhanced.	1. The usable irrigation surface is increased to 1,800ha which equals 40% of the irrigation target area.	<p><u>Status of achievement: Achieved.</u> (Ex-post Evaluation)</p> <ul style="list-style-type: none"> <li>- The total usable irrigation surfaces in the three target areas increased to more than 1,800ha in each of 2017, 2018 and 2020.</li> </ul> <p>Table: Usable irrigation surface (ha)</p> <table border="1"> <thead> <tr> <th></th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Sibimbe 1</td> <td>745.20</td> <td>788.58</td> <td>759.43</td> </tr> <tr> <td>Sibimbe 2</td> <td>630.39</td> <td>698.64</td> <td>583.37</td> </tr> <tr> <td>Catarama</td> <td>529.62</td> <td>585.73</td> <td>530.76</td> </tr> <tr> <td>Total</td> <td>1,905.21</td> <td>2,072.95</td> <td>1,873.56</td> </tr> </tbody> </table>		2017	2018	2019	Sibimbe 1	745.20	788.58	759.43	Sibimbe 2	630.39	698.64	583.37	Catarama	529.62	585.73	530.76	Total	1,905.21	2,072.95	1,873.56
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Source: Project Completion Report and information provided by GADPLR.

3 Efficiency

Although the project period was as planned, the project cost exceeded the plan (ratio against the plan: 100% and 130%, respectively). Outputs were produced as planned. Therefore, the project efficiency is fair.

4 Sustainability

<Policy Aspect>

The Provincial Irrigation and Drainage Plan (PIDP) of Los Ríos (2016-2030) has included policies such as an expansion of the irrigation system coverage, increase in the systemic agricultural productivity, capacity development for the administration, operation and maintenance (O&M) of the irrigation and drainage systems, and so on.

<Institutional/Organizational Aspect>

There has been basically no change in the organizational structure of GADPLR to promote IAEP since the time of project completion. Although the coordination between DRDD and the Department of Productive Development (DDP) had been expected, DDP’s active involvement has kept almost null because a part of its technical staff, who were initially involved in the project, was transferred to DRDD for implementing agricultural management and organizational strengthening activities in the Catarama Irrigation System. The section of GIS has not functioned since 2018, because the technicians in charge have terminated the contract and the license to use the ArcGIS introduced by the project expired. For DRDD, 26 personnel have been assigned and they have been sufficient to carry out functions of O&M in irrigation areas, agricultural and crop management, and organizational strengthening.

<Technical Aspect>

DRDD personnel have sustained skills and knowledge necessary to promote IAEP and support irrigation users regarding the agricultural model. Training opportunities were given to DRDD personnel on integral parcel irrigation, accessories for irrigation systems, pesticides and chemicals management, and so on. Manuals on cultivation techniques of corn, peanut, rice and soybean have been used by DRDD technicians for training for irrigation sub-board members and farmers.

<Financial Aspect>

GADPLR has secured approximately 5.6 million US dollars (USD) for promoting IAEP since 2017. According to GADPLR, these funds have been sufficient. The average annual cost for administration and O&M of the irrigation and drainage system in the Catarama River Basin from 2017 to 2019 was 410.38 thousand USD, and 2,405.38 thousand USD were invested for five construction works of tertiary canals during the same period. User fees have been collected from farmers and they have been used for facility provision, which has complied with their payment.

Table: Revenue of GADPLR for promoting IAEP (Unit: thousand USD)

Source	2017	2018	2019	2020
User fee collection	39.04	43.04	38.63	N.A.
Ministry of Finance	1,975.18	1,975.18	1,975.18	1,975.18
Ecuadorian Development Bank	3,632.30	3,630.61	3,645.90	3,567.80
Total	5,646.52	5,648.83	5,659.71	N.A.

Source: GADPLR

<Evaluation Result>

In the light above, slight problems have been observed in terms of the institutional/organizational aspect of the implementing agency. Therefore, the sustainability of the effects is fair.

5 Summary of the Evaluation

The Project Purpose was achieved, and the project effects have continued. The established model for irrigation agriculture has been sustained as GADPLR and farmers have conducted O&M of the irrigation facilities. The irrigation surface has been expanded as targeted. Regarding sustainability, although further strengthening of the organizations setting, there has been no concern in the technical and financial aspects for promoting IAEP. As for the project efficiency, the project cost exceeded the plan.

Considering all of the above points, this project is evaluated satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing agency:

- It is recommended to GADPLR to take the following actions to make clear impacts of the irrigation and drainage system of Catarama and motivate farmers for further efficient and productive irrigation agriculture: i) to develop a methodology for quantifying production indices such as product prices and crop yields; ii) to show achievements of tertiary canal construction (construction area and number of beneficiaries); and iii) to keep a record of corrective and preventive O&M of irrigation facilities.
- It is recommended to GADPLR to update the license of GIS software and hire a technician to manage GIS equipment provided by the project for irrigation planning management and irrigation facility management.
- The collaboration between DRDD which takes responsibility for IAEP implementation, civil works and O&M of facilities and DDP which oversees agricultural management and organizational strengthening in rural areas is important. It is recommended to GADPLR to reorganize activities and demarcation between DRDD and DDP according to their responsibilities so that DDP would become active again for further enhancement of the land use in the Catarama Irrigation System.

Lessons Learned:

- Since the time of project completion, some agricultural companies have organized a trade show of peanuts and corns and invited farmers there, as farmers have grown the crops which were recommended by the project. If a project introduces new crops with commercial potential, it is desirable to actively involve agricultural companies which deal with agricultural equipment or sell seeds for cultivation of such crops as part of the project, so that farmers could get not only practical information for cultivation but also get some agricultural inputs and/or funds for promoting introduction of these crops during the experimental phase.
- Since the time of project completion, there have been concerns about farmers’ inappropriate handling of agrochemical containers. When providing guidance on agricultural management which includes the cultivation of crops with use of pesticides, it is important to include information on the proper use of pesticide materials in the training.



A male farmer and female farmer working together for manual weeding in peanut crop (Sibimbe II scheme)



Exposure of chemical and organic agricultural inputs in April 2018 (Catarama scheme)