Ex-Post Project Evaluation 2011: Package III-2

(Philippines, Ecuador, Peru)

October 2012

JAPAN INTERNATIONAL COOPERATION AGENCY

GLOBAL GROUP 21 JAPAN, INC.

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Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, third-party evaluations conducted by experts will be enhanced.

This volume shows the results of the ex-post evaluation of ODA Loan projects that were mainly completed in fiscal year 2009, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2008. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

October 2012

Masato Watanabe
Vice President
Japan International Cooperation Agency (JICA)

Disclaimer

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Minor amendments may be made when the contents of this volume is posted on JICA's website.

JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator.

Republic of the Philippines

Ex-Post Evaluation of Japanese ODA Loan Project
"Sustainable environmental conservation project in northern Palawan"

External Evaluator: Wataru Yamamoto
Global Group 21, Japan

0. Summary

This project was implemented for environment conservation and sustainable tourism development purposes, which are in line with the development needs of the Philippines and Palawan Islands. These purposes are also consistent with the country's development policy and Japan's aid policy. From this viewpoint, the relevance of this project is high. This project established a mechanism that enables sustainable utilization of natural resources. This includes; (1) establishing zoning regulation to implement the ECAN Zones created under the ECAN zoning[1] component of the project; (2) provision of alternative livelihoods to the local residents; and (3) prevention of ecosystem degradation in the terrestrial and coastal areas through control of soil erosion from the coastal roads. However, degradation of marine resources may have continued in some areas with inadequate implementation of zoning regulation. The road improvement of the project has contributed to the increase in the number of tourists, which may have indirectly affected the natural environment. Therefore, the effectiveness of this project can be judged to be fair. The project cost and implementation period slightly exceeded the plan; however, the output was also correspondingly more than the plan. Therefore, the efficiency of this project is high. The road section where soil erosion prevention works was carried out has been properly maintained and access among El Nido, Puerto Princesa and other municipalities tremendously improved. However, some local governments do not fully utilize the ECAN zoning and it is based on the seven-years-old satellite data. There is need to strengthen the organizational structure for the implementation of ECAN Zoning in some local government units, and to update the system by providing new satellite image information for the ECAN zoning to be more effective. In addition, there is a need to support the local governments to comply with standards and guidelines for environmentally sustainable tourism development. Therefore, the project sustainability is judged to be fair. In light of the above, this project is evaluated to be satisfactory.

[1] ECAN(Environmentally Critical Areas Network) zoning: demarcation of borders of land use reflecting the local residents' intention based on the geographical conditions, land use, vegetation, ecosystem, to be used to clarify the critical area for environmental conservation and to specify the area as a core zone for priority conservation.

1. Project Description

Project Site


Colon Island

1.1 Background

During 70 years until 1997, about seventy percent (70%) of the Philippine forests was lost. This has caused decline in soil conservation and water resources recharge function resulting in more floods, and droughts. In addition, forty-four percent (44%) of mangrove forest, the habitat of fries, had been lost from 1968 to 1976, which led to the decline of marine resources.

With this background of environmental destruction and natural resources degradation, the Philippine government has been working to reduce the degradation of ecosystems such as unregulated deforestation and damage of coral reefs. The medium-term development plan from 1999 to 2004 recognizes and includes environment conservation as an important task. In addition, in the Tourism Master Plan from 1991 to 2010 where the northern part of Palawan province was its priority area, contribution to the regional economies through tourism development, correction of social disparities and diversification of tourist destinations were raised as main issues. Furthermore, in the Philippines, laws and regulations were established for the conservation of natural resources. However, the implementation was not effective due to insufficient law enforcement capacity caused by financial difficulties of the enforcement agencies, lack of environmental protection consciousness of the local residents, and the livelihood conditions of the residents dependent on the terrestrial and marine resources.

The northern part of Palawan province, the project area, is said to be the last unexplored area of the Philippines, and has coral reefs, tropical rainforest, and the habitat of rare species such as dugong. There are no major industries to support livelihood for the local people. Population growth and poverty has even increased the destructive activities such as fishing using cyanide and dynamite that destroy coral reefs and excessive logging that caused deforestation. In some areas, soil erosion from the coastal roads led to ecosystem deterioration, creating much damage to the marine life.

Strategic Environmental Plan for Palawan Act was enacted for sustainable growth and specific natural resources conservation in Palawan province in 1992, and a guideline was prepared for

comprehensive environmental protection by local governments. ECAN zoning[2], which aims to conserve biodiversity, water resources, and tourism resources; to conduct environmental research; and to respect land use rights of ethnic minorities were the major strategies in the Act. The Palawan Council for Sustainable Development Staff (PCSDS) was promoting and advocating to the municipal governments to adopt ECAN zoning in an ordinance, a local legislation.

ECAN zoning is prepared based on basic information of geographical conditions, land use, vegetation, ecosystems, through consultation with residents. ECAN zoning data needed to be updated through acquisition of new basic data and consultation in order to make the zoning more accurate especially under the rapidly changing environment. It was also needed to establish a plan and system of compliance with ECAN zoning. In addition, it was necessary to provide an alternative means of livelihood[3] and raise awareness of environmental conservation for the residents who depended on agriculture, forestry and fishery in the area where development was restricted.

Under these circumstances, JICA conducted a study of Sustainable Tourism Development Plan in northern Palawan in 1997. This project was proposed with 1) ECAN zoning, 2) prevention of soil erosion in road maintenance, and 3) environmentally sustainable tourism development, which came after the project formation study (1999).

Major cities in Palawan

1.2 Project Outline

The objective of this project is to decrease the negative effects of development and economic activities on the natural environment by 1) supporting the update and implementation of ECAN zoning [4], 2) road rehabilitation to prevent soil erosion (El Nido - Taytay), 3) project management and tourism promotion of environmentally sustainable tourism[5] that can be an alternative livelihood in the northern Palawan, thereby contributing to the sustainable use of natural resources and environment/ecosystem conservation.

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[2] ECAN zoning developed by Palawan Council for Sustainable Development Secretariat (PCSDS) has 'Core zone' (development activities are prohibited), 'Buffer zone' (development activities are limited), 'Multi-purpose zone' (used for other purpose), and 'Tribal Ancestral Lands' (traditional land use by minorities is continued). The ECAN Committee, headed by the mayor, judges whether the request of permission of new buildings suits the ECAN or not, in the local governments.

[3] An alternative of livelihood means an alternative to be provided instead of economic activities that damage natural resources such as illegal fishing.

[4] Support includes: provision of information processing equipment, provision of satellite images in all the eleven local governments in north Palawan, ECAN map preparation through consulting service, preparation of ECAN management guideline, management plan, and training plan, research on ECAN zoning (Participatory coast resource evaluation, coastal sea evaluation, and study on habitation of ecologically important sea area and endangered species), training or ECAN zoning management (community consultation for ECAN map creation, ECAN monitoring, ECAN committee, ECAN management guideline/plan, capacity development plan, etc.).

[5] Preparation of standard and guideline on sustainable tourism development, formulation of the comprehensive tourism promotion plan for respective local governments with the highest priority, and training for work promotion by local residents' tourism business were conducted.

Protected area and a patrol boat of the local government (El Nido)

Fishing boats from outside El Nido area

Loan Approved Amount/ Disbursed Amount	2,034 million Yen／1,956 million Yen
Exchange of Notes Date/ Loan Agreement Signing Date	June 2000 ／ May 2001
Terms and Conditions	0.75% interest rate, 40 years of repayment (10 years grace period) Bilateral Tied (consultant: general tied)
Borrower / Executing Agency	Government of the Philippines / Department of Tourism (DOT), PCSDS, Department of Public Works and Highways (DPWH)
Final Disbursement Date	Sep. 2009
Main Contractor (Over 1 billion yen)	WELEX CONSTRUCTION (Philippine) / GOLDROCK CONSTRUCTION AND DEVELOPMENT CORPORATION(Philippine)
Main Consultant (Over 100 million yen)	ECAN Zoning: PACIFIC CONSULTANTS INTERNATIONAL(Japan)/ ALMEC CORPORATION(Japan)/ DARUMA TECHNOLOGIES INCORPORATED(Philippine)/ CERTEZA SURVEYING AND AEROPHOTO SYSTEMS,INC.(Philippine)/ GEO-SURVEYS & MAPPING,INC.(Philippine) Road rehabilitation: PACIFIC CONSULTANTS INTERNATIONAL(Japan)/ PHILIPP'S TECHNICAL CONSULTANTS CORP(Philippine)/ TCGI ENGINEERS(Philippine)/ FILIPINAS DRAVO CORPORATION(Philippine)/SUSTAINABLE ECOSYSTEMS INTERNATIONAL CORP.(Philippine) Environmentally sustainable tourism development: PCHL CONSULTING GROUP(Ireland)/ CEST INCORPORATED (Philippine)
Related study（F/S, etc.）	Sustainable Tourism Development Plan in North Palawan (JICA 1995-1997), The Sustainable Environmental Management in North Palawan, SAPROF 1999.8-12.

2 Outline of the Evaluation Study

2.1 External Evaluator

Wataru Yamamoto, Global Group Japan 21

2.2 Duration of Evaluation Study

The study period for the ex-post evaluation is as below.

Duration of the Study: October 2011 – July 2012
Duration of the Field Study: November 10– December 1, 2011
February 25– March 3, 2012

2.3 Constraints to the Evaluation Study

This project includes 1) support to update and implementation of ECAN zoning, 2) provision of alternative livelihood and environmental education and raising awareness for the local residents under the ECAN component, and 3) support to the local governments to prepare standards and plans, and 4) training for local residents on tourism business under the component of environmentally sustainable tourism development. There are a wide range of beneficiaries (Table 1). There was limitation to collect information on the respective beneficiaries in the field study period. Therefore, the site inspection was conducted only in El Nido, Taytay, Coron and Puerto Princesa. The beneficiary survey was carried out only for 1) the fishermen around the protected area of Taytay where alternative livelihood improvement activities were promoted by the ECAN component, 2) the tourism business workers in El Nido and Coron where training for tourist business employment was carried out by environmentally sustainable tourism development, and 3) both fishermen and tourism workers in Puerto Princesa. For the local governments, hearing survey and a workshop with implementing agencies, local governments, and NGO representatives was conducted.

Table 1 Beneficiaries and the survey method

Component	Beneficiary	Beneficiary Survey	Workshop and hearing survey
ECAN zoning			
-Support and implementation	Local governments		○
-Provision of alternative livelihood	Residents/Fishermen	○	
Environmentally sustainable tourism development			
-Prepare standards and plans	Local governments		○
-Training	Residents/Fishermen	○	

3 Results of the Evaluation (Overall Rating: B [6])

3.1 Relevance (Rating: ③[7])

3.1.1 Relevance with the Development Plan of the Philippines

As earlier mentioned, the Philippine government recognized environmental conservation as an important issue in the Medium-Term Philippine Development Plan (MTPDP), and the co-existence of the sustainable growth and natural environment resource conservation utilizing ECAN zoning were considered important in Palawan province

In the MTPDP (2004 - 2010), tourism development is recognized to be a powerful promotion source in the Philippine economy, and environmentally sustainable tourism development is considered to be the first priority in national development.

In the Tourism Law enacted in 2009, tourism is regarded as an important sector for investment, employment promotion, and national development, aiming to promote ecologically sustainable and economically viable tourism, having participation of local people with their culture and contributing to equitable distribution in the society. Moreover, the Law aims at making the Philippines the main hub of Asian tourism. It aims to promote tourism that enables conservation of tourism resources based on the culture and history. Thus, the implementation of the project has high consistency with the development policy at the both time of planning and evaluation.

3.1.2 Relevance with the Development Needs of the Philippines

As mentioned in background, at the time of project evaluation, sights of damaged coral reefs abound caused by destructive fishing methods. Excessive deforestation led to soil erosion and ecosystem deterioration. Bad conditions of roads on the coast had created water runoff flowing to the sea causing much damage to marine life. It was imperative to select ecologically important areas, to carry out zoning after due consultations with the stakeholders so that the community accepts the zoning, and programs to protect the area. Although marine conservation activities such as establishing marine protected areas by local governments are seen, development pressure by increasing tourists was getting more serious even at the time of project evaluation[8]. Thus, the necessity to promote environmentally sustainable and socially equitable tourism development was higher. This shows that the compatibility with development needs is high, both at the time of planning and evaluation.

3.1.3 Relevance with Japan's ODA Policy

'Environmental conservation and disaster prevention' has been cited as one of the four priority areas of Country Assistance Program for the Philippines (2000). Consistently, the environmental sector

[6] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[7] ③: High, ② Fair, ① Low

[8] Forest area reduced by 6% (annually 5500ha) during 1992-2005, and coral decreased by 10% during 2004-2011(Palawan province of the Environment, 2009 UPDATE, PCSDS.) Tourists to Palawan increased rapidly in the past several years, and the travel agents by local capital have increased. Tourists to Coron (50,000 people in 2010) have risen eightfold for 4 years after the airport construction in 2008, and that to Puerto Princesa (400,000 in 2010) have doubled in four years.

was the main target for assistance in Overseas Economic Cooperation Operation Policy (1999)[9].

JICA conducted a study on the Northern Palawan Sustainable Tourism Development Plan in 1995-1997, and formulated the Tourism Development Implementation Plan containing the components carried out in this project. Also JICA applied a lower interest rate for environmental projects than the usual rate since 1995 in order to promote implementation of environment and nature conservation projects. Therefore, the compatibility of this project with the aid policy of Japan is high.

From all the above, this project has been highly relevant with the Philippines's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

3.2 Effectiveness[10](Rating: ②)

No operational and effect indicator (quantitative indicator) for this project was specified during the appraisal and the indicators set up for three components were also only for the output level. Therefore, in this ex-post evaluation effectiveness was analyzed mainly by qualitative effect elaborated for each component.

3.2.1 Support to Update ECAN Zoning and Implementation

At the time of appraisal, ECAN maps were planned to be prepared for 11 municipal local governments in Northern Palawan. Training for coastal resources evaluation and investigation of endangered species habitats required for zoning (ECAN zoning management, alternative livelihood program promotion, environmental education, and raising awareness) was planned for five (5) priority municipal local governments[11]. The planned outputs through corresponding programs were realized. Taking all outputs as a whole, the project even exceeded expectations (see the section 3.4.2 Efficiency).

The outputs of this project transformed into outcomes, such as; (1) reorganization of the ECAN committee[12], which supervises adherence to the ECAN zoning, (2) realization of development regulation of core zone, (3) setting of protected areas by the municipal local governments, (4) integration of the zoning in the land use plan through an ordinance, the local government law, (5) enhanced compliance of development regulations by the residents by creation of alternative livelihood, and (6) establishment of community learning centers for effective and continuing development of the

[9] Yen loan policy of the former JBIC

[10] Rating was done adding the 'Impact'. See 3.3.3 for the summary of Efficiency and Impact.

[11] Present land use and various social conditions are taken into consideration through public hearing, and those are reflected in the geographic division of zoning when zoning is going to be formed as an ordinance, although an ECAN map mainly shows the geographic division on the environmental preservation based on natural conditions.

[12] It is the committee which judges whether the building due to be built is observing ECAN zoning or not. The members vary in respective local governments, but they are generally the mayor, the ECAN staff of PCSDS, environment officer, planning officer, the Department of Environment and Natural Resources staff, and the head of the barangay (village), association of the villages, NGOs, etc.. PCSDS checks observance of ECAN zoning based on judgment of the ECAN committee, and issues a building permit (SEP Certificate), responding to the construction request of a new building. This committee existed before the project, but did not work effectively.

alternative livelihood (Figure 1).

Based on the above, the effectiveness of supporting ECAN zoning and its implementation is high.

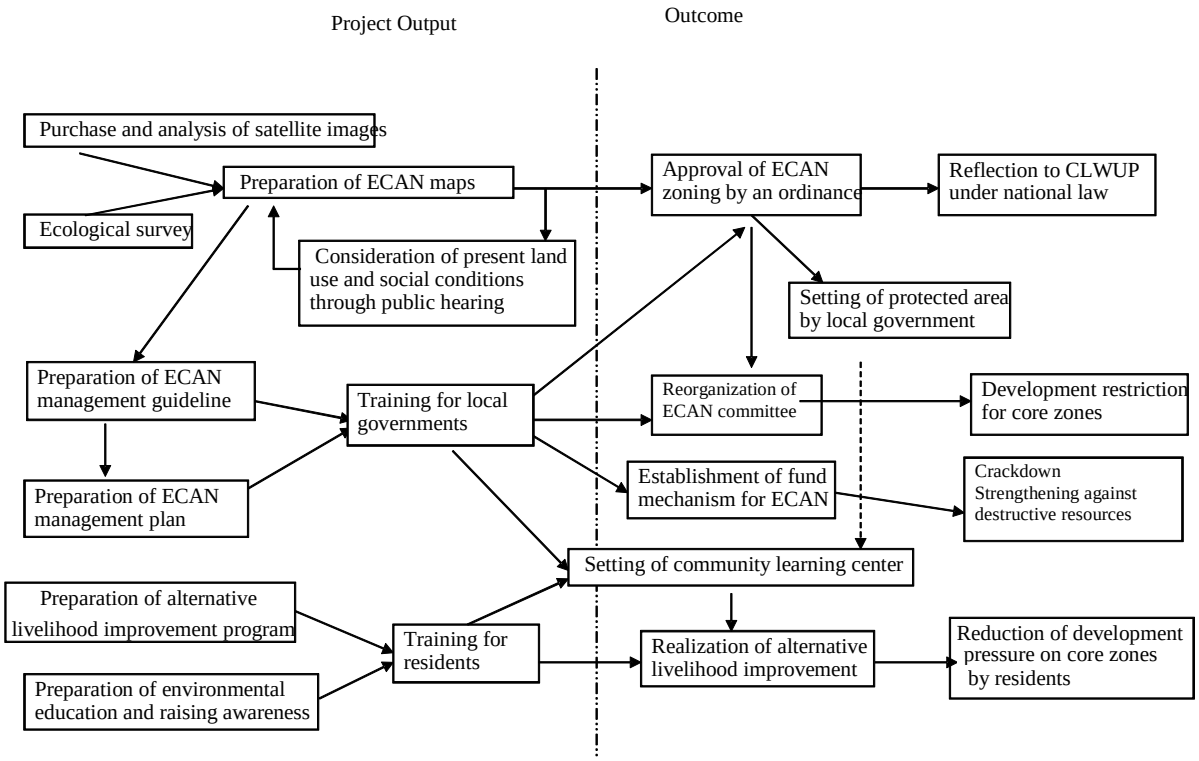


Figure 1 Project output and outcome of the ECAN zoning components

Fishing community (Taytay)

Fishing community (Taytay)

Lake Kayangan with tourists (Coron)

Aqua farming of crabs (Puerto Princesa)

(1) Status of the ECAN Committee

As per established system, the municipal governments adopt the ECAN zoning by an ordinance. The ECAN Committee is reorganized in each municipal local government to implement ECAN Zoning and regulate the protected areas. In this project, ECAN zoning was formulated in eight local governments as a corresponding system that enables sustainable use of natural resources, although only five municipal local governments were included in the plan.

According to PCSDS and municipal local governments, budget is distributed to the ECAN committees in the seven local governments (eight local governments of project implementation except for El Nido). Approval and monitoring of construction are properly carried out by the municipalities. In El Nido, however, the ECAN Zoning is not properly functioning due to the strong pressure of tourism development that caused proliferation of illegal buildings.

(2) Strengthening regulations to reflect the land use planning

Revision of Comprehensive Land and Water Use Plan (CLWUP) has been promoted based on the Local Government Code, the official plan for land and water use plan of the local governments, to strengthen ECAN zoning regulations13.

ECAN zoning has been already reflected in the land use plan of the three local governments. With their CLWUP completed, the four other municipal governments will reflect ECAN zoning in the next land use plan[14]. On the other hand, the integration of ECAN Zoning in the land use plan of El Nido has no progress due to the reluctance of the head of the local government. Discussion among PCSDS, the local government, local NGO are ongoing in El Nido.

3.2.2 Prevention of Soil Erosion

Civil works for erosion prevention was carried out in 59 km, out of the programmed 61.1km of El Nido – Taytay Road. This road section had particularly bad soil conditions with some parts along the coast. Before the project, large amount of soil was flowing directly into the sea when it rains. After

[13] Land use plan, which is based on a national law, can impose more tax and be more compulsory compared with the ECAN zoning, which is only authorized by an ordinance of a local government.

[14] A land use plan is revised by the Local Government Act once in five years. The revision year varies in respective local governments.

the project, the road surface and drainage facilities were improved. Water no longer crosses the road surface, thereby visibly reducing soil erosion as attested by the El Nido local government, the NGOs, and the residents.

Judging from the results of site visits, the work was done properly, and prevention of soil erosion was achieved as planned. However, quantitative data, i.e., the amount of soil that eroded into the sea needed to validate the changes before and after the project could not be obtained.

According to DPWH, the road stretching from Puerto Princesa to El Nido has already been programmed for concreting through national funding. The sections from Puerto Princesa to Roxas have already been concreted. However, the road section covered by this project (El Nido-Taytay) located between Roxas and El Nido is still unpaved but is included in the DPWH program, which is expected to be completed by 2014. With program's completion, soil erosion is expected to decline further.

The above shows the high effectiveness of the soil erosion prevention under this project.

The upgraded bridge (Taytay-El Nido)

Protected slope (Taytay-El Nido)

Figure 3 Improved road section (Taytay-El Nido)

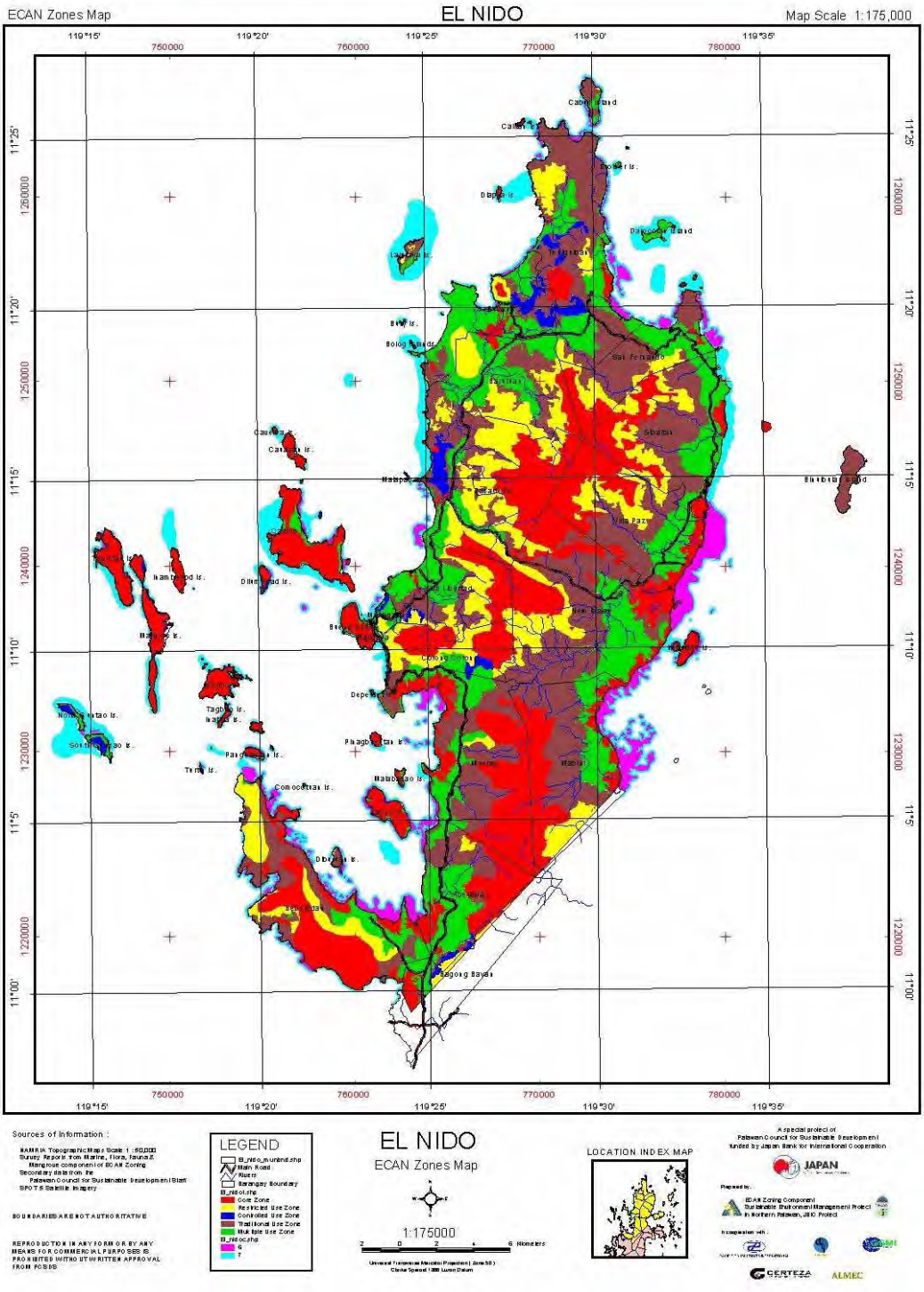


Figure 2 Example of an ECAN zoning map (El Nido)

3.2.3 Environmentally sustainable tourism development

DOT was the implementing agency of this project component. It prepared guidelines and criteria for environmentally sustainable tourism development and Integrated Tourism Development Plan, although these documents are not effectively utilized. The necessary trainings were carried out to promote local residents' participation in tourism and eventually provide alternative livelihood. Thus, the effectiveness of environmentally sustainable tourism development is considered to be fair.[15]

(1) Usage of standards and guidelines on sustainable environmentally sustainable tourism development

Under this project, standards and guidelines for maintaining environmentally sustainable tourism development were prepared for purposes of giving due consideration to environment in tourism development for Northern Palawan. These included construction design guidelines for buildings, sewage management and similar undertaking, standardization of licenses, land use zoning, laws and regulations, organization control, among others.

These standards and guidelines were supposed to be adopted as Municipal Tourism Codes in Coron and El Nido. These were not yet adopted in Coron but already used by the Tourism Office. On the other hand, the El Nido local government did not adopt the standards and guidelines and was never used by the local Tourism Office. Thus, these standard and guidelines are not effectively attaining its purpose, causing problems and eventually, environmental destruction. Municipal governments need stronger support for sustainable tourism development from the DOT but their support is limited since it has no local office in Palawan.

(2) Preparation of comprehensive tourism promotion plan and its implementation

In Busuanga, Coron[16] and El Nido 'Integrated Tourism Development Plan' was prepared by taking into consideration of a fund mechanism for environmentally sustainable tourism. Thirteen (13) tourism development areas and three (3) tours were developed using this plan.

Integrated Tourism Development Plan was prepared based on the above mentioned standards and guidelines, which are important for environmentally sustainable tourism development. The plan was formally approved only by local governments of Busuanga and Coron. In Coron, the plan has been used for development of tourism products by the city Tourism Board. The plan also not been approved formally in El Nido (approved by the city Tourism Boards), neither was it used. As a result, construction of hotels that do not comply with the standards and guidelines are continued, causing environmental degradation, particularly deterioration of water quality. Drainage of hotels along the beach lines of El Nido that discharge to the sea are a common sight. Despite this, the DOT does not support the local government to work for approval and implementation of the comprehensive tourism promotion plans.

[15] The operation effect indices set at the planning time (number of training times and trainees) are output indices, and see '3.4 Efficiency'. Refer to 3.4 as operation effect index at the planning time was an output index.
[16] Busuanga and Coron prepared a combined plan .

(3) Training for local residents' participation in tourism

Beneficiary's survey was conducted for the participants in the tourism livelihood training; 60 tourism business persons, 30 tourism and fishing business persons. The results show that 50 percent started new activities that provided their families additional income. About 33 percent earned monthly income increase of 1,000- 3,000 pesos, 21 percent (21%) earned 3,000-5,000 pesos more and 25 percent (25%) earned a high additional income of 5,000-10,000 pesos. Two respondents in Puerto Princesa revealed that their monthly income increased by more than 15,000 pesos. The average monthly income increase from tourism activities of respondents is 3,300 pesos, in Coron(average of 7 out of 30) and 5,400 pesos (average of 5 out of 24) in El Nido. Clearly, the local people earned additional income from alternative means of livelihood. Depending on resource exploitation such as illegal fishing, some alternative livelihood may lead to the decrease of economic activities. Only 51 percent of the trainees responded that they have changed their consciousness about supporting environment improvement. Respondents showed that training contents in the aspect of environmental education were poor and less effective in terms of improving environmental awareness. These are shown by the less encouraging results of the survey; 47 percent in Taytay where respondents are fishermen and 46 percent and 47 percent in El Nido and Coron, respectively, where respondents are tourism workers. A better result is shown in Puerto Princesa (63%), where respondents are both fishermen and tourism workers. Very few respondents, less than 20 percent said that the trainings helped them improve themselves. This is especially true for the fishermen-respondents of Taytay.

Notice of Coron island

3.3 Impact

3.3.1 Intended Impacts

This project was expected to promote ecosystem conservation and sustainable use of natural resources by reducing the negative impact of development and economic activities on the natural environment. The followings are the relevant impacts of this project:

(1) Promotion of sustainable use and conservation of natural resources through establishment of protected areas

Protected areas were established in both land and marine core areas of ECAN zoning where sustainable use and conservation of natural resources were carried out.

Setting the marine protected area under the ECAN zoning of the project protected spawning areas and secure fish eggs and strengthening of fishing regulations expected to decrease destructive fishing activities. Fishing in the surrounding areas of those places enables to ensure certain level of harvest with protecting fish eggs (sustainable fishing). However, illegal fishing is still a major cause in decrease of fishery resources outside of the protected areas. It was

reported that fishing boats from places outside of Palawan are perpetrating destructive fishing. Hence, the impact of this project is limited to the marine protected areas and vicinity.

In El Nido, open protected areas (about 15 places with 1,100 ha, 30-100 ha/place) are already established based on ECAN zoning. In Taytay where the economy is highly dependent on fishing, regulations were revised. Twenty percent (20%) of municipality income from fishery may be used for marine resources management, especially to strengthen control of illegal fishing. Limited fishing methods are permitted and use of other fishing methods is subject to penalty of not less than 2,500 pesos. About five years ago, an average of three cases of illegal fishing per year was filed. In 2010, no case was filed. The arrested illegal fishing cases was reduced to five in 2009 and three in 2010. The number of fishermen coming to Taytay has decreased over time due to the severe crackdown on illegal fishing in the recent years.

According to Taytay municipal government regulators, with the severe crackdown on illegal fishing, illegal fishermen have also developed methods to avoid being caught. In dynamite fishing, weight is attached to fishing gear to prevent wave on the surface during explosion. Aquaculture is becoming more popular in Palawan. Fish caused by dynamite fishing is used as prey for aquaculture. Dynamite fishing is still common in some isolated islands especially those that are not frequently patrolled. This substantiates the survey result that 70 percent of the fishermen of Taytay consider that fishing resources are decreasing, and the existence of illegal fishing (37%) is still one of the causes.

In the core area of Puerto Princesa, located inland, a community forest is set and the use of non-timber forest products is promoted.

(2) Livelihood improvement through provision of alternative livelihood

In the management guidelines of ECAN zoning, organic farming, aquaculture and processing of cashew nuts, salt, pineapple oil, dry mango, and seaweeds were proposed. Some of these proposals were carried out by fishermen's group and women's group through the funding of local governments and NGOs[17]. Those realized alternative livelihoods contributed to reduce the natural resources destruction by illegal fishing, etc. However, the extent of the effect was not measured.

(3) Continuous activities in community learning center

Community learning centers were established in the seven protected areas in order to provide a link between protection of core areas and livelihood improvement[18]. Support service for

[17] According to PCSDS, about 100 people are involved in cashew processing and handicraft by women's group in El Nido. One hundred farmers participated in seaweed production in Taytay, and one thousand farmers in aquaculture in Taytay with an income increase of 50,000 pesos. Two coconut candy producers with income increase of 2,500 pesos, and two ginger producers are participating. The beneficiary survey for 30 people in Taytay showed that the average monthly income increase is 5,800 pesos (four persons out of 19 persons) by seaweed production.

[18] The community learning center was established as an exit strategy to support ECAN zoning, and is used as a focal point for the alternative livelihood improvement activities by the NGOs and local governments around the designated protected area. This activity is considered to reduce the burden on fishery, and to support to conserve the protected area indirectly.

livelihood improvement activities by the local governments and NGOs, were connected with the protection activities of each zone through residents' organizations of the villages in the community learning center.

(4) Securing funds for environmentally sustainable tourism development

As a means of sustaining the program, fund raising for the development of sustainable tourism by the related organizations and other local governments was proposed under this project. Currently, funds are collected to be used to promote environmentally sustainable tourism. However, the uses of the fund may vary according to the intention of the head of the local government or the indigenous peoples' council. In some instances, management of the fund causes rift among different interest groups. Thus, as it is currently, it is not a stable fund mechanism to support sustainable tourism development for some local governments. Specific examples are cited below:

- The fee of 100 pesos per person is collected in Kayangan Lake, a very popular tourist destination in Coron. It is residence to the indigenous people and a protected area. The indigenous people's council is managing the fund including collection and disposition. There is a disagreement in opinion between the local government and the indigenous people regarding the uses of the fund. Coron island currently accepts the limit of 1000 tourists per day.
- In El Nido, 200 pesos is collected from tourists for staying up to five days. Collection of this fee goes to the Environmental Tourism Development Fund. Approximately 4.3 million pesos was collected in 2010. The breakdown of the fund uses is: 40 percent for strengthening of the protected areas, 20 percent for tourism and waste treatment, 20 percent for operational management, and 10 percent for the local governments' budget.

(5) Impact of soil erosion prevention due to road development

Road improvement of the road section between El Nido and Taytay includes concrete pavement, gravel road, concrete bridges, drainage canals with concrete boxes, drainage canals with concrete pipes and structures, and slope protection. All these contributed to reduction of soil erosion and its inflow into the sea. However, reduction of soil erosion directly connected to reduction of seawater pollution is only found at the road section between the steep drop-off and the seashore, which is just a fraction of the whole road. Therefore, it can be said that the impact is limited to a small area.

3.3.2 Other impacts

According to the NGOs and the local government of El Nido, the construction works to prevent soil erosion between El Nido and Taytay improved road conditions by shortening the required time to go to El Nido to 1.5 hours. Before the project, it took four (4) hours in dry season and eight (8) hours in rainy season to travel from Puerto Princesa to El Nido. Consequently, the number of tourists in El

Nido increased dramatically. The annual number of tourists increased 2.6 times from 14,000 in 2004 to 37,000 in 2010, which is more than the growth in the whole Province of Palawan[19]. As a whole, the number of tourists in Palawan increased by only 53 percent for four years from 2007 to 2010.

According to the results of site visits and interview with PCSDS, the ECAN zoning has not been reflected in the land use planning and the standards and guidelines on environmentally sustainable tourism development have not been formally approved. In the meantime, development of hotels and restaurants to meet the demand of increased number of tourists has been welcomed in El Nido. The construction of hotels and restaurants in a small dense seaside area beyond the capacity of waste water treatment proliferated.

PCSDS is concerned about the loss of tourism resources due to water pollution, accounted to increase in e-coli beyond the standard fit for contact recreation. It is necessary to construct wastewater treatment facility to cover all the area, or to have each hotel establish wastewater treatment facility.

In this project no migration of local people was present since it was only road rehabilitation of existing roads. Moreover, soil erosion to ocean during the construction was pointed out by local residents. However, it was considered to be temporal and the long-term impact on environment was not recognized. According to the people who worked in the construction, in order to place the dug-out soil, land was provided free of change by land owners by giving dug-out soil and land work to prepare the site.

El Nido bay where water pollution is pointed out

Cooperative by a Women group (El Nido)

3.3.3 Summary of effectiveness and impact

In the project, the system that enables sustainable use of natural resources has been built based on the provision of ECAN zoning and an alternative means of livelihood. Protection of natural resources

[19] El Nido can be accessed by road and air. Only a small airplane with 19 persons on board is available by air. Therefore it is speculated that access by road is the main transportation of increased tourists. Road section between Roxas and Taytay was paved by other project, which is also considered to have contributed to the increase of tourists.

was also promoted through controlling erosion along the coastal road. The trainings on tourism and other livelihood implemented in this project brought higher income to the trainees of local residents and are connected to the reduced destructive economic activities like illegal fishing done by some residents. Therefore, it is judged that the effectiveness of the livelihood component is generally high.

Tourists increased rapidly in some municipalities like El Nido while regulation by ECAN zoning did not work effectively. Evidently, marine pollution was caused by increased tourist facilities, which caused degradation of marine resources[20] especially at beach fronts. The number of tourists in El Nido may have increased even if this project was not implemented, but considering that the bad road conditions before the project, road improvement by this project accelerated increase of tourists in El Nido, and indirectly, contributed to the degradation of the natural environment. To strengthen ECAN zoning and to comply with standards and guidelines, it is necessary to help develop capacity of the local governments and raise awareness of the tourism industry workers. Based on the above, the effectiveness/impact of the project is judged to be fair.

3.4 Efficiency (Rating: ③)

3.4.1 Outputs

(1) Support for formulation and implementation of ECAN zoning

The following outputs have been realized through equipment and consulting services procurement. Some are not a part of the plan during the project appraisal. Thus, it suggests that the realized outputs are more than expected.

1) Equipment procurement

Equipment and vehicles for the resource survey and mapping have been procured as planned.

- GIS software,
- Satellite image,
- Coastal marine survey equipment,
- Diving equipment to be used to study mangroves, coral reefs, seaweed, and fish,
- Equipment and vehicles for field survey, and
- Zoning and survey equipment (GPS, etc.)

2) Support for preparation and implementation of ECAN maps

Satellite images have been purchased in all the eleven local governments as planned. ECAN maps were prepared in eight local governments including five priority ones, although it was planned in eleven local governments[21] (Table 2). ECAN maps of the remaining three local governments have been created after the project at the expense of the Philippine Government.

[20] Development is concentrated in a certain area in El Nido, where the bay is narrow and surrounded by mountains.

[21] In Cuyo, Agutaya Magsaysay, only ECAN maps were prepared by the budget of PCSDS after the project (not in this project), due to difficulty and limited access being located in isolated islands.

The ECAN management guideline, the ECAN management plan to show the plan until 2015, the training plan to show training method for the implementation, among others, were prepared to support ECAN zoning implementation.

Although the administrative plan was planned ECAN management guidelines for five priority local governments and the management plan for one local government, these were actually prepared for eight and two local governments, respectively.

Table 2 Support for preparation and implementation of ECAN maps

	ECAN map	ECAN management guideline	ECAN management plan	Training plan
El Nido	○	○	○	
Busuanga	○	○	○	○
Coron	○	○		○
Culion	○	○		○
Tavtav	○	○		
San Vicente	○	○		
Puerto Princesa	○	○		
Linapacan	○	○		

Note: Priority local governments are underlined
Source：PCSDS

3) Research

The following studies were conducted, and the results were reported to the local governments to be used to set the ECAN core zones.

- Participatory study on coastal resource evaluation and coastal ocean evaluation
- Study on habitat of endangered species in terrestrial area
- Study on ecologically important ocean area and habitat of endangered species

4) Training

Under this project, three trainings on ECAN zoning management, alternative livelihood program promotion, and environmental education and raising awareness program were carried out.

Training for ECAN zoning management

After the needs evaluation and preparation three documents, such as; i) Guideline of the community consultation for ECAN map preparation, ii) ECAN monitoring manual and iii) ECAN committee re-formation facilitation manual were prepared. The trainings were conducted in eight local governments, although it was planned only in three (Busuanga, Coron, and Cullion). For the ECAN zoning management, and the ECAN management guidelines, training was also conducted for eight local governments although planned only for five. Training for ECAN

management plan was intended for one local government but was carried out for two local governments. Training plan was prepared and the trainings were carried out in three local governments although these were not included in the plan.

Promotion of alternative livelihood program

The assessment on the alternative livelihood was conducted in four local governments, although it was planned only in three local governments. Organic farming, aquaculture, food processing, and the production of cashew nuts, salt, pineapple, oil, dry mango, seaweeds were proposed.

Environmental education and awareness program

Environmental education manual for teachers were updated by PCSDS, and environmental education for teachers was carried out as planned in three municipalities, with 40 participants in Busuanga, 45 in Coron, 25 in Cullion. In addition, environmental education in elementary and junior high schools were conducted in the entire province.

5) Community Learning Center

As an exit strategy of the ECAN zoning component, Community Learning Centers were established in seven communities (in seven local governments) as a model for protected areas. Livelihood improvement of the local community, which is compatible with nature conservation activities, is promoted in those centers with the local governments and the NGOs. This is an additional output that was not included at the planning period.

(2) Soil erosion prevention works

As per plan, soil erosion prevention works were conducted in the 59 km target road section between El Nido - Taytay. The works included; concrete pavement (6.2 km) , gravel road (53.2 km), concrete bridges (10,301m), drainage canals with concrete boxes (38 units), drainage canals by reinforced concrete pipes (215 pipes), drainage structure, and slope protection etc. It was confirmed by the site visit that the slope protection, road repair, drainage installation, repair and installation of bridges, etc. were accomplished. Compared with the detailed design of the civil works, the quantity of required materials increased to some extent, and accordingly the length of road improvement was slightly shortened.

(3) Project administration and environmentally sustainable tourism promotion

Under this component, there are some outputs that were not in the plan during appraisal, which means that outputs realized were more than expected in the plan.

1) Development of standards and guidelines on environmentally sustainable tourism development

As planned, the draft ordinance was prepared as tourism standards and guidelines on tourism development. This includes construction design guidelines for buildings including sewage management, standardization of licenses, land use zoning, rules and regulations, organization control, etc.

2) Preparation of environmentally sustainable tourism promotion plan

'Development Structure Plan' and 'Piloting of Tourism Product Development' was prepared in Busuanga, Coron and El Nido taking the ECAN zoning and fund mechanism for environmentally sustainable tourism promotion into account. In addition, a feasibility study on sustainable tourism development was conducted in Culion and Taytay, and 'Indicative Structure Development Plan' was prepared in San Vicente.

3) Training to promote residents' participation in tourism

Training on tourism business was conducted for residents of Busuanga, Coron, and El Nido. Some 929 people participated in the training compared to the 160 people expected. The contents of the training modules included; basic sustainable tourism development, Palawan tourism, basic tour guiding, resource evaluation of coral reefs, snorkeling, first aid, reception and guiding techniques, home stay, etc. The contents were mostly vocational training or for livelihood purposes. Thus, the element of environment education was limited.

4) Project formulation study for similar projects

'Sustainable Tourism Management Plan for Central Philippines' was additionally prepared for similar project formation based on the experiences of this project. Again, this was not included in the plan during the appraisal. This was done on the bases of the Philippine government policy that the tourism development of the central Philippines should be the driving force of the region's economy activity.

3.4.2 Project Inputs

3.4.2.1 Project Cost

Actual project cost was 2,820 million Yen, 104% of the planned project cost. Loan disbursement amounted to 1,956 million Yen or 96 percent of the maximum loan amount. The total project cost was slightly higher than the planned project cost due to the corresponding increase in quantity of works particularly for soil erosion prevention works and additional study for the formulation of new projects for the environment conservation type tourism development.

3.4.2.2 Project Period

According to the Project Completion Report, the project period is 79 months from May 2001(signing of the Loan Agreement) to December 2007, which is 119.6 percent of the planned period. The borrowing period was not extended. The project completion is delayed by 18 months compared to the plan mainly due to the following reasons/additional activities:

- Community learning centers were established as an exit strategy of the ECAN zoning component, the centers were used to strengthen protection of the core areas and to support livelihood improvement. These were additional activities.

-The start of the activities was delayed by six months due to the delay in procurement of consultant services. Procurement was done in Fiscal Year 2002 since the budget was not included in Fiscal Year 2001.

- Project formulation study for a similar project was additionally conducted for environmentally sustainable tourism development by using surplus budget.

Table 3 Project cost and loan disbursement（unit: million Yen）

	Planned amount	Actual amount *	Loan	Burden of Philippine Government
ECAN zoning	533	517	516	1
Soil erosion prevention	1,456	1,914	1,199	715
Project management & Environmentally sustainable tourism development	284	389	241	148
Physical contingency	129			
Administrative expenses and tax	267			
Total	2,712	2,820	1,956	864

*: Includes administrative expenses and taxes for each component
Exchange Rates: Weighted average of disbursement amount each year
Source: JICA internal documents

3.4.3 EIRR (Economic Internal Rate of Return)

At the appraisal time, the economic internal rate of return (EIRR) was estimated to be 15.2 percent and 19.1 percent for ECAN component and soil erosion prevention, respectively. Recalculation was not carried out in the ex-post evaluation due to the fact that sufficient data required to recalculate could not be obtained.

From the above, while cost and period for the project is slightly larger than planned, more-than-planned outputs were realized. Therefore, it is judged that the efficiency of the Project is high.

3.5 Sustainability (Rating: ②)

3.5.1 ECAN zoning

(1) Structural Aspects of Operation and Maintenance

PCSDS maintains and manages all the ECAN maps for the whole Palawan province. ECAN committee was re-organized and regulations on development and control on the basis of ECAN zoning were carried out in all the eight local governments, where the maps were prepared. Community learning centers were established in the seven protected areas in order to connect protection of core zones and livelihood improvement. Support service for livelihood improvement activities is carried out by local governments and NGOs with PCSDS' support.

Operation and maintenance system is almost established; however the internal system of human resources to carry out ECAN at some local governments such as El Nido, which does not utilize the ECAN zoning properly is not sufficient.

(2) Technical Aspects of Operation and Maintenance

Technology transfer to PCSDS for ECAN zoning was completed through this project. If satellite images can be purchased, the ECAN zoning can be updated by PCSDS. Each local government has acquired the fundamental knowledge and technology for ECAN zoning management through training under this project.

(3) Financial Aspects of Operation and Maintenance

ECAN zoning was produced on the basis of satellite images from 2001 to 2005, and it needs to be updated about once every ten years. PCSDS' annual budget of 53 million pesos is not sufficient to purchase equipment such as new satellite imagery maps and GIS and perform monitoring, control, and research activities effectively. Around 600-800 million pesos is needed to purchase satellite images of the entire Palawan. PCSDS requested for the budget, but was not approved by the Philippine government in 2011.

(4) Current Status of Operation and Maintenance

During the field works of the evaluator, the ECAN zoning is not fully functional in El Nido. Strengthening of capacity for operation and maintenance with the support of PCSDS is needed.

From the above, some problems have been observed in terms of structural, financial and operation and maintenance aspects of the effect of ECAN zoning.

3.5.2 Soil erosion prevention works

(1) Structural Aspects of Operation and Maintenance

Project Management Office (PMO) of DPWH that implemented the soil erosion prevention works was dissolved after the project completion. Road maintenance is conducted by the sub-regional office of DPWH located in Roxas. No problem was observed in this aspect of operation and maintenance.

(2) Technical Aspects of Operation and Maintenance

Advanced technology is not necessary for the maintenance and management of the road rehabilitated in this project and DPWH already has the technology to maintain them.

(3) Financial Aspects of Operation and Maintenance

According to DPWH, 15 million pesos per year is allocated for operation and maintenance of the El Nido-Taytay Road, which means that there is no financial problem. The roads are being

concreted gradually and are planned to be completed by 2014.

(4) Current Status of Operation and Maintenance

Maintenance works such as surface repair and removal of vegetation around the groove are regularly conducted, thereby maintaining the effectiveness of erosion prevention. As mentioned above, concreting of the target road section is programmed for completion by 2014.

From the above, no problems have been observed in terms of structural, financial and operation and maintenance aspects in the road rehabilitation work.

3.5.3 Environmentally sustainable tourism development

(1) Structural Aspects of Operation and Maintenance

The standards and guidelines for tourism development plan and the comprehensive tourism development plan of local governments were intended to be utilized by the Tourism Board of each local government. For various reasons, the utilization of the documents was not very effective. Among others, (1) the Tourism Boards do not have enough human resources to implement the plans, and (2) the tourism business owners resisted restrictions and regulations on development in some local governments. Moreover, the DOT does not have an office in Palawan to assist the local governments. The local project office of this project was dissolved after project completion. No structural reinforcement or training[22] was extended to the local governments after the project.

(2) Technical Aspects of Operation and Maintenance

Respective local governments have obtained the basic technology to operate the standards and guidelines for tourism development plan and the comprehensive tourism development plan; however, they are not obligated to use them. More training is necessary on appropriate utilization of guidelines, wastewater treatment in hotels or land use zoning.

(3) Financial Aspects of Operation and Maintenance

Fund is collected for ECAN zoning and environmental management by the local government or related organizations based on the comprehensive tourism development plan. However, the possibility of the funds being diverted to other purposes is pointed out. Thus, monitoring is required.

(4) Current Status of Operation and Maintenance

Only few local governments utilize the standards and guidelines for tourism development

[22] Coordination between PCSDS, which has branch offices in some local governments and respective local governments are going well, therefore, it may be good for DOT to conduct follow-up for the local governments with PCSDS.

plan and the comprehensive tourism development plan. The probable reasons may include; lack of consensus building among interest groups to unify differing views on development and environment, and insufficient awareness as among the staff of DOT and some local governments who are suppose to train the contents and promote the compliance of standards and guidelines.

As mentioned above, there are structural, technical and financial problems affecting the effectiveness of the current operation and maintenance of the environmentally sustainable tourism development.

3.5.4 Summary of sustainability

Management of the road maintenance on the section where erosion prevention work is being carried out properly. On the other hand, ECAN zoning is not properly implemented in some local governments. Strengthening the organizational structure in these local governments and updating the satellite image information are needed. Compliance with standards and guidelines that have been prepared in this project and support for local governments (particularly strengthening organizational structure) for approval of the plan are needed in the environmentally sustainable tourism development. Accordingly, the effect of the project on sustainability is judged to be fair.

4. Conclusions, Recommendations and Lessons Learned

4.1 Conclusions

This project was implemented for environment conservation and sustainable tourism development purposes, which are in line with the development needs of the Philippines and Palawan Islands. These purposes are also consistent with the country's development policy and Japan's aid policy. From this viewpoint, the relevance of this project is high. This project established a mechanism that enables sustainable utilization of natural resources. This includes; (1) establishing zoning regulation to implement the ECAN Zones created under the ECAN zoning[23] component of the project; (2) provision of alternative livelihoods to the local residents; and (3) prevention of ecosystem degradation in the terrestrial and coastal areas through control of soil erosion from the coastal roads. However, degradation of marine resources may have continued in some areas with inadequate implementation of zoning regulation. The road improvement of the project has contributed to the increase in the number of tourists, which may have indirectly affected the natural environment. Therefore, the effectiveness of this project can be judged to be fair. The project cost and implementation period slightly exceeded the plan; however, the output was also correspondingly more than the plan. Therefore, the efficiency of this project is high. The road section where soil erosion prevention works was carried out has been properly maintained and access among El Nido, Puerto

[23] ECAN(Environmentally Critical Areas Network) zoning: demarcation of borders of land use reflecting the local residents' intention based on the geographical conditions, land use, vegetation, ecosystem, to be used to clarify the critical area for environmental conservation and to specify the area as a core zone for priority conservation.

Princesa and other municipalities tremendously improved. However, some local governments do not fully utilize the ECAN zoning and it is based on the seven-years-old satellite data. There is need to strengthen the organizational structure for the implementation of ECAN Zoning in some local government units, and to update the system by providing new satellite image information for the ECAN zoning to be more effective. In addition, there is a need to support the local governments to comply with standards and guidelines for environmentally sustainable tourism development. Therefore, the project sustainability is judged to be fair. In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Recommendations to DOT

Strengthening cooperation of ECAN zoning and tourism development at provincial level

The DOT and the PCSDS formed a taskforce to coordinate the smooth implementation of the special law on strategic environmental planning in Palawan Province; however both sides did not share the final output of this project. Technical cooperation was insufficient with respect to tourism development and ECAN zoning. For an effective environmentally sustainable tourism development, it is necessary to strengthen coordination of DOT and PCSDS through information exchange and sharing of output. In addition, the PCSD should open the membership to include the DOT, which is currently not a member of the PCSD.

Support to local governments to implement the standards and guidelines and comprehensive tourism promotion plan

Standards and guidelines for sustainable tourism development planning and comprehensive tourism promotion prepared in this project have not been fully utilized due to lack of awareness and inability of the local governments. In order to utilize the documents, it is recommended that the DOT to leverage those materials for providing technical assistance to local governments.

Introduction of environmental education activities in tourism development training

The training on tourism industry carried out for local residents in this project was a kind of vocational training, as it was meant for the local people to get jobs. It is recommended that trainings for the tourism industry workers include more environmental education elements. For this purpose, trainees should be educated on the fact that to conserve the natural resources and to operate tourism within the carrying capacity of the environment will lead to sustainable tourism in the area where natural resources are also the tourism resources. It is also important to conduct stakeholder analysis to guide the formulation of training contents and methods. Specifically, the difference in awareness among occupational groups (e.g. fishermen and others) should be addressed.

(2) Recommendations to PCSDS

Support on the implementation of ECAN zoning in local governments

It is important that PCSDS continues supporting the local governments, particularly in preparing the management guidelines and management plan for ECAN zoning, which has to be reflected in the land use plans of the eleven municipal local governments in Northern Palawan.

Update of ECAN zoning and spread to other local governments

Current ECAN zoning was created on the basis of satellite images from 2001 to 2005. Currently, the situation has already changed considerably and hence, updating is overdue. It is recommended that new satellite images be acquired to update the ECAN zoning to come up with useful development management and land use plan.

Expansion of monitoring function

The number of tourists increased by 50 percent in 2010, and rapid tourism development is continuing in northern part of Palawan province. If the local people should have continuous benefit from tourism, monitoring of the impact on natural environment, which is the base of the tourism, is necessary. However, sufficient data that can validate the changes in the environment could not be obtained in this ex-post evaluation. It is thus, recommended that PCSDS expand their monitoring function to include monitoring of water quality of river water and seawater to be reflected in sustainable tourism development.

4.2.2 Recommendations to JICA

ECAN zoning has been done through combination of a number of elements such as setting of the core area for biodiversity conservation through the consultation with residents, institutionalization of the conservation, revision of the Fisheries Act, management of sustainable funding mechanism, environmental conservation and the promotion of alternative livelihoods. In the implementation of such project, it is needed to include the strengthening the capacity of local government to regulate development in the project plan.

The ECAN zoning is an environmentally sustainable development strategy based on combination of ecological and socio-economical factors. Such strategies can be applied to other areas in Palawan and other regions in the Philippines. Since a certain amount of know-how in the Philippines has been accumulated in this project, JICA should consider applying this experience to other areas.

4.3 Lessons Learned

Even environmental conservation projects promoting sustainable development can weaken awareness of environmental conservation as communities can be enticed by economic incentives of development. The lack of such awareness can lead to environmental degradation. Therefore, such projects should be led by an organization whose main mandate is environment conservation. In this project, the substantial achievement in ECAN zoning was due to the PCSDS as executing agency. On the other

hand, the tourism development component carried out by DOT did not produce sufficient outcome for environment and in some local governments environmental degradation continued despite the project. The same argument explains the effects of road development by DPWH. From this point of view, the organization that manages environmental conservation could have been the more appropriate lead implementing agency.

Comparison of plan and actual achievement for main components

Item	Plan	Actual achievement
①・ Output	**I. ECAN zoning** a)ECAN mapping (11) b)Research -Participatory coast resource evaluation -Coastal sea evaluation -Study on habitation of ecologically important sea area and endangered species c)Training -ECAN map preparation, monitoring, ECAN committee re-formation(3) -ECAN management guideline (5) -ECAN management plan (1) -Training program in local government(0) -Alternative livelihood improvement (3) -Environment education and enlightening program (3) d)Community learning center (0) **II. Soil erosion prevention works** 61km **III. Environmentally sustainable tourism development** a) Preparation of criteria and guidelines for sustainable tourism development planning b) Environmentally sustainable tourism development (3) c) Training to promote residents' participation in tourism (160 persons) d) Project formulation study for similar projects (none)	**I. ECAN zoning** a)ECAN mapping (8) b)Research Done as planned c)Training -ECAN map preparation, monitoring, ECAN committee re-formation(8) -ECAN management guideline (8) -ECAN management plan (2) -Training program in local government(3) -Alternative livelihood improvement (4) -Environment education and enlightening program (3) d)Community learning center (7) **II. Soil erosion prevention works** 59km **III. Environmentally sustainable tourism development** a) Preparation of criteria and guidelines for sustainable tourism development planning Done as planned b) Environmentally sustainable tourism development (3) c) Training to promote residents' participation in tourism (929 persons) d) Project formulation study for similar projects Sustainable Tourism Management Plan for Central Philippines was completed
②Duration	May 2001～April 2006 （60 months）	May 2001～December 2007 （79 months）
③Project cost Foreign currency Local currency Total (Yen loan) Exchange rate	 1,282 million Yen 1,431 million Yen 2,712 million Yen (2,034 million Yen) 1Peso＝2.8 Yen(June 2000)	 1,956 million Yen 864 million Yen 2,820 million Yen 1,956 million Yen 1Peso＝1.9 Yen(weighted average in June 2002 - June2007)

Remark: A figure in a bracket means the number of local government(s) that falls under the category.

Ecuador

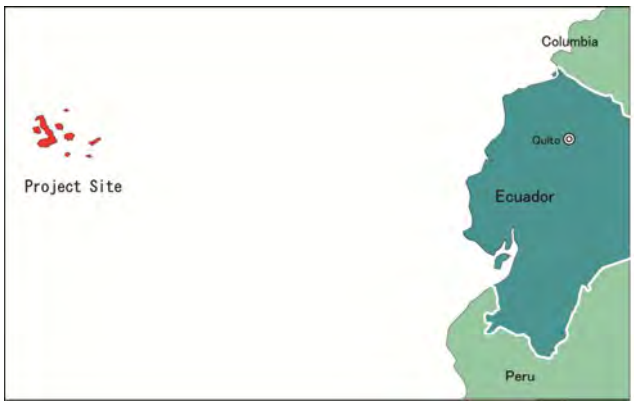
Ex-Post Evaluation of Japanese Technical Cooperation Project
"Project for Conservation of the Galapagos Marine Reserve"

External Evaluator: Wataru Yamamoto
Global Group 21 Japan, Inc.

0. Summary

The Project was implemented for the purpose of strengthening of the management of the Galapagos Marine Reserve (GMR). The project objective is an important policy objective of the Government of Ecuador, highly needed and compatible with Japan's ODA policy. Many of the planned outcomes of the Project, however, do not have a direct link with the Project objective. Since the relationship between the Project objective and some of the planned outputs is questionable, the relevance of the Project is evaluated as fair. On the other hand, most of the outcomes were generally achieved as planned and the activities have mostly continued. As a result, the Project has successfully realised improved awareness among local residents on environmental issues through environmental education, strengthened conservation activities based on the newly-established research and water quality monitoring functions and the promotion of sustainable fisheries through participatory monitoring. Since certain positive effects of new environmental conservation activities by key actors have been confirmed, the effectiveness and impact of the Project are evaluated as high in relation to the prospective achievement of the overall goal. At the initial stage of the Project, many activities stagnated due to the disorganized situation of the counterpart (C/P) organization (implementing agency), worsened relationship with local fishermen and problems surrounding the leasehold of the land earmarked for the construction of the Communication Center for Environmental Education (CCEE). With increased inputs, including the dispatch of more Japanese experts and the recruitment of more local staff, the Project was completed in five years as planned. Based on these facts, the efficiency of the Project is evaluated as fair. Although many activities initiated under the Project are continuing, there is some concern in regard to the function of the Participation Management Board (Junta de Manejo Participativa: JMP) and the financial situation of the implementing agency. Based on above findings, the sustainability of the Project is judged to be fair.
In light of above, this Project is evaluated to be partially satisfactory.

1. Project Description



Location of the Project Site

Communication Center for Environmental Education（CCEE）

1.1 Background

Galapagos Islands

The Galapagos Islands (population of approximately 25,000 as of 2012) of Ecuador are an archipelago of volcanic islands located around the equator in the Pacific Ocean, approximately 1,000 km west of continental Ecuador. Due to the isolation from the continent, a unique local ecosystem was developed. Since the preservation of the local nature and its value for tourism is an important policy agenda, the Government of Ecuador introduced the Special Law[1] in 1997. This was followed by the formulation of a strategic plan for the Galapagos[2] in 2002 aiming at satisfying both the preservation of the biodiversity on the islands, which is truly precious from a global point of view, and the development of local tourism.

As a remote archipelago, the Galapagos Islands traditionally have a unique administrative body called the Participatory Management Boards (JMP)[3] which is

[1] Special Regime Law for the Preservation and Sustainable Development of the Province of Galapagos.

[2] 2010 Strategic Plan for the Conservation and Sustainable Development of the Galapagos. With a target completion year of 2010, this plan consisted of four main pillars: control of the population increase, integrated management of the land area, effective utilization of natural resources while solving the conflict between fishermen and the tourism sector and establishment of an ocean security system.

[3] The JMP is a local mechanism designed to ensure the smooth management of the GMR by dealing with any problems of the GMR while avoiding one-sided decision-making by the central government in view of the remote location of the Galapagos. Its members represent the Galapagos Artisanal Fisheries Sector, Galapagos Chamber of Tourism, Charles Darwin Research Station of the Charles Darwin Foundation (CDF), Naturalist Guides Association and Directorate of the Galapagos National Park (DPNG), representing the five most

designed to avoid the enforcement of one-sided decisions by the central government and to facilitate decision-making through a consensus among local stakeholders. In 2002 the DPNG (Direcíon del Parque Nacional Galápagos) was concerned about the depletion of such fisheries resources as sea cucumber and lobster and decided to ban their fishing. Local fishermen reacted badly to this decision and the resulting confrontation between the DPNG and fishermen impeded efforts to conserve the ecosystem in the GMR. Ecosystem conservation efforts in the coastal Galapagos stayed behind the corresponding efforts inland, presumably because of insufficient basic data on fisheries resources, impacts of waste water discharged by residents to the ocean, weak environmental awareness among fishermen and local residents and poor communication between fishermen and the DPNG.

In January, 2010, a tanker ran aground in a bay on San Cristobal Island and began leaking oil. The JICA dispatched a study team in February, followed by the dispatch of three experts on ecosystem conservation while searching for the possibility of providing long-term cooperation for the protection of natural resources.

Responding to the action by JICA, the Government of Ecuador requested the Government of Japan's implementation of a project designed to strengthen the management of the Galapagos Marine Reserve (GMR). After analyzing the problems by two short field surveys conducted in 2001 and 2002, the JICA implemented a technical cooperation project entitled "the Project for Conservation of the Galapagos Marine Reserve" (hereinafter the Project) for a period of five years from January, 2004 with the DPNG acting as the implementing agency. The Project consisted of wide-ranging activities, including the communication of information to fishing communities, environmental education, oceanic surveys, water quality monitoring and the sustainable management of resources. While accumulating vital information on marine conservation, the Project attempted to strengthen the management system of the GMR through the establishment of alternative means of livelihood for fishermen, improved awareness of marine conservation by local residents and the

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important sectors in the Galapagos (i.e. fishing sector, tourism sector, natural conservation sector, science and education sector and naturalist guides). The JMP was established in 1998 based on the Special Law. The JMP makes its decisions by consensus but these decisions have no legally binding power. When no consensus is reached by members of the JMP, the agenda in question is sent to its superior body, the AIM (Inter-Institutional Management Authority), of which the main members are representatives of the Ministry of Environment, Ministry of Tourism and Ministry of Defense along with some member bodies of the JMP. Decisions by the AIM are based on a majority vote and have legally binding power, forcing all member bodies to abide by such decisions. The revision of the Special Law in 2012 has led to a proposal to revise the members of the JMP to consist of representatives of the islanders of each island, private nature conservation bodies, private tourism sector, health sector and fishermen (further detail in 3.4 – Sustainability).

sustainable management of local resources among fishermen. From the time of the mid-term review of the Project in 2006, the objective of the Project was changed from "promotion of participatory conservation activities for the ecosystem of the GMR" to "strengthening of the participatory management system of the GMR".

1.2 Project Outline

Overall Goal		GMR conservation and sustainable management is promoted through the participation of key actors[4] (changed from the "strengthening of the system for the conservation of the ecosystem of the GMR" at the time of the mid-term evaluation)
Project Objective		Participatory Management System of the GMR is strengthened (changed from the "promotion of participatory conservation activities for the ecosystem of the GMR" at the time of the mid-term evaluation)
Outputs	Output 1	Information flow on marine reserve management is strengthened among fishing communities
	Output 2	Environmental understanding is promoted to the local residents
	Output 3	Information of marine life and ocean environment is increased
	Output 4	Water quality monitoring system is established in Santa Cruz
	Output 5	Sustainable resource management for artisanal fisheries is supported
Inputs		Japanese Side: 1. Experts: 22 personnel in total ● Long-Term (7)、● Short-Term (15) 2. Trainees received (in Japan): 10 personnel 3. Trainees for Third-Country Training Programs: none 4. Equipment supplied: 20 million yen 5. Local cost: 143 million yen 6. Others (incl. dispatch of related missions) Ecuadorian Side: 1. Counterpart(s): 18 personnel in total Project Director, Project Manager and other counterpart personnel (DPNG staff, etc.) (all part-time posts with other

[4] The key actors are organizations, individuals and groups closely linked to the Project. Some examples are schools, fishing cooperatives, municipal office and tourism-related bodies (as defined in the mid-term evaluation).

	regular work of DPNG other than the Project Manager) 2. Procurement of equipment, including vehicle 3. Use of the land owned by the CCEE to accommodate the Project Office and provision of utilities 4. Local cost: counterpart salaries and training cost
Total cost	682 million yen
Period of Cooperation	January, 2004 – January, 2009
Implementing Agency	Dirección del Parque Nacional Galápagos (DPNG), Ministry of the Environment
Cooperation Agency in Japan	None
Related Projects	- Environmental Management Program of Galapagos Islands, IDB, 2001-2005 - Control of Invasive Species in the Galapagos Archipelago, GEF, 2001-2006 - ARAUCALIA Project Integral Galapagos, 1999-2004 - Monitoring of Galapagos Islands, Fundacion Natura/World Bank, -2004.

1.3 Outline of Terminal Evaluation[5]

1.3.1 Achievement of Overall Goal

There has been increasing interest in GMR conservation among not only the five member sectors of the JMP but also other sectors (municipal office, teachers, students and women's groups). As these sectors are expected to grow to become key actors for GMR conservation, at terminal evaluation it was judged that the continuation of the activities initiated under the Project by the implementing agency in the post-project period is likely to achieve the overall goal. Moreover, the relationship between key actors in environmental conservation, such as fishing cooperatives and the DPNG, has been improving, suggesting the likelihood of increased activities based on the proposals of key actors.

1.3.2 Achievement of Project Objective

Although the number of meetings and number of consensus decisions made by the JMP, one indicator of Project objective, decreased in 2007, definite qualitative improvements, including improvement of the consultation process of the JMP were

[5] Terminal evaluation is carried out six months before the termination of project.

found. It was evaluated by Terminal evaluation that the Project objective was being achieved.

1.3.3 Recommendations

The following recommendations were made at the time of the terminal evaluation.

1) Strengthening information dissemination system of DPNG, including the publication of monthly bulletins and television and radio programs on the GMR.
2) Strengthening collaborative relationship of DPNG with secondary schools on a coordinated teaching schedule and collaboration with teachers. Promotion of discussions with the Ministry of Education or its office in the Galapagos in order to integrate project-related activities into the curriculum which is to be developed through the comprehensive reform of education in the future.
3) Increase the number of technicians/engineers to properly implement ocean monitoring. Collaboration between different sections within the DPNG, such as the Marine Resources Administration, is desirable along with collaboration with the CDF and other related organizations.
4) With regard to alternative income sources, development of a scheme to support activities for small and micro-enterprises by means of providing vital information on training credit access and financing, production, commercialization of their products and tax.
5) Preparation and implementation of an operation plan for the CCEE with secured staff and the renewal of exhibitions by the DPNG for environmental education in communities.
6) Securing financial sources of JMP by DPNG and the continuation of the vital functions of the JMP and AIM.

2. Outline of the Evaluation Study

2.1 External Evaluator

Wataru Yamamoto (Global Group 21 Japan, Inc.)

2.2 Duration of Evaluation Study

The ex-post evaluation was conducted over the following period.[6]

[6] Interviews comprising a beneficiary survey were conducted with 48 fishermen based at Puerto Ayora, 30 participants of the environmental education program, 32 ordinary residents and five members of women's groups. In addition, an ex-post evaluation workshop was held to which people from the DPNG, project participants, representatives

Duration of the Study: October, 2011 – July, 2012

Duration of the Field Study: January 15th-28th, 2012 and March 25th -31st, 2012.

2.3 Constraints to the Evaluation Study

As the objective of the Project is considered to be unsuitable to indicate the overall effect of the Project, it is decided that information on the achievement status of the relevant indicators for the project objective are described in this report for reference purposes only. This decision is further supported by the fact that there is a logical gap between the planned outputs and the project objective. Due to the fact, the achievement of each indicator for the project objective was not used in relation to the evaluation of effectiveness and impact of the Project. Instead, the outcome(s), impact(s) and state of activity continuation were analysed for each planned output so that they could be evaluated in an integral manner.

3. Results of the Evaluation (Overall Rating: C[7])

3.1 Relevance (Rating: ②[8])

3.1.1 Relevance with the Development Plan of Ecuador

As already described in the section on the background of the Project, the preservation of the nature and tourism value of the Galapagos was an important policy agenda at the time of the commencement of the Project in 2004. In 1998 a management plan for the GMR was prepared for the nature conservation and sustainable utilization of local resources. Following the adoption of the new constitution in 2008, the Government of Ecuador restated the importance of the preservation of the natural resources and their tourism value of the Galapagos National Park and GMR and began to restrict resettlement from continental Ecuador to the Galapagos. In addition, the Galapagos became a special district managed by a governmental council representing, the Ministry of Environment, Ministry of Planning and Ministry of Tourism, among others, in order to strengthen the conservation system for the area.

Accordingly, the Project was generally relevant to the policy of the Government of Ecuador to promote protection of the nature of the Galapagos at the time of both the ex-ante evaluation and ex-post evaluation.

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of local communities, those working in the education sector and participants of the education program were invited so that the opinions of as many stakeholders as possible could be heard.

[7] A: Highly satisfactory; B: Satisfactory; C: Partially satisfactory; D: Unsatisfactory

[8] ③ High; ② Fair; ① Low

3.1.2 Relevance with the Development Needs of Ecuador

At the time of the planning of the Project, the DPNG introduced restrictions on local fishing activities in the light of the depleting marine resources. As the opposition of fishermen against the restrictions intensified, it was needed to improve the communication with fishermen and the development of alternative income sources if the sustainable management of marine resources was to have any chance of success. Meanwhile, the limited opportunities to provide education on the marine environment for islanders meant that the incentives for them to become serious about environmental conservation required an increased environmental education from the long-term viewpoint. In this sense, the contents of the Japanese assistance for the Project were relevant to the needs of the Galapagos at the time of planning.

The number of tourists visiting the Galapagos has been increasing by approximately 10,000 a year in recent years and the necessity to protect marine environment was even higher at the time of the completion of the Project than at the project planning stage and there is still a consistent need for the sustainable management of the GMR which was aimed at by the Project.

3.1.3 Relevance with Japan's ODA Policy

The Policy Consultation Mission sent to Ecuador in February, 1999 confirmed that the priority areas of Japan's ODA policy for Ecuador were "poverty reduction", "environmental conservation" and "disaster prevention" and the Project falls in the key area of "conservation of the natural environment and ecosystem" of "environmental conservation". The Databook of Japan's Ministry of Foreign Affairs for Ecuador lists environmental conservation as a priority and Japan's Medium-Term Policy for ODA also emphasizes the importance of natural environment sector for cooperation. The Project is, therefore, evaluated as highly relevant to Japan's ODA policy.

3.1.4 Appropriateness of the Project Design

In connection with the Project, the first short-term study (July, 2001), analyzed the existing problems and identified various challenges for environmental conservation efforts in the Galapagos. The second short-term study (March, 2002) proposed a program consisting of several technical cooperation project incorporating wide-ranging activities[9]. It was finally decided that some of the proposed wide-

[9] Program Outputs proposed at the second short-term study :
1: Pilot project to implement a participatory environmental monitoring and feedback program for the RMG to improve the management plan for responsible use of marine tourism sites and ports

ranging activities would be put together to create a project. Because of this historical background, the activities included in the project were diverse with weak linkage between their outputs.

The objective of the Project was set as “strengthening of the participatory management system” (“promotion of conservation of the ecosystem of the GMR through resident participation” prior to the change of the objective). For the actual achievement of this objective, it is necessary to expand the scope of members of the JMP (currently the members of JMP are only representatives from fishery/tourism/science sectors and naturalist and no representative of education sector/civil society is a member). It is also necessary for the opinions of each member of the JMP to properly reflect the opinions of the organization he/she represents. For instance in the component of environmental education, the proper function of such a mechanism demands that the persons who participated in environmental education under the Project need to become a member of the JMP by forming community groups and gradually obtaining political power and support to the extent that members of the JMP may be replaced or expanded. In short, the initiatives by local residents are essential to achieve the objective of the Project.

In reality, many of the outputs of the Project simply consisted of the activities of technology transfer to the DPNG as the C/P organization and were not directly linked to the achievement of the objective of the Project.

Therefore, even though many activities in fields related to environmental conservation were implemented under the Project, the linkage between individual outputs was weak to the extent that these outputs had no direct links with the objective of the Project, suggesting the existence of a gap in logic (so-called theory failure) in the original project design.

Based on the above analysis, although the Project was highly relevant to the development plan and development needs of Ecuador as well as Japan’s ODA policy, the appropriateness of the project design was partly questionable. Consequently, the overall relevance of the Project is evaluated as fair.

2: Implementation of cross-sectoral community communication and feedback system to enhance management and decision making in natural resources and conservation

3: A precautionary resource management and conservation model that takes into account changes in coastal productivity associated with fluctuations in oceanographic factors

4: An income diversification strategy and professionalization program for the fishing family workforce to reduce dependency and fishing pressure on heavily exploited resources

5: An enhanced capacity to monitor and manage impacts of tourism activities at selected marine sites

3.2 Effectiveness and Impact[10] (Rating: ③)

3.2.1 Effectiveness

The implementation of the Project did not achieve the objective of the Project, i.e. strengthening of the participatory management system of the GMR. Due to the weak linkage between the said objective and the outputs, suggesting theory failure regarding the objective, the state of achievement of the project objective is only evaluated as reference data.

As described below, the planned outputs of the Project were generally achieved and the relevant activities have been continuing with some exceptions. The expected outcomes and impacts were observed in many output areas. Of the six planned output areas, four have witnessed the emergence of new environmental conservation activities by key actors, including the introduction of a new section in the DPNG and environmental conservation activities by the municipal office, illustrating the certain positive effects of the Project towards the achievement of the overall goal. Based on these analysis results, the effectiveness and impact of the Project are evaluated as high.

3.2.1.1 Project Outputs

1) Output 1: Information flow on marine reserve management is strengthened among fishing communities

Indicator 1.1	Increase of the knowledge of GMR management of fishing communities by 50%
Indicator 1.2	Increase of the level of internal and external communication involving four fishing cooperatives in the Galapagos and their members by 40%

With the implementation of the Project, information on local fisheries and fishing cooperatives, natural resources of the GMR and progress and results of discussions at the JMP was disseminated to local fishermen in the form of newsletters, radio and television broadcasting and short messages for mobile phones. At the time of the terminal evaluation, the percentage of fishermen feeling that they “always” receive information on GMR management increased by 16.7 points in three years from 31.3% in 2005 to 48% in 2008 (i.e. an increase rate of 53%). Even though

[10] In this report, judgement of the effectiveness is made with additional consideration of the impact.

the level of indicator achievement at the time of project completion was unknown, according to the beneficiary survey conducted as part of the ex-post evaluation, fishermen received information on the GMR from radio programs (42%) and television programs (54%) sponsored by the DPNG and 38% of fishermen said that such information was useful. As information on GMR management was disseminated to local fishing communities by means of a range of DPNG activities (radio and television broadcasting, distribution of newsletters and short messages for mobile phones), the level of knowledge of the GMR and its management is evaluated as having increased.

Based on the above, the Project is evaluated as having achieved Output 1 by the time of the project termination.

2) Output 2: Environmental understanding of local residents is promoted

Indicator 2.1 Number of events on GMR conservation held at the CCEE
Indicator 2.2 Number of participants in conservation activities organized by the CCEE
Indicator 2.3 Level of participation in conservation activities and increase of knowledge of the GMR among the participants of the environmental education program

The Training Center building and Exhibition Center building, both constructed under the Project, were opened in July, 2006 and March, 2008 respectively. In 2007, 55 events were held at the Training Center, ranging from presentations to training sessions, cultural exchanges and meetings of the INGALA (Institute Nacional de Galapagos). In 2008, an average of 3 – 4 events was held every month. This trend continued until the end of the project period. At the time of the ex-post evaluation, the number of events at the CCEE stood at around 3 – 4 times per month.

According to the DPNG, the Training Center was used by some 1,500 people in the first seven months of 2008 (on average 215 people/month) while the Exhibition Center received 4,578 visitors (average of 654 visitors/month) in the same period. Two sets of manuals, one DVD film and two video films have been prepared for environmental education and are constantly shown in the Exhibition Center.

During the project period, four courses with 334 lecture hours were held for secondary school students on the subject of marine conservation with a total of 168

participants (Table 1). The beneficiary survey conducted with those students completing one of the courses revealed that 39% (out of 30 samples) were subsequently involved in activities relating to environmental conservation. This figure is 2.4 times higher than the corresponding figure for local residents in general. Meanwhile, 61% of the students said that their interest in the GMR had increased with 90% having visited the CCEE. Eighty-three percent of those who had visited the CCEE said that the CCEE would be useful for the purpose of environmental conservation.

Based on the above, the CCEE established under the Project is effectively functioning for the dissemination of information on environmental conservation and is evaluated as having improved knowledge and awareness of the GMR on the part of local residents through environmental educational activities featuring secondary school students.

Table 1 Environmental Education Program for Secondary School Students

Course Title	No. of Sessions (times)	Total Lecture Hours (hrs)	No. of Participants (persons)
Training of CCEE Volunteers	3	184	103
Marine Ecosystem of the Galapagos	2	60	30
Learning About the GMR	1	80	25
Diving Techniques at the GMR	1	10	10
Total	7	334	168

Source: JICA

Newly constructed Project Office (currently used as the PNG Office)

Inside the Exhibition Center of the CCEE

3) Output 3: Information of marine life and ocean environment is increased

Indicator 3.1 Increase and diffusion of biological and ecological data on the GMR

Indicator 3.2 Improvement of the research capability of the DPNG

Under the Project, the monitoring of marine life and marine environment newly started along with research on spiny lobster larvae. In this project a total of nine reports, five types of manuals and two DVD films were produced. Since 2005, continual monitoring of the coastal marine environment (measuring the temperature and salt content, etc. at different depths) has been conducted along the coast of Puerto Ayora. There had been a gradual accumulation of data on the local marine environment and a weekly report on such data is published for public access. Research on spiny lobster larvae was conducted from 2005 to 2007. As part of this research, monitoring indices were developed and are still being effectively utilized. The study results for marine life and the marine environment have been actively used for the dissemination of information to fishermen, development of teaching materials on the marine environment and decision-making on the allowed size of the catch of spiny lobster at the JMP.

Based on the above, it is clear that the implementation of the Project has led to the accumulation of important data through regular monitoring, resulting in an increase of information on marine life and the marine environment. Moreover, the continuing monitoring of the marine environment along with the transfer of monitoring techniques has improved the research capability of the DPNG. Accordingly, Output 3 is evaluated as having been achieved.

Marine monitoring by volunteers

Spiny lobster larva specimen room

4) Output 4: Water quality monitoring system is established in Santa Cruz

Indicator 4.1 Regular water quality monitoring
Indicator 4.2 Compilation of water quality monitoring results in an annual report

Under the Project, 11 land sites and nine sea sites near Puerto Ayora were selected in 2005 as monitoring sites and water quality monitoring commenced on 19 items. The frequency of this monitoring subsequently increased to every month and water quality data for both terrestrial and sea water monitoring sites was published in an annual report and on a web page to allow access by local residents. The DPNG included water quality monitoring in its annual operation plan, employed dedicated staff members and established a program in charge of water quality monitoring. The DPNG purchased equipment at its own expense to establish a system which would allow measuring of the water quality at San Cristobal Island as well as Isabela Island, creating an organizational set-up to deal with water environment issues across the Galapagos. Participatory monitoring of the water quality was also conducted as part of the Project.

The monitoring of the water quality has been regularly conducted at the initially planned island of Santa Cruz and has spread to San Cristobal Island and Isabela Island. Based on this, Output 4 is evaluated as having exceeded compared with the level of performance expected in the original plan.

5) Output 5: Sustainable resource management for artisanal fisheries is supported

The activities related to Output 5 consisted of two entirely different sets of activities: support for alternative income sources (Output 5-1) and participatory monitoring (Output 5-2). As such, the evaluation of Output 5 was conducted for these two sub-components.

Output 5-1 Support for alternative income sources is achieved

Indicator 5-1 Increase of the number of fishermen securing an alternative income source(s)

The activities related to Output 5-1 of the Project were (i) promotion of local fishing experience tours for tourists by local fishermen and (ii) support for domestic cottage industries (making of souvenirs and jams) run by women’s groups. In regard

to fishing experience tours, rules were proposed by the project side along with the production of a promotional DVD. In regard to women's groups, seven training sessions were held. For the promotion of fishing experience tours, some 30 fishermen had become capable of leading tours by the end of the project period. However, the task of developing a market for this scheme in order for it to become a viable alternative source of income remained. According to materials provided by the JICA, there appeared to be an ongoing debate on who would organize these fishing experience tours, be it fishermen or the tourism sector, at the time of the Project's end. In the case of support for women's groups, it was confirmed at the time of the terminal evaluation that the Organization for Active Women of Isabela (OMAI) and the Organization of Pinzon Artisan Women of Isabela (OMPAI) were selling T-shirts and other products (a total of 20 – 30 active women in the two groups). While the overall income of these groups had gradually increased, the OMAI in particular appeared to have developed a fairly reliable source of income.

Based on the above, activities designed to develop alternative income sources under the Project had contributed to an increase of an alternative means of livelihood for fishermen, but the scale of the financial contribution was still small. In short, both the positive effects and the subsequent support by the DPNG are evaluated as having been limited.

Output 5-2 Participatory monitoring is implemented

Indicator 5-2 Number of sustainable marine resource management methods proposed by fishermen to the JMP based on the monitoring results

According to materials provided by the JICA, two social survey reports on fishermen were produced along with two reports and one manual (fishing rules featuring the size, age and other aspects of the fish to be caught) on monitoring of the fish catch. As the participatory monitoring of sea cucumbers by local fishermen failed to secure the cooperation of the originally targeted fishermen on Isabela Island, a cash incentive (in a form of daily allowance) was introduced for fishermen on Santa Cruz Island to experiment this activity. Through their participation in the monitoring, local fishermen obtained a better understanding of the state of sea cucumbers. In 2008, these fishermen made a technical proposal to the JMP and a ceiling for the sea cucumber catch was decided with the agreement of fishermen, resulting in lifting of the ban on sea cucumber fishing. According to the DPNG, this lifting of the ban on sea cucumber fishing which was achieved as a result of

participatory monitoring has helped to determine the allocation of the catch for each fishing cooperative. At present, sea cucumber fishing is the livelihood for some 500 fishermen in the Galapagos.

Based on the above, as far as the participatory monitoring of marine resources introduced under the Project is concerned, Output 5-2 is evaluated as having been achieved by the end of the project period in view of the achievement of lifting of the ban of sea cucumber fishing based on proposals made by local fishermen.

A souvenir shop run by a women's group sells local products

Harvest collection point of a local fishing cooperative

3.2.1.2 Achievement of Project Objective

Indicator 1	Number of meetings held by the JMP and number of consensus decisions made by the JMP
Indicator 2[11]	Extent of representation of the opinions of the relevant sectors by members of the JMP
Indicator 3	Number of decisions made by the JMP based on data or reports produced under the Project

As described below, both the number of meetings of the JMP and number of consensus decisions made by the JMP decreased during the project period, suggesting that the mechanism of the JMP was not specifically strengthened. However, as the objective of the Project has only a weak link to the activities and outputs of the Project, the achievement of the above indicators were used only as

[11] This indicator was not used in this evaluation due to the difficulty to figure out the reality.

reference information in this evaluation.

According to the DPNG, the JMP had many meetings and produced many consensus decisions between 2004 and 2006 but the number decreased thereafter (Table 2). The reasons for the decreased number of meetings were that the facilitator left the job in 2008 following the completion of an Inter-American Development Bank (IDB) project[12] in 2007 (the project funding JMP) and that the necessity to verify the compatibility of the JMP with the revised Constitution of Ecuador to the result of a referendum held in November, 2008. As part of the Project, direct support was provided for the management of the JMP in terms of the preparation of the minutes of meetings, publication of bulletins explaining the results of meetings and radio and television reporting as part of the activities under Output 1. The JMP made five consensus decisions on the introduction of fishing experience tours and the sustainable management of sea cucumbers based on data or reports produced under the Project.

Table 2 Number of Meetings of and Number of Consensus Decisions Made by the JMP

Year	Number of Meetings	Number of Consensus Decisions
2004	9	26
2005	11	32
2006	9	17
2007	5	9
2008	8	16
2009	3	11
2010	5	11
2011	5	NA

Source: DPNG

[12] Environmental Management Program of Galapagos Islands, IDB 2001 - 2005

Types of Project Activities and Relation with the Effects

Activities designed to protect nature in development project are generally implemented through a political compromise of various sectors supported by multiple interest groups who may be seeking incompatible ideas of development and environmental conservation. The target areas and persons involved are, therefore, quite diverse. The activities implemented under the Project for conservation of the natural environment may be classified into the following four types.

Type 1: Development of environmental information through efforts to create an information gathering mechanism and to improve communication (Outputs 1, 3 and 4)

Type 2: Environmental education and improvement of awareness for the teaching of new knowledge and fostering of a volunteer spirit (Output 2)

Type 3: Improvement of the existing methods of resources utilization (Output 5-2)

Type 4: Reduction of resources utilization through the use of alternative resources (Output 5-1)

The implementation of these activities is designed to produce the planned outputs. Depending on the actual conditions of each output, the nature of environmental conservation activities (outcomes) is determined.

- In the case of Type 1 activities, the planned output is achieved if the targeted information is gathered, developed or properly disseminated. The effective use of such information may lead to environmental conservation activities (outcomes).

- In the case of Type 2 activities, the planned output is achieved if environmental education is made available for the target persons. Increased environmental knowledge or improved environmental awareness among participants means that the activities are effective. However, improved awareness itself is insufficient to achieve the launch of environmental conservation activities as voluntary commitment based on incentives felt by individual participants is necessary. It is not possible to determine in advance if each participant has such an incentive or not.

- In the case of Type 3 activities, the planned output are achieved when a sustainable method for resources utilization is presented, followed by the relevant training. The effective implementation of such a method produces an outcome(s).

- In the case of Type 4 activities, the planned output is achieved when an alternative source for income increase is realized. In order for this alternative source to have a bearing on environmental conservation, the functioning of the relevant activity to increase income as a viable alternative to the existing unsustainable production activity must be proven. In other words, there is a condition that the level of the environmental load was lowered by the reduced unsustainable utilization of resources. If this condition is not met, the alternative income sources and related activities do not lead to environmental conservation.

3.2.2 Impacts

3.2.2.1 State of Continuity of Outputs

1) Output 1: The flow of information on marine reserve management is strengthened among fishing communities

Although a newsletter has been continuously published since the completion of the Project, publicity solely for the GMR using radio, television and mobile phones has been suspended due to the lack of funds and low level of urgency. The latter is now incorporated into the publicity for the entire national park. According to the results of the beneficiary survey, the relationship between the DPNG and fishing cooperatives is perceived to be very good (2.8%) or good (40%). These figures exceed the combined ratio of 31.3% for a perceived bad relationship (22.8% for bad and 8.5% for very bad). Nearly one quarter of the respondents (22.8%) of the survey consider that the communication between the DPNG and fishing cooperatives is insufficient. Even though the DPNG faces budgetary constraints, it is desirable for it to recommence at least the radio broadcasting program in order to maintain the level of knowledge about the GMR and the reputation of the DPNG among fishermen because of the small cost of such broadcasting.

2) Output 2: The environmental understanding of local residents is promoted

In 2011, the Exhibition Center of the CCEE received 9,010 visitors (5,875 Ecuadorians, 2,335 foreign nationals, 630 Galapagos residents, and unknown 170) while the Research Center was used by 1,661 people. The activities of the CCEE now comprise part of the annual operation plan of the DPNG. One person has been assigned on a part-time basis to the planning of the activities of the CCEE, illustrating the high level of continuity of activities.

The environmental education program for secondary school students has been suspended because of the difficulty for teachers to find time for the program following the revision of the secondary education curriculum by the government. Even though a new curriculum for environmental education is currently being developed, the state of continuity of the activities is not fully satisfactory in terms of environmental education.

3) Output 3: The environmental understanding of local residents is promoted

As part of the reorganization in 2008, the DPGN established the Oceanic Research Division. This division is staffed by two full-time members and five

volunteers and is run on the basis of the annual operation plan of the DPNG. The data published by this division is used to understand the seasonal changes of fishing activities and other purposes. As of 2012, monitoring has an additional four items (sharks, sea turtles, whales and the local ecology). Based on the above, the continuity of the activities is evaluated as being high.

4) Output 4: A water quality monitoring system is established in Santa Cruz

Monitoring has been regularly conducted as planned at Santa Cruz Island and has been expanded to include San Cristobal Island and Isabela Island. The data produced by this continuous monitoring is used at the time of this evaluation for various reports and by the municipal office. However, the participatory water quality monitoring has been terminated since the completion of the Project because of the high cost (US$ 12 per measurement kit) when the available kits were exhausted in 2008.

5) Output 5: Sustainable resource management for artisanal fisheries is supported

At the time of the ex-post evaluation, 25 fishing households run fishing experience tours. However, for this activity to become a viable alternative income source, it is essential for it to be certified as a tourism activity[13] along with development of the market. Although fishermen have proposed a revision of the rules governing fishing experience tours to the JMP, no decisions have yet been made. What is required is the clear establishment of the status of fishing experience tours as a business by local fishermen.

In the case of support for domestic cottage industries run by women's groups, one group, the OMPAI, has ceased their activities due to financial difficulties and a change of the leader. While the other group, the OMAI, run by 12 women (six engaged in the production of such souvenirs as T-shirts and stuffed toys and six in the production of jam) has earnings from the sale of souvenirs, the limited market means that their income is far smaller (3 – 5%) than the earnings of their husbands from fisheries. Moreover, the DPNG does not currently provide support for women's groups.

In regard to participatory monitoring, the beneficiary survey at the time of the ex-post evaluation found that 34% of fishermen were involved in this activity. The fact that the ban on sea cucumber fishing has been listed on a sustainable basis with the cooperation of fishermen indicates the high level of continuity of

[13] Unless certification by the Tourist Board in the form of an OK Certificate is obtained, fishing experience tours cannot be incorporated in tours for tourists.

this activity.

Table 3 Summary Table of the Outcomes/Impacts and State of Continuation of Activities by Output[14]

	Level of Achievement[15]	Situation of Achievement
Output 1		Information flow on marine reserve management is strengthened among fishing communities
Output	High	Information on the GMR is disseminated by means of radio and television broadcasting, newsletters and messages to mobile phones.
Outcome /Impact	Medium	Knowledge of GMR management in fishing communities has improved. Communication using mobile phones to fishermen has started by fishing cooperatives.
State of Continuance of Activities	Medium	Radio and television broadcasting on the GMR is now included in programmes featuring the entire national park (the programs solely about the GMR has ceased except for newsletters).
Output 2		Environmental understanding is promoted to the local residents
Output	High	• The CCEE was constructed and opened in March, 2008. • The facilities of the CCEE are frequently used for environmental conservation activities and events. • Educational programs for secondary school students have been held (seven courses, 334 hours and 168 students so far).
Outcome /Impact	High	• Understanding of the environment has been promoted among secondary school students and ordinary residents. • As of 2012, some 10,000 people a year visit the CCEE. • The facilities of the CCEE are used for environmental education activities and events with a finalized schedule up to August, 2012.
State of Continuance of Activities	Medium	• The CCEE is an integral part of the annual operation plan of the DPNG. • Environmental education for secondary school students has been suspended as a new curriculum is currently being developed.
Output 3		Information of marine life and ocean environment is increased
Output	High	Studies on the coastal sea environment and spiny lobster larvae had been conducted and useful data has been accumulated.
Outcome/ Impact	High	• As the DPNG has established the Oceanic Research Division, its research function has improved. • The JMP continually uses the data on spiny lobster larvae for any decision on the allowable catch. • Research work on the coastal sea water quality is continuing.
State of Continuance of Activities	High	• The monitoring items have been expanded to include sea turtles, sharks and marine ecology. • The Oceanic Research Division is run by two full-time staff members

[14] Output: the effect of project demonstrated at the termination of project, outcome/impact and State of continuance: the effect/activities at the ex-post evaluation.

[15] Level of achievement: High >80%, Medium 50-80%, Low <50%.

		and volunteers and its activities are included in the annual operation plan of the DPNG.
Output 4		Water quality monitoring system is established in Santa Cruz
Output	High	• Water monitoring has been conducted for 19 parameters at 11 terrestrial sites and nine sites in the sea near Puerto Ayora. • Participatory water quality monitoring has been conducted for the purpose of increasing the awareness of the marine environment on the part of local residents.
Outcome/ Impact	High	• The monitoring results can be accessed by anyone on the Internet. • The municipal office has changed the water source and tightened the control of contamination sources in response to a reported deterioration of the water quality.
State of Continuance of Activities	High	• The DPNG has purchased equipment at its own expense for installation by the Water Quality Monitoring Program. The scope of monitoring has been expanded to San Cristobal Island and Isabela Island. Monitoring now corresponds to the need to identify contamination sources.
Output 5		Sustainable resource management for artisanal fisheries is supported
Output 5－1		**Development of alternative means of livelihood**
Output	High	Support has been provided for the activities of women's groups to make souvenirs and jam and also for local fishing experience tours organized by fishermen for tourists.
Outcome/ Impact	Medium	• The commercial operations of women's groups have encountered marketing problems and their impact is limited. • Fishing experience tours face a problem of coordination with the tourism sector.
State of Continuance of Activities	Medium	The DPNG does not support the commercial activities of women's groups or the local fishing experience tours organized by fishermen.
Output 5－2		**Monitoring of marine resources with the participation of fishermen**
Output	High	The monitoring of sea cucumbers has been conducted with the participation of fishermen.
Outcome/ Impact	High	The JMP's decision on the allowable catch each year is made based on data obtained by participatory monitoring and with the consent of fishermen.
State of Continuance of Activities	High	Participatory monitoring is continuing as part of the annual operation plan of the DPNG.

3.2.2.2 Achievement of the Overall Goal

The overall goal of the Project was the successful promotion of the conservation and sustainable management of the GMR through the participation of key actors (Indicator: number of conservation activities based on proposals by key actors).

The key actors in the Galapagos are thought to include members of the JMP (representatives of the DPNG, Chamber of Tourism, Galapagos Artisanal Fisheries Sector and Naturalist Guides Association), schools, fishing cooperatives and the municipal office. It has been confirmed that the nine conservation activities listed below were implemented in related to the planned outputs of the Project. Based on the above, although the number of key actors has not increased, the overall goal is evaluated as having been achieved due to the major contribution of the project outputs to the activities to protect nature of the key actors.

(1) Fisheries Sector (Related to Outputs 1 and 5)

- Following the dissemination of information on the GMR on Isabela Island and San Cristobal Island under the Project through the mobile phone network, the use of mobile phones for information exchange in and between fishing cooperatives has started.
- The annual amount of the allowable catch is now determined based on data provided by participatory monitoring.

(2) Municipal Office (Related to Output 4)

In the face of a problem of water quality deterioration in the Galapagos as revealed by the water quality monitoring under the Project, the municipal office took the following actions in 2011.

- The source for municipal water supply was moved 3 km from a fracture in the rock near the bay of Puerto Ayora to a site on a hill.
- The boat maintenance site was moved to a site on a hill to improve the water quality in the Bay of Puerto Ayora.
- The refueling point for boats was moved from inside the Bay of Puerto Ayora to outside the Bay.
- Recycling of the spent engine oil of boats is planned.

(3) DPNG (related to Outputs 2, 3 and 4)

- The CCEE facilities are used for environmental education activities (some 9,000 visitors/year to the Exhibition Center, approximately three environment-related events/month, environmental education for new residents by the government, environment-related seminars and others).
- The Ocean Research Division has been established to start the monitoring of not only sea cucumbers and spiny lobster larvae but also sharks, sea turtles and marine ecology. Useful data has been accumulated and is used for activities to

protect nature.

- A water quality monitoring program has been established to conduct water quality inspection as required. One such inspection aimed at investing the cause of the mass death of fish near San Cristobal Island has been conducted.

3.2.2.3 Summary of Effectiveness and Impact

As mentioned above, the outputs of the project were achieved as planed with some exception, and these activities are continued. As results, expected outcomes and impacts were observed in the many activities. Regarding overall goal, new environmental activities by key actors (e.g. establishment of new divisions, environmental protection activities by municipalities) were confirmed in four out of six outputs and impacts were emerged at a certain level. Based on the above, effectiveness and impact of the project were judged as high.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

3.3.1.1 Elements of Inputs

Based on materials provided by the JICA and the results of interviews with those involved in the Project, the following problems can be pointed out in relation to the inputs.

- In the first half of the project period, the project implementation system of the DPNG was unstable, restricting the inputs by C/P personnel and the scope of activities. In 2004, 5–6 strikes were carried out by local fishermen regarding restrictions imposed on sea cucumber fishing and the DPNG could not properly function because of the situation. Moreover, the implementation of the Project was significantly affected by the frequent replacement of the Director General of the DPNG, strike action by DPNG staff members over a reduction of their salaries and change of the head of the Marine Resources Administration. Even though the staff strength of the patrol section was increased, no such increase was made for the Marine Resources Administration which was the counterpart section for the Project. In 2004 when the confusion at the DPNG was at its highest level, Japanese experts were dispatched at a rate of some 50 person-months. This was almost equivalent to one-quarter of the total person-months figure and approximately one-third of the budget for the dispatch of experts was spent in this period. This means that many experts were dispatched in a period in which they could not work efficiently.

- Under the circumstances described above, the scope of the marine survey was considerably reduced because of the practical impossibility to procure expensive survey equipment (digital aerial camera). Instead, the emphasis was placed on activities involving organizations other than the DPNG (for example, the municipal office and schools).

Element of Input	Planned	Actual (At the Time of Completion)
(1) Dispatch of Experts	4 long-term experts (at the time of the initial discussions on the Project in 2003) • Chief advisor (GMR management) • Project coordinator • Marine ecosystem monitoring • Environmental education and community activities 2 or 3 short-term experts	7 long-term experts • Chief advisor (GMR management) • Project coordinator • Marine ecosystem monitoring • Environmental education and community activities • Environmental ecosystem monitoring 15 short-term experts • Supervision of facility construction (2) • Completion inspection of new facilities • Environmental education • Support for capacity building of fishermen • Marine ecosystem monitoring • Marine resources monitoring • Project management (2) • Other fields Total dispatch month 213.6 (2003(13.5) 2004(49.5) 2005(39.5) 2006(46) 2007(36.6), 2008(28.5) Cost of dispatch 390,392 thousand yen
(2) Trainees Received		10 trainees in such fields as conservation of the ecosystem, monitoring of water contamination and ocean pollution, environmental education and others
(3) Third-Country Training Program	None	None
(4) Equipment Cost	217 million yen to cover the costs of survey, training, AV, communication and other equipment required for the Project (of which 200 million yen is for a digital aerial camera)	27 million yen to cover the costs of marine surveying, water quality analysis, communication and other equipment required for the Project plus a vehicle for the survey team
(5) Construction Cost	Construction of the CCEE building:5 0 million yen	Construction of the CCEE building

Total Cost of Japanese Assistance	500 million yen	682 million yen
Inputs by the Government of Ecuador	• Project director • Project manager • Counterpart personnel (DPNG staff members) • Secretary, clerk and driver < Equipment and vehicle > • Land, buildings and other facilities, including an office for the Japanese experts • Local cost (as required by project-related activities)	Counterpart personnel (18 in total) • Project director • Project manager • Counterpart personnel (DPNG staff members) • Others (All but the project manager worked on a part-time basis.) < Equipment and vehicle > • Land for the CCEE (The annual budget of the CCEE at the time of the mid-term evaluation was approximately 9 million yen.)

As most of the counterpart personnel assigned to the Project worked on a part-time basis, it was extremely difficult for them to get fully involved in the Project because of their other assignments. This situation forced the recruitment of local staff to work exclusively for the Project. Although the direct employment of highly professional staff contributed to the smooth implementation of the Project, the overall project cost increased accordingly.

Because of the lengthy period of negotiations for the use of land earmarked for the construction of the CCEE under the Project, the actual opening of the CCEE was delayed by more than one year.[16]

3.3.1.2 Project Cost

The total cost of the Japanese assistance for the Project was 682 million yen which exceeded the originally planned amount (ratio to planned amount: 136%). The reason for this is that the increased funding necessitated by the increase of the number of dispatched experts and recruitment of local staff exceeded the decreased amount of the equipment cost due to the withdrawal of marine survey equipment.

[16] In response to a request made by the DPNG, the construction site for the CCEE was changed to a more convenient place for its use by local communities. However, the land in question was jointly owned by the DPNG and the INGALA (Galapagos National Institute) and was on lease to a private organization at the time. As both government bodies insisted on their right of use, it was impossible to proceed with the plan. An agreement was finally reached between the two organizations for the use of the land by the DPNG when the mid-term evaluation team visited the Galapagos in July, 2006. Because of this, the use of the CCEE during the project period was limited but its construction in a convenient place has led to the effective use of its facilities at the time of the ex-post evaluation.

3.3.1.3 Period of Cooperation

Japan's cooperation period for the Project was five years as planned. The delay caused by confusion in the early stages of the Project was compensated by the faster implementation of the Project due to modification of the activities, increase of the number of experts and recruitment of local staff. Consequently, the Project-related activities were completed within the planned cooperation period.

Based on the above, even though the cooperation period to produce the planned outputs was within the originally planned period, the total amount of the project cost exceeded the planned amount due to the fact that the timing of the inputs was inappropriate. Therefore, the efficiency of the Project is evaluated to be fair.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy towards the Project

The Government of Ecuador is increasingly emphasizing the protection of nature at the GMR of the Galapagos National Park. One example of such emphasis is the establishment of the Galapagos as a Special District instead of a province. At the same time, a Government Council has been established to strengthen the governance in order to preserve the value of the Galapagos as a natural asset and to ensure development based on the principle of environmental conservation. One of the measures introduced is the restriction of new settlers. In 2011, a proposal was made to revise the Special Law to change the composition of the JMP to include representatives of citizens, the health sector and other stakeholders. As the efforts of the Government of Ecuador to protect the GMR are expected to continue, the sustainability of the Project within the policy and institutional framework is expected to be generally secure.

3.4.2 Institutional and Operational Aspects of the Implementing Agency

In August, 2008, 150 people contracted to the DPNG became full-time employees, stabilizing the state of personnel deployment of the DPNG. Following its restructuring in 2012, the staff strength of the DPNG is currently approximately 150. While the Director General of the DPNG used to be an appointee of the Ministry of Environment, the position became subject to open recruitment in 2007 in response to a proposal made by the UNDP, eliminating the possibility of frequent changes as witnessed in the early stages of the Project. The organizational structure of the DPNG has become much more stable compared to the time of the Project's commencement. The DPNG is currently undertaking major organizational reform to

improve its efficiency. As part of this, 51 positions have been dismissed in January 2012 and two counterparts have left the DPNG. The remaining five counterparts continue to hold the same positions as before.

The JMP, the body specifically targeted by the objective of the Project, is supposed to be run by a facilitator who is employed using the budget of the DPNG. According to a DPNG source, however, while the budget of the JMP was assisted by the IDB until 2005[17], the subsequent withdrawal of funding by the IDB has led to fewer activities on the part of the JMP. In recent years, the JMP appears to have become a body simply to discuss matters relating to fisheries. In 2012, the DPNG allocated US$ 20,000 for the JMP to employ a facilitator to activate the JMP although the employment contract of this facilitator will expire in October, 2012. It is necessary to pay close attention to the role to be played by the facilitator, to the possible revision of members and to other aspects of the JMP. As mentioned in 3.4.1, the members of the JMP are expected to be modified after the enforcement of the revised Special Law.

In short, while the organizational set-up of the DPNG has been improving, there is concern in regard to the institutional aspect of the DPNG because of the need to continually monitor the composition of the JMP and the employment of the facilitator.

3.4.3 Technical Aspects of the Implementing Agency

Based on the technical standards required to achieve the intended outputs and the state of continuity of activities in the post-project period, the Project is judged to have conducted the transfer of technology in an appropriate manner in general. However, no counterparts were deployed for the establishment of alternative income sources (part of Output 5) and this activity was mostly led by locally recruited staff for the Project. As such, no sufficient transfer of technology to the counterparts took place. At the time of the ex-post evaluation, the DPNG was not providing support for this activity. The reason for this is presumably the passive attitude of the DPNG towards continually supporting the small groups rather than a reflection of its technical capability.

3.4.4 Financial Aspects of the Implementing Agency

Fifty-three percent of the funding for the DPNG comes from the distribution of the entry tax to the Galapagos paid by visitors. Because of the increasing number of tourists, the financial base of the DPNG appears to be stable. Because of the

[17] Environmental Management Program of Galapagos Islands, IDB 2001 - 2005

tendency of the DPNG to employ excess personnel, its budget does not necessarily have any surplus.[18] While an adequate budget can be allocated to priority activities, the budget size for non-priority activities may not be sufficient. For example, while the scope of such activities as water quality monitoring and marine research has been expanding with the recruitment of specialists, radio and television broadcasting focusing solely on the GMR and other activities has been terminated due to budgetary constraints. In short, the financial aspect of the DPNG as an organization does not pose any problems. There is slight concern in regard to the sustainability of the project effects, however, because continued budget allocation to support many activities launched under the Project depends on the perceived priority or non-priority status of each activity by the DPNG.

Based on the above, the sustainability of the effects of the Project is evaluated as fair because of some problems relating to the institutional and financial aspects of the DPNG.

4. Conclusions, Lessons Learned and Recommendations

4.1 Conclusions

Strengthening of the management of the Galapagos Marine Reserve (GMR), which was the objective of the Project, is an important policy objective of the Government of Ecuador, is highly necessary and compatible with Japan's ODA policy. Many of the planned outcomes of the Project, however, do not have a direct link with the Project objective. Given the fact that the relationship between the Project objective and some of the planned outputs is questionable, the relevance of the Project is evaluated as fair. On the other hand, most of the outcomes were generally achieved as planned and the activities have mostly continued. As a result, the Project has successfully realised improved awareness among local residents on environmental issues through environmental education, strengthened conservation activities based on the newly-established research and water quality monitoring functions and the promotion of sustainable fisheries through participatory monitoring. Since certain positive effects of new environmental conservation activities by key actors have been confirmed, the effectiveness and impact of the Project are evaluated as high in relation to the prospective achievement of the overall goal. At the initial stage of the Project, many activities stagnated due to the disorganized situation of

[18] In Ecuador for every new national administration tend to add extra personnel. The DPNG has been securing its budget to maintain its activities by shedding staff members every few years. The latest round of such downsizing took place in January, 2012 when 50 employees out of some 200 were made redundant.

the counterpart (C/P) organization (implementing agency), worsened relationship with local fishermen and problems surrounding the leasehold of the land earmarked for the construction of the Communication Center for Environmental Education (CCEE). With increased inputs, including the dispatch of more Japanese experts and the recruitment of more local staff, the Project was completed in five years as planned. Based on these facts, the efficiency of the Project is evaluated as fair. Although many activities initiated under the Project are continuing, there is some concern in regard to the function of the Participation Management Board (Junta de Manejo Participativa: JMP) and the financial situation of the implementing agency. In this sense, the sustainability of the Project is judged to be fair.
In light of the above, this Project is evaluated to be partially satisfactory.

4.2 Recommendations

4.2.1 Recommendations for the Implementing agency

(1) Restart of Radio Publicity of Activities to Protect the GMR

While information on the sustainable management and development of the GMR was disseminated to fishermen via television and radio programs solely dedicated to the GMR under the Project, such publicity was not maintained after the project termination. Although the relationship between the DPNG and fishermen temporarily improved with the implementation of the Project, the latest beneficiary survey has found a worsening trend of this relationship. It is highly desirable for the DPNG to restart the dissemination of information on the GMR. Because of the cost implications of such activity, it is recommended that radio publicity is restarted as the most effective means of communication to fishermen.

(2) Restart of Environmental Education for Secondary School Students on Marine Protection in the Galapagos.

Although the cooperation is provided for the curriculum whose revision was planned as part of the educational reform the environmental education for secondary school students launched under the Project has not been continued. As the new constitution of Ecuador restricts the new settlement of Ecuadorians in the Galapagos, understanding of the need for long-term marine protection in the Galapagos among existing residents is extremely important. It is desirable for the DPNG to restart a volunteer training program and a program on the marine ecosystem in the Galapagos for secondary school students, both of which were implemented under the Project, to facilitate understanding of the need for long-term environmental protection among existing residents. According to the findings of the beneficiary survey conducted as

part of the present evaluation, the ratio of participants of educational programs under the Project subsequently participating in environmental activities is 2.4 times higher than the corresponding figure for local residents in general. The continuation of environmental education is believed to increase the number of residents agreeing with the activities of the DPNG, contributing to the smooth implementation of such activities.

(3) Promotion of Fishing Experience Tours Organized by Local Fishermen

The involvement of the DPNG in fishing experience tours which were supported under the Project is limited. Because of the restriction on new settlement in the Galapagos imposed by the new constitution, fishermen in the Galapagos are deemed to have a vested right for any fishing-related activity. It is desirable for suitable arrangements to be made to certify fishing experience tours as a business activity organized by local fishermen and approved by the local tourism sector. The DPNG should clarify its stance and cooperate for the promotion of fishing experience tours.

(4) Revitalisation of the JMP and Continual Allocation of the Necessary Budget

The DPNG should play a central role in securing funding sources to pay for the operation and administrative expenses of the JMP, including the employment cost of a facilitator. It is desirable to revitalize the JMP through the newly proposed remodeling of the JMP so that the opinions of local residents on GMR management are passed to the JMP via their representatives for the more proactive protection of the marine environment in the Galapagos.

4.2.2 Recommendations for the JICA

There is no specific recommendation to the JICA in connection with the ex-post evaluation of the Project on Conservation of the Galapagos Marine Reserve.

4.3 Lessons Learned

(1) When we plan technical assistance projects, we need to design feasible projects with logical framework and outputs after understanding the institutional arrangement of the C/P and the level of cooperation of people concerned. This project showed some problem of sustainability because the project scope was beyond their work scope. Also the project had extensive activities and the project objective was never set up with outputs based on the clear logical framework, even though PDM was revised twice after project started.

In order to avoid this situation, before the project starts, it is essential to elaborate target topics, clear logics to connect the project objective with outputs, and the refinement of people concerned while obtaining sufficient commitment of C/P on the activities beyond their regular work.

However, when a project becomes extensive scope due to the character of the target sector and/or the structure of concrete tasks or problems, it may not be easy to set a single goal or project objective to be achieved at the end of the project through the achievement of outputs. In such a case, it is essential to examine the possibility of narrowing down the project scope while taking the reduction of the project impacts into consideration. However, when the subject fields are diverse like the project aiming at nature conservation[19], narrowing of the project scope may make impact smaller with larger external conditions, potentially increasing the risk not to achieve positive impacts. When narrowing of the project scope is judged to be not advantageous, the description of the project objective should prioritize covering the scope of activities with clear aim of the project even if the description become abstract.[20]

(2) This project initiated activities which C/P had not had such work before (e.g. oceanography research, water quality monitoring, and supporting alternative income generation of fishermen). In this case, the budget and personnel arrangement of C/P may not be sufficient. The project implementation with expert dispatch and employment of local staff with technical expertise may initiate new activities or establishment of new division in the C/P[21]. It is important for project staff and C/P to develop mutual understanding in the process of technical transfer in order to be able to claim sufficient budget/personnel in C/P to continue the activities.

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[19] As mentioned in Box 1, activities designed to protect nature in development project are generally implemented through a political compromise of various sectors supported by multiple interest groups who are seeking of the two incompatible ideas: development and environmental conservation. The target areas and persons involved are, therefore, quite diverse. However, when the nature of the planned activities is justifiable from the viewpoint of both the aid organization and its counterpart organization, there is a possibility of producing wide-ranging significant impacts in the long-term because of the discovery of new activities rooted in the activities of the counterpart organization despite the weak relationship between the outputs.

[20] In the case of the present Project for example, its objective is described as “the management of the GMR is strengthened” instead of “the participatory management system of the GMR is strengthened”.

[21] In this project, as mentioned above, oceanography research and water monitoring were continued by counterpart organization voluntarily but support for alternative income generation of fishermen were not continued since the technical transfer was not sufficiently done.

(3) In this project the construction of Communication Center for Environmental Education (CCEE) was delayed due to the problem related to land use right. When constructing a new facility, the ownership and user rights of the land allocated to the construction should be ensured before planning the work.

Republic of Ecuador

Ex-Post Evaluation of Japanese Grant Aid Project
"Water System Improvement Project for Ibarra"

External Evaluator: Takeshi Yoshida
Global Group 21 Japan, Inc.

0. Summary

This project was implemented to establish stable and safe water supply by improving and providing water supply facilities and maintenance equipment in Ibarra, Ecuador. This objective has been highly relevant with the country's development plan, development needs in the time of both planning and ex-post evaluation, and consistent with Japan's ODA policy; therefore, the relevance of the project is high. Also, project output was delivered as planned, and both project cost and project period were within the plan; therefore, efficiency of the project is high. As one of the effects of the project, the rate of non-revenue water in urban areas decreased from 43% to 36% after the completion of the project. Also, the construction of reservoirs contributed to the stable amount of water supply, and 24-hour water supply was realized in all urban areas. In rural areas, the improvement of purifying plants in Aloburo and Zuleta achieved the improvement of water quality and the securing of sufficient amount of water. As a result, the project greatly contributed to the improvement of standard of living for local residents. This project has largely achieved its objectives; therefore, its effectiveness and impact are high. While there is no considerable problem in the maintenance of facilities and equipment, organizational structure is expected to be strengthened for non-revenue water prevention; therefore, sustainability of the project effect is fair.

In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description

Project Location

Purifying plant in Aloburo

1.1 Background

The city of Ibarra is the capital of Imbabura province, located at 2,200m above the sea level and about 120km north of Quito, the national capital of the Republic of Ecuador. Ibarra is the

transportation hub and commercial center of five provinces near the border with the Republic of Colombia. The main industries are agriculture and pasturage, manufacturing industry, and service industry.

At the time of 2005, water supply system of Ibarra had some problems. In urban areas, the water leakage rate was over 43% due to aging deterioration of water supply system build in the 1970s. Also, the use of water was regulated in many areas within the city because the construction of water supply system was not catching up on the increasing population and the extending urban areas. In rural areas, since water-purifying facilities were not sufficiently equipped, people had to use water of bad quality (high turbidity) during the rainy season.

Municipal Enterprise for Water Supply and Sewerage System of the City of Ibarra (Empresa Municipal de Agua Potable y Alcantarillado del Canton Ibarra; hereinafter referred to as "EMAPA-I") developed a "Water Supply System Improvement Plan for Ibarra" in 2003. For facility improvement and equipment procurement with high urgency and priority in the plan, EMAPA-I requested a grant aid project from JICA. This project was implemented for two terms.

1.2 Project Outline

The objective of this project is to establish stable and safe water supply by improving water supply facilities and providing maintenance equipment in Ibarra, Ecuador.

Grant Limit / Actual Grant Amount	(Term 1) 681million yen / 679million yen (Term 2) 372million yen / 366million yen
Exchange of Notes Date	(Term 1) August, 2005 (Term 2) June, 2006
Implementing Agency	Municipal Enterprise for Water Supply and Sewerage System of the City of Ibarra (EMAPA-I : Empresa Municipal de Agua Potable y Alcantarillado del Canton Ibarra)
Project Completion Date	(Term 1) March, 2007 (Term 2) February, 2008
Main Contractor(s)	Hazama Corporation
Main Consultant(s)	Kyowa Engineering Consultants Co., Ltd. Nihon Suido Consultants Co., Ltd. (JV)
Basic Design	November, 2004 – June 2005
Related Projects (if any)	N/A

2. Outline of the Evaluation Study

2.1 External Evaluator

Takeshi Yoshida, Global Group 21, Inc.

2.2 Duration of Evaluation Study

The ex-post evaluation study for the Project was conducted over the following period.

Duration of the Study	:	September, 2011 – September, 2012
Duration of the Field Study:		January 22, 2012 – February 2, 2012
		May 20, 2012 – May 28, 2012

2.3 Constraints during the Evaluation Study

N/A

3. Results of the Evaluation (Overall Rating: A[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance with the Development Plan of Ecuador

Ecuador's "National Development Plan (2011 - 2005)" stated that the improvement and spread of water supply and sewerage system was one of the most important issues of the country, and they were making efforts toward such improvement. However, when this project was planned, the rate of safe water supply was only 65 % in urban areas and 43% in rural areas, lower than neighboring countries. At the provincial level, they had "Strategic Development Plan" which prioritized the improvement of water supply facilities, based on the above national development plan. Following the national and provincial plans, EMAPA-I had prepared "Water System Improvement Plan for Ibarra" in 2003, and implemented the improvement of water supply facilities.

According to "National Plan for Good Life (2009 - 2013)", a national development plan as at the time of this ex-post evaluation, the widespread access of safe water is a human right determined by the constitution, and one of the national strategies to guarantee people's better life.

Thus, the stable supply of safe water has consistently been an important political issue of Ecuador.

3.1.2 Relevance with the Development Needs of Ecuador

As stated in the background section, Ibarra is the capital of Imbabura province and the commercial center of five provinces near the border with Colombia. However, at the time of 2005, the water leakage rate reached nearly 50% in urban areas due to aging deterioration of water supply system, and the use of water was regulated in many areas within the city[3]. Also, water pipes made of

[1] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[2] ③: High, ② Fair, ① Low

[3] Continuity of water supply differed depending on areas. Only the central area had 24 hour water supply. In some areas in the southeast, water supply was limited to only 6 hours a day.

asbestos cement had serious aging deterioration, and damaged parts were causing not only water leakage but also water contamination. Therefore, renewal of the deteriorated facilities was required, as well as the procurement of equipment for early detection of underground leakage, repair of water pipes, control of water delivery, and chlorine disinfection. At the same time, it was also required to improve the leakage prevention skills. In rural areas, deteriorating water quality during the rainy season was a problem.

In EMAPA-I's strategic plan for 2009 – 2014, the followings are the improvement objectives for overall management of water supply.

- Improvement of the potable water coverage from 93.51% to 96.52 %
- 100% compliance with EMAPA-I's water quality standard
- Improvement of non- revenue water from 44.13% to 39%

In 2011, non-revenue water of the city as a whole was 37.9%, reaching the objective; however, that of rural areas was high at 43.1%, and the improvement of non-revenue water is still a serious issue. Thus, since the planning of this project until today, it has been important issues to provide stable supply of potable water, secure water quality, and improve non-revenue water. Therefore, the relevance of this project with the development needs of the country is high.

3.1.3 Relevance with Japan's ODA Policy

In an aid policy dialogue with Ecuadorian government in February, 1999, it was confirmed that the focus of Japanese assistance to Ecuador would be in "poverty reduction", "infrastructure development", "environment protection", and "disaster management". This project was considered as "infrastructure development", corresponding to Japan's ODA policy at the time[4].

In summary, this project has been highly relevant with the country's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

3.2 Effectiveness[5] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

(1) Urban Areas

For stable water supply in urban areas of Ibarra, this project included (i) replacement of deteriorated conveyance pipes, transmission pipes, and distribution pipes to reduce water leakage, (ii) construction of reservoirs to improve water supply adjustment ability, and (iii) provision of equipment and training for inspecting and repairing water leakage points.

[4] The basic design of this project was studied in 2004. Later in July, 2005, a policy dialogue for economic cooperation was held between the local ODA task force (centering the Embassy of Japan in Ecuador) and Ecuadorian government. As a result, a new assistance policy was created, which consisted of three focusing areas, "poverty reduction", "environment protection", and "disaster management", with other specific development issues determined under them.

[5] Sub-rating for Effectiveness is to be put with consideration of Impact

As shown in Table 1, non-revenue water in urban areas decreased after the completion of this project in 2008, and has been improving due to the continuous effort of the city of Ibarra for improving facilities and reducing leakage[6]. As a result, the amount of revenue water per population increased while the amount of water supply per population decreased, indicating more effective use of limited water resources[7]. Moreover, due to the reduction in water leakage and the improvement of water supply adjustment ability, water supply regulation, which had used to affect approximately half of the population before the project, had become unnecessary in 2010.

Equipment for reducing leakage was provided to non-revenue water prevention office, a new office established as a division of engineering department. Such equipment was utilized for inspecting and repairing underground leakage points that had used to be difficult to detect. Together with the improvement of the skills of EMAPA-I's technical staff through technical assistance, the equipment contributed to the reduction in water leakage rate[8].

Thus, in urban areas, this project has largely achieved its intended effectiveness[9].

Table 1: Improvement of Water Supply System in Urban Areas

Item	2006	2008	2010
Non-revenue water rate (%)	43.1	41.9	36.0
Population with water supply (%)	99.8	100.0	100.0
Total annual water supply (1,000 m^3)	14,165	14,871	13,963
Water supply per person (liter/day)	327	319	292
Population with 24-hour water supply (%)	52	-	100
Total annual revenue water (1,000 m^3)	8,060	8,640	8,936
Revenue water per person (liter/day)	175	172	184

Source: EMAPA-I

(2) Rural Areas

During the rainy season, the quality of raw water gets worse, deteriorating the quality of supply water in rural areas. In order to solve this problem, two water purifying plants were repaired in the project to strengthen the water purifying capacity. As a result, settling reservoir and slow filter were added, enabling the treatment of high-turbid raw water during the rainy season. According to EMAPA-I data, the highest turbidity of supply water in target areas improved from 16.0NTU before the project (2006) to 3.7 NTU at the best after the project (2010) at Zuleta purifying plant[10]. However,

[6] Some of the request from Ecuadorian government was not included in this project (1 section of water pipes in urban areas, 1 reservoir, and 5 water purification facilities in rural areas). However, all of these facilities were constructed by the city of Ibarra by themselves. Also, EMAPA-I invested US$ 1.69 mil in 2008 and US$ 2.12 mil in 2010 for facility improvement.

[7] Total annual water supply and water supply per person decreased in 2010 because of the decrease in water leakage.

[8] At the time of this ex-post evaluation, non-revenue water prevention office had been merged into water supply division, and activities for non-revenue water prevention had been slowed (See 3.5 Sustainability).

[9] At the time of appraisal, the increase of population with 24-hour water supply and the reduction of non-revenue water (leakage) rate were set as indicators, but numerical targets of those were not set.

[10] NTU (Nephelometric Turbidity Units) is the units of turbidity from a nephelometer. It indicates the

at Aloburo purifying plant, during the rainy season, earth and sand mixed in raw water when raining could not be completely treated, and such water were distributed. Because the average turbidity was 5.6 NTU in 2010, being worse than the target of 5.0 NTU, rapid filtration was installed upstream by EMAPA-I's budget in 2011. Since then, supply water has not been overly deteriorated (the highest turbidity in 2012 is 4.3 NTU).

3.2.2 Qualitative Effects

Workshops with local residents were held in rural areas (Aloburo and El Tejar) and urban areas (Bella Vista) to hear opinions about this project from beneficiaries. As a result, it was confirmed that, both in urban and rural areas, this project had shown some effects such as stable water supply (longer supply hours and improvement of water pressure) and better water quality. (See 3.3 Impact for detail.)

3.3 Impact

3.3.1 Intended Impacts

This project was intended to contribute to the improvement of living environment in urban and rural areas of Ibarra. In order to study how residents' everyday life had changed due to the improvement of water supply, workshops were held with local residents in representative villages which were selected through discussion with EMAPA-I. Beneficiaries' opinions in the workshops revealed that the stability of water supply and the quality of water improved, contributing to their everyday life in following ways.

Water intake at Guaraczapas

Conveyance pipe at Esperanza

density of insoluble particles in a liquid measured by Nephelometric Turbidity Units. The higher the turbidity, the lower the clarity of the sample is. According to WHO guideline, the turbidity of potable water should be 5 NTU or lower.

Purifying plant at Zuleta

Rapid Filtration installed at Aloburo Purifying plant

Workshop with the local residents

A beneficiary washing plates

(1) Impact in urban areas

In Bella Vista area, a workshop was held with 27 local residents, and it became clear that there were some changes before and after the project in this area, as shown in Table 2. Before the project, water supply was regulated, and water outage often happened; therefore, they could not get enough water and sometimes had to go to rivers. After the completion of the project, however, some people said they became able to use the spare time for other jobs and earn some income. This area belongs to a water distributing area of Bella Vista de Caranqui reservoir which was extended through this project; therefore, the project contributed to these impacts to a certain degree.

Table 2: Change in Urban Areas before and after the Project (Bella Vista)

	Before the Project	After the Project
Cooking	- Water supply hours were regulated - Water outage sometimes happened - Time was taken for fetching water	- Water is available at any time - No water outage
Laundry	- When water supply was regulated during the dry season, laundry was done at streams - Laundry was possible only every 2 or 3 days	- Laundry is possible at any time - Clothes don't get dirt from laundry
Health	- Water sometimes got unclear - Diseases and parasites	- Better water quality - Less parasites
Others		- They became able to do other labor for the spare time that were used to be used for water drawing and laundry - They become able to earn additional income by raising animals and sawing and stitching

Table 3: Change in Rural Areas before and after the Project (Aloburo)

	Before the Project	After the Project
Cooking	- They used to go to rivers to draw water and carry in containers - They sometimes had to boil water	- Enough water is supplied for all necessities
Potable Water	- Water was unclear and colored - They sometimes used coal and sand filters to purify water - They sometimes had to purchase bottled water	- Water is clear - They do not need to buy bottled water - Water quality improved and is good for health
Bath	- Water supply was not enough - Water pressure was low at high place - They used rain water	- Enough water pressure even at high place
Laundry	- Water was dirty or sandy, so laundry clothes did not get clean - Water outage sometimes happened	- Some people use washing machine
Health	- Infectious diseases and parasites sometimes happened	- Infectious diseases and parasites disappeared

(2) Impact in rural areas

In Aloburo area (population: 4,000), a workshop was held with 19 local residents to hear residents' opinion for the change before and after the project (See Table 3). Before the project, both water supply hours and amount were not sufficient, and going to rivers for drawing water was a part of their daily life. Also, they sometimes had to use high- turbid water. After the project, the quality of water got better, and some said diseases such as parasites decreased. The improvement of Aloburo

purifying plant through this project seems to contribute to the improvement of water quality and the elimination of water shortage which used to be caused by the increased turbidity during the rainy season.

El Tejar, another village in the distribution area of Zuleta purifying plant, is located at hilly area. A participatory workshop was conducted with 24 local residents to hear their opinions. Before the implementation of this project, they did not have enough water because of the water supply regulation and had to draw water from rivers for cooking and laundry. However, after the project, they became able to use such time for other work. Also, before the project, children did not wash their hands at home even though they were told to do so at school because they did not have enough access to good-quality water. However, they started to acquire the habit of washing hands now. Therefore, this project would have contributed to the improvement of sanitation.

Table 4: Change in Rural Areas before and after the Project (Zuleta purifying plant, El Tejar)

	Before the Project	After the Project
Water Supply Hours	- Only 2 hours	- Available at any time
Water Quality	- Water was sandy, unclear, and colored	- Water quality got better, and few people boil water before drinking
Cooking	- Women had to fetch water	- No need for fetching water
Laundry	- Laundry was done at rivers	- No need to go to rivers for laundry, and the spare time can be used for resting, other work, and family care
Water Storage	- They had to store water in big tanks	- No need for water storage
Washing Hands	- Children did not have habit of washing hands	- Children acquired the habit of washing hands

3.3.2 Other Impacts

No negative impacts on the local area and residents and the natural environment have been reported.

No big issue was reported on land acquisition and resettlement, as there was no resettlement and underground installation was made where the pipes are constructed on private land. According to EMAPA-I, there were opposing opinions against the construction of water pipes under one road in a village, so they changed the route to cut across a farm land, but no land purchase was necessary due to this change.

Based on the above, this project has largely achieved its objectives, therefore its effectiveness is high.

3.4 Efficiency (Rating: ③)

3.4.1 Project Outputs

As shown in Table 5, the output of this project is implemented as planned. In urban areas, 3 sections (14.2 km) of conveyance and transmission pipes were renewed, and reservoirs were constructed in 5 areas. Also, distribution tanks were constructed in Caranqui purifying plant, and flowmeters and equipment for leakage reduction were procured. In rural areas, purifying plants were improved in 2 areas. Also, as soft components, technology transfer to EMAPA-I was conducted for inspecting and reducing water leakage.

Table 5: Comparison of Planned and Actual Output

Planned Output	Actual Output
① Renewal of conveyance pipes and transmission pipes in urban areas (3 sections, about 14.2 km) Guaraczapas purifying plant - Caranqui purifying plant (11.8 km) Yuyucocha intake - Caranqui purifying plant (1.0 km) Guaraczapas intake - Guaraczapas purifying plant (1.4 km)	① Renewal of conveyance pipes and transmission pipes in urban areas: implemented as planned
② Construction of reservoirs in urban areas (5 areas) Azaya (2,500m3×1), Chuchupungo (100 m3×2) Bella Vista de Caranqui (100 m3×2) Santa Rosa (100m3×2), TRP#6 (100m3×2)	② Construction of reservoirs in urban areas: implemented as planned
③ Improvement of purifying plants in rural areas (Aloburo Priorato area, Zuleta area): extension of regular settling reservoir and slow filter	③ Improvement of purifying plants in rural areas: implemented as planned
④ Distribution tanks in Caranqui purifying plant	④ Distribution tanks in Caranqui purifying plant: implemented as planned
⑤ Procurement of flowmeters (36 points), equipment for leakage reduction, and others (1 set)	⑤ Procurement of flowmeters, etc.: implemented as planned
⑥ Technical assistance to counterparts for inspecting and reducing leakage (soft component)	⑥ Soft components: implemented as planned
⑦ Construction work financed by Ecuadorian government: fences for reservoirs, etc.	⑦ Construction work financed by Ecuadorian government: implemented as planned

3.4.2 Project Inputs

3.4.2.1 Project Cost

As shown in Table 6, the actual project cost (1,055 million yen) was lower than the planned project cost (1,070 million yen, 99% of the planned cost).

Table 6: Comparison of Planned and Actual Project Cost

Planned Cost	Actual Cost
1,070 million yen (Japan's contribution: 1,057 million yen, Ecuador's contribution: 13 million yen)	1,055 million yen (Japan's contribution: 1,046 million yen, Ecuador's contribution: 9 million yen, using average exchange rate of 2007-2009, US$1 = ¥104.99)

3.4.2.2 Project Period

The actual project period (32 months) was shorter than the planned project period (35 months, 91% of the planned period).

Both project cost and project period were within the plan, therefore efficiency of the project is high.

3.5 Sustainability (Rating: ②)

3.5.1 Structural Aspects of Operation and Maintenance

EMAPA-I, established in 1969, is in charge of the operation and maintenance of the facilities and equipment constructed and improved by the project. In 2005, EMAPA-I had total of 246 officials, including 145 in technical department, 45 in administration department, and 46 in financial department. In 2004, non-revenue water prevention office was established in engineering department with 7 officials mainly for the repair of water leakage on the ground.

As of 2012, EMAPA-I has increased its officials to 314, including 173 in technical department. After the completion of the project, non-revenue water prevention office in technical department utilized the equipment procured through the project to reduce water leakage. However, this office has merged into water supply division in engineering department. This was due to the central government's instruction for unifying the organization structure of public corporations. However, as mentioned in the section of effectiveness, after the organizational change, it was observed that activities for non-revenue water prevention decreased and equipment is not fully utilized[11]. In addition, the loss of an organizational unit which has a name reflecting the important objective of reducing non-revenue water would result in unclear sense of purpose and lower motivation of personnel in charge. It would also make it difficult to transfer specialized skills to other engineers because skilled

[11] The officials in non-revenue water prevention office received technical assistance for leakage inspection as a soft component part of the project, but after the organizational change, they are assigned to new projects, and activities for non-revenue water prevention has slowed. Among the equipment procured through the project, leakage detectors are not used at the time of this evaluation.

engineers and technicians are scattered in the organization.

During the field visit for this evaluation, his structural issue was addressed in the meeting with the director-general and the manager of engineering department, and the director-general expressed his opinion that it would be better to have non-revenue water prevention office independent as it was for their operation. Thus, it was stated that the operation would return to non-revenue prevention office.

Personnel increase was suggested at two purifying plants in rural areas during defect inspection, and it has been corresponded as suggested.

3.5.2 Technical Aspects of Operation and Maintenance

EMAPA-I experienced a severe sanitary accident in 2002, allowing the inflow of sewerage water to supplying water due to the breakage of water pipes. Since then, they have been making effort to improve their technical skills in order to prevent such accident. EMAPA-I has an alliance with the municipal enterprise for water supply and sewerage system of Quito. EMAPA-I also provides regular trainings for engineers, and their technical skills are considered as at high level. Moreover, it has quality assurance division and organizational development division, which aims at obtaining ISO certification; one of the reasons is the prevention of such accidents as above. For ISO 9001 (quality management), they have already obtained in urban areas, and the target year for rural areas is 2014. For ISO14001 (environmental management), they are in the application process and planning to obtain it in 2013.

As a part of the project, they provided equipment and technical assistance for leakage prevention. Those engineers and technicians who received such assistance are in the operation of leakage prevention. It shows the continuity of the technical aspect provided through the project.

It seems that they are quickly responding to troubles after the completion of the project. For example, when water pipes across a river in La Esperanza got damaged because of a flood in 2011, they recovered the damage in one week. Therefore, there is no big issue for technical capacity for operation and maintenance.

3.5.3 Financial Aspects of Operation and Maintenance

As shown in Table 7, the financial situation of EMAPA-I has been progressing favorably. The periodical increase in unit price and the improvement of fee collection rate greatly contributed to the increase in income from water supply fee[12]. The balance is surplus every year, and they use it for investment such as facility renewal. Considering operation and maintenance, EMAPA-I has no financial issues in short term.

[12] For example, water supply fee increased by 12 % on average in 2011.

Table 7: Financial Situation in EMAPA-I (Unit: US$ 1,000)

	2004	2008	2010
Income	3,712	6,111	7,297
Water supply fee	2,214	3,428	4,087
Expenditure	3,478	4,974	6,078
Personnel cost	1,603	2,822	3,441
Other expenditure	1,875	2,152	2,638
Balance	234	1,137	1,218

Source: EMAPA-I

3.5.4 Current Status of Operation and Maintenance

As a result of the field survey, operation and maintenance of the facilities constructed by the project are fairly managed with no considerable issue. The covers of Azaya reservoir, which were reported as stolen in the defect inspection, were replaced by new ones. Fences for reservoirs, whose necessity was pointed in the inspection, were also set by EMAPA-I's finance. In Aloburo purifying plant, when it rained, earth and sand mixed in raw water could not be completely filtered and distributed as water supply. Thus, EMAPA-I installed rapid filtration equipment upstream by its own budget (about US$ 8,000) in 2011. Since then, distributing water has not been deteriorated. Among the procured equipment, leakage detectors are not utilized because non-revenue water reduction activities have been slowed. A compactor, a roadroller, drain pumps, a dump truck, and a backhoe are properly managed and utilized for various maintenance activities because they can be used for multiple purposes.

Equipment provided by the project (small power shovel)

Works for water leakage prevention

In summary, some problems have been observed in terms of structural aspects of operation and maintenance, therefore sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented to establish stable and safe water supply by improving and providing water supply facilities and maintenance equipment in Ibarra, Ecuador. This objective has been highly relevant with the country's development plan, development needs in the time of both planning and ex-post evaluation, and consistent with Japan's ODA policy; therefore, the relevance of the project is high. Also, project output was delivered as planned, and both project cost and project period were within the plan; therefore, efficiency of the project is high. As one of the effects of the project, the rate of non-revenue water in urban areas decreased from 43% to 36% after the completion of the project. Also, the construction of reservoirs contributed to the stable amount of water supply, and 24-hour water supply was realized in all urban areas. In rural areas, the improvement of purifying plants in Aloburo and Zuleta achieved the improvement of water quality and the securing of sufficient amount of water. As a result, the project greatly contributed to the improvement of standard of living for local residents. This project has largely achieved its objectives; therefore, its effectiveness and impact are high. While there is no considerable problem in the maintenance of facilities and equipment, organizational structure is expected to be strengthened for non-revenue water prevention; therefore, sustainability of the project effect is fair. In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

The improvement of facilities through the project contributed to the reduction of water leakage, which is an effective way to respond to the increase in water supply in short term. However, non-revenue water prevention office was merged into another division as a part of EMAPA-I's organizational restructuring. Officials are in charge of other operations in addition to non-revenue water prevention, and it would lead to unclear sense of purpose and degree of achievement. It would also make skilled engineers and technicians scattered in the organization. In reverse, maintaining an organization with specialized skills may contribute to effective operation and easier technology transfer. Currently, EMAPA-I is considering to make non-revenue water prevention office independent again, which is recommended to be realized as soon as possible for fully utilizing and maintaining the ability of preventing non-revenue water obtained through the project.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

<u>The importance of technical consideration in the basic design:</u>

Aloburo purifying plant was planned with slow filtration method. However, after the

completion of the project, it became apparent that the plant could not sufficiently treat the raw water when it rained much during the rainy season. Therefore, EMAPA-I had to install rapid filtration by their own budget. Slow filtration method was selected assumably because operation was easier and operational cost was relatively lower without chemicals. It would be also because sample raw water for planning was not taken during the season of most severe rain. Therefore, in basic design study, they should have considered the fluctuation in the quality of raw water and had repeated discussion for technical aspects with EMAPA-I.

Republic of Peru

Ex-Post Evaluation of Japanese ODA Loan Project
"Sierra - Natural Resources Management and Poverty Alleviation Project (III)"

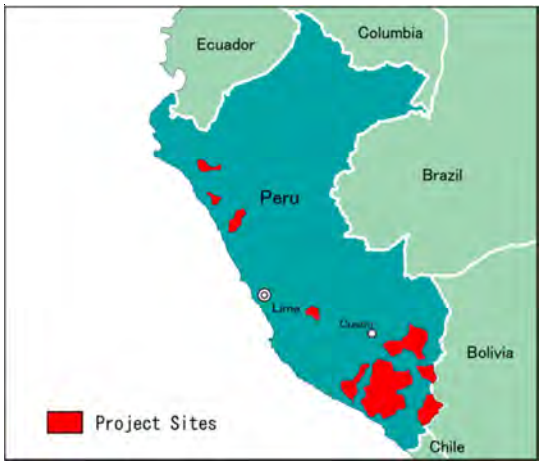
External Evaluator: Hajime Sonoda
Global Group 21 Japan, Inc.

0. Summary

This Project was implemented for the purpose of increasing the agricultural productivity in Peru's Sierra where poverty is prevalent while trying to ensure environmental conservation. This purpose was consistent with the development policies of the Government of Peru and there was an urgent need for this type of project to be implemented in Peru. It also conformed to Japan's ODA policy and its overall relevance was high. Only 84% of the project budget was executed, partly because of the suspended disbursement of the Japanese ODA loan and the output in terms of irrigation facilities did not reach the original target. On the other hand, because of the extension of the loan period to accommodate the longer implementation period than planned, the efficiency of the Project is evaluated to be fair.

In total, some 48,000 households in 1,683 villages benefited from the Project. Some positive impacts have been made on the economic activities and daily lives of the benefited farming households through improved levels of environmental conservation and agricultural productivity. As the achievement rate of the planned target of the Project in terms of the area coverage is estimated to be 70 – 80%, the effectiveness of the Project is judged to be fair. There is some concern regarding future funding for the executing agency and the sustainability of communal fund management as well as tree seedling production by the farmers who benefited from the Project. While, although the maintenance situation of the newly constructed facilities is not perfect, their functions are generally sustained. Based on the above findings, sustainability of the Project is fair. In light of the above, the Project is evaluated to be partially satisfactory.

1. Project Description



Map of the Project Sites

Soil conservation works (Slow formation terrace: Ancash)

1.1 Background

The Sierra in Peru which accounts for 30% of the national land area receives rainfall predominantly in a three month period, making the land vulnerable to landslides, debris flows and loss of the top soil in these months. Over a period of many thousand years, the indigenous people of Peru developed terraces covering some 1 million ha of steep slopes and utilised complex irrigation systems to farm in the Sierra. However, these traditional skills were lost during and after the Spanish rule (1532 - 1821) and many of these terraces were abandoned. In more recent years, the increase of the population resulted in the expansion of farmland by cutting down trees, resulting in a vicious cycle of soil loss, depletion of water resources and declining agricultural productivity. Consequently, farming communities in the Sierra were impoverished and many rural inhabitants who could no longer sustain their lives through agriculture moved to urban areas from the 1950's to the 1980's. In the 1990's, the remaining farmers were engaged in traditional extensive farming in isolated settlements along the steep terrain amidst a harsh natural environment. The productivity was low and poverty was both severe and widespread.[1]

In 1981, the Government of Peru established the Office of the National Programme for Water Resources and Soil Conservation (El Programa Nacional de Manejo de Cuencas Hidrograficas y Conservacion de Suelos: PRONAMACHCS) under the Ministry of Agriculture for the purposes of improving agricultural productivity and conservation of the natural environment in the poverty-stricken Sierra. The PRONAMACHCS was primarily engaged in the promotion of soil conservation through terracing, and, since 1997 with the assistance of the World Bank, the scope of its activities was expanded to invest in soil conservation, small-scale irrigation and reforestation projects as well as to strengthen farmers' organizations and PRONAMACHCS in a comprehensive and intensive manner while encouraging the active participation of local farmers.[2] In November of the same year, the JICA (former OECF) offered an ODA loan of 5,677 million yen, targeting different areas from those of the World Bank, under the Sierra - Natural Resources Management and Poverty Alleviation Project (hereinafter referred as "the Project"). Two years later in 1999, Phase 2 of the Project was implemented, followed by Phase 3 (the subject of this ex-post evaluation) in 2000. Meanwhile, the PRONAMACHCS was integrated in 2008 to the Agricultural Productivity Development Program (Programa de Desarrollo Productivo Agrario Rural; hereinafter referred to as the "AGRORURAL"), a newly established body in the Ministry of Agriculture.

[1] As of 1995, 10.5 million, accounting for nearly half of Peru's population, were classified as poor while two-thirds of the population in the Sierra were classified as poor, half of which were classified as extremely poor (illiteracy rate of more than 40%, school enrolment rate of less than 60%, sewerage coverage of 1 - 17%, water supply coverage of 9 – 56%, infant mortality rate of 111 – 170 in 1,000 and agricultural population rate of 44 – 86%).

[2] In April 1997, the World Bank offered US$ 51 million under the Sierra - Natural Resources Management and Poverty Alleviation Project (P042442). This was an investment project with a consistent project period of five years targeting specified small watersheds and aiming at making local farmers develop the capacity in this period to manage their agricultural production activities by themselves.

1.2 Project Outline

The Project aimed at conserving soil, forests and water resources along with improvement of the agricultural productivity through investment in soil conservation facilities[3], irrigation facilities, reforestation to ensure the productive and sustainable utilisation of natural resources in the Sierra of Peru, thereby contributing to poverty alleviation in the said area.

Approved Loan Amount/ Disbursed Loan Amount	5,588 million yen/ 4,516 million yen
Exchange of Notes/ Loan Agreement	September, 2000/ September, 2000
Terms and Conditions	Main Loans Interest Rate: 1.7% Repayment Period: 25 years Grace Period: 7 years Procurement: General Untied Consulting Service Interest Rate: 0.75% Repayment Period: 40 years Grace Period: 10 years Procurement: Bilateral Tied
Borrower/Executing Agency	AGRORURAL (former PRONAMACHCS) of the Ministry of Agriculture
Final Disbursement	October, 2009
Main Contractor (Over 1 billion yen)	None
Consultant (Over 100 million yen)	Nippon Koei (Japan)
Related Studies	None
Related Projects	Sierra - Natural Resources Management and Poverty Alleviation Project (1997) Sierra - Natural Resources Management and Poverty Alleviation Project (II) (1999)

2. Outline of the Evaluation Study

2.1 External Evaluator

Hajime Sonoda (Global Group 21 Japan, Inc.)

2.2 Duration of Evaluation Study

The ex-post evaluation study for the Project was conducted over the following period.

Duration of the Study : October, 2011 to September, 2012

Duration of the Field Study : 16th November to 18th December, 2011

18th to 25th April, 2012

[3] During the project period, facilities to prevent soil erosion at sloping land and facilities to encourage the efficient infiltration of rainwater into the ground to increase the soil moisture level were constructed among others by local farmers who were to benefit from these facilities. See 3.4.1 for further details.

2.3 Constraints to the Evaluation Study

The target area of the Project covered 13 regions scattered throughout the Sierra of Peru. For this ex-post evaluation, as no information on the project effects generally applicable to all of the project sites was obtained, the overall project effects were inferred based on the case studies (involving site visits and a beneficiary survey involving 256 households in 13 villages) in four small watersheds located in the Ancash and Puno Regions,[4] and interviews with executing agency staff. At the time of project approval, adequate indicators or target values to quantify the project effectiveness (in terms of the environmental conservation effect and productivity improvement effect) were not set. Quantitative judgement was, therefore, attempted by the present evaluation using only the size of the land area where tangible project effects emerged.

3. Evaluation Results (Overall Rating: C[5])

3.1 Relevance (Rating: ③[6])

3.1.1 Relevance with the Development Plan of Peru

The Second Fujimori Administration (1995 – 2000) at the time of the project appraisal identified poverty alleviation as an issue of the highest priority and aimed at maintaining the social welfare expenditure at least 40% of the annual government budget. The Humala Administration inaugurated in July, 2011 also placed emphasis on poverty alleviation. It plans to increase the level of taxation on the mining sector with a view to allocating tax revenue from this source to the funding of poverty alleviation measures so that economic growth and social development go hand-in-hand.

The medium-term agricultural development plan[7] of Peru identifies three priority targets: increased international competitiveness of Peru's agricultural sector, sustainable utilisation of natural resources and promotion of the use of various inputs and services for agricultural production. It sets out a number of measures along with five policy axes (water resources management, promotion of agri-businesses, improved hygiene control and safety of agricultural products, improved technical skills of producers and management/conservation of forest resources and natural flora). The plan lists the strengthening of irrigation organizations, reforestation and soil conservation as tasks for water resources management in the Sierra. The operating guidelines prepared when the AGRORURAL was established in 2008 did not clearly specify support for the extremely poor and the conservation of natural resources, including soil conservation and reforestation, in its policy menu. However, it is planned that the new guidelines to be adopted after the revision in 2012 by the AGRORURAL will include clear reference to the need for support for the extremely poor and the conservation of natural resources in the revised policy menu.

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[4] The beneficiary survey involved one workshop which was attended by representatives of the executing agency and benefitting farmers in each small watershed while interviews were conducted with the village head and representative of benefitting farmers. In addition, a household questionnaire survey was conducted with 171 benefitting households and 85 non-benefitting households.

[5] A: Highly Satisfactory, B: Satisfactory; C: Partially Satisfactory; D: Unsatisfactory

[6] ③: High, ② Fair, ① Low

[7] Plan Estategico Multianual del Sector Agricultura 2012 - 2016

The Project, which aimed at improving agricultural productivity in the poverty-stricken Sierra of Peru while attempting to enhance environmental conservation, was consistent with the important policy issue of Peru from the time of its initial appraisal to the time of its ex-post evaluation.

3.1.2 Relevance with the Development Needs of Peru

According to data compiled by the National Institute of Statistics and Information of Peru, the poverty ratio in rural areas of the Sierra fell from 76% in 2004 to 66% in 2009 but was still higher than that of the coastal area (41%) and the Amazon are (57%). Both the income per household in rural areas of the Sierra of some 91% of the national average in 2009 and the agricultural income of some 89% of the national average in 2010 were lower than those of the coastal area and the Amazon area. There are still many inclined areas experiencing continuous soil erosion even today, and the expansion of stock farming has increased the pressure for environmental degradation in some areas. As described in 1.1 – Background, improvement of the agricultural productivity while ensuring environmental conservation is a major challenge for the poverty-stricken Sierra, making the implementation of the present Project highly necessary. The Project was implemented in high priority areas from the viewpoint of poverty alleviation and environmental conservation in those districts classified as below the extremely poor level in the Sierra but not included in the World Bank project or the preceding two yen loan projects.

The overall picture of the Sierra is that while poverty has been decreasing, the local poverty ratio is still high when compared with other parts of Peru. Meanwhile, the level of agricultural income is low and environmental conservation is essential in the Sierra, indicating that there is still a strong development need for projects similar to the present Project.

3.1.3 Relevance with Japan's ODA Policy

Having highly evaluated the reform efforts of the Fujimori Administration to achieve sustainable growth and poverty eradication in the 1990's, Japan actively provided ODA to match the diverse development needs of Peru while keeping the need for the better quality and quantity of ODA in mind. The JICA's Country Assistance Programme for Peru (2000) identified four priority areas for Japanese assistance, i.e. poverty alleviation, social sector assistance, economic infrastructure development and environmental conservation. The Project did, therefore, conform to Japan's ODA policy.

Based on these observations, this Project has been highly relevant with the country's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

Absorption terraces *

Infiltration ditch (Puno)

Slow formation terrace (Puno)

Irrigation channel (Ancash)

Tree nursery (Ancash)

Pine plantation (Ancash)

(*) Taken from the web-sites of AGRORURAL. Others were provided by the Evaluator.

3.2 Effectiveness[8] (Rating: ②)

3.2.1 Quantitative Effects

The Project was implemented for the purpose of conserving the natural environment, including soil, forests and water resources, and improving the agricultural productivity. At the time of the appraisal, the Project was expected to benefit some 48,900 households in 1,060 villages through the achievement of its purpose. In reality, positive effects were produced for some 48,000 households in 1,683 villages as described below.[9] In addition to the data described above, no data that can represent the overall effects of the entire Project has been obtained.

(1) Environmental Conservation Effect

The environmental conservation effect of the Project is expected in an area of some 90,000 ha[10] due to the work outlined below. This figure represents some 93% of the originally planned figure of 97,000 ha[11].

① Construction of soil conservation works at inclined farmland (50,888 ha)

- Slow formation terraces (29,033 ha): Low stone or earth ridges are created on gently sloping land. Utilising the natural phenomenon of the top soil being slowly carried downwards on the slope by runoff water, terraces are eventually formed over a period of 5 – 10 years, substantially reducing the amount of soil loss. When the eroded soil fills up to the top of the ridge after several years, second and third ridges are created on top of the previous ridge to develop flat terraces in the end.
- Adsorption terraces (4,120 ha): These terraces are created on steep slopes with a gradient of 30% or more using narrowly spaced stone walls, etc., substantially reducing the soil loss from such slopes.[12]
- Infiltration ditches (17,735 ha): Flat ditches are dug along the contour lines on gentle or steep slopes to reduce the loss of top soil while encouraging the infiltration of runoff water into the

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[8] Sub-rating for Effectiveness is to be put with consideration of Impact

[9] At the time of the appraisal, no appropriate quantitative indicators were established to quantify the effectiveness of the Project. For the present evaluation, areas in which positive effects have emerged are used for quantitative judgement of the effectiveness.

[10] Although it would be necessary to consider the areas of soil conservation works and reforestation added by local farmers since the completion of Project and the total size of the areas where soil conservation works have not been properly maintained, it was practically impossible to accurately estimate the sizes of these areas. These areas are not, therefore, considered in the present evaluation.

[11] The size of the planned area is the total of the planned area for soil conservation work (5,300 ha of adsorption terraces, 21,200 ha of slow formation terraces and 31,800 ha of infiltration ditches) and the planned reforestation area (38,690 ha) (see Table 1). For reforestation, only areas of newly created plantations were considered, not considering areas subject to forest management (replanting one year after initial planting, irrigation and other) or forest protection (construction of protective fencing at existing plantations and other).

[12] While adsorption terraces offer excellent soil conservation and productivity improvement effects, they are quite expensive to construct and are unsuitable for cultivation using oxen. Because of these drawbacks, their popularity began to wane in the 1990's.

ground to increase the soil moisture and to replenish the groundwater with a view to facilitating the growth of trees and crops at the lower end of the slopes and beyond.[13]

② Reforestation (38,884 ha)

- Small to medium size forests (plantations) were created on common as well as private land. Planting was also conducted along terrace or private land boundaries to create hedges. While many of these newly created plantations are destined to become production forests of such exotic species as eucalyptus and pine, there are some cases of conservation forests being created in water source areas and areas suffering from heavy soil erosion. It has been reported that 38,884 ha of land were planted under the Project. However, this figure includes the converted figure of the number of seedlings planted to create hedges to the area.[14]

(2) Productivity Improvement Effect

The productivity improvement effect of the Project is expected to emerge over an area of some 70,400 ha due to the following reasons. This figure represents some 60% of the originally planned 117,000 ha and is primarily the result of the much lower achievement in construction of irrigation facilities than planned due to the suspended disbursement of the Japanese ODA loan (further details are given in 3.4.2- Inputs)[15].

① Area of farmland where the productivity is expected to improve due to soil conservation works (50,888 ha: It is assumed that the productivity will improve in the entire area where soil conservation works have been newly constructed.)[16]

② Area of farmland where the productivity is expected to improve due to the improvement/introduction of irrigation facilities (19,400 ha: It is assumed that the productivity will improve at 85% of the 22,800 ha due to the new irrigation facilities.)[17]

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[13] According to a study conducted by the AGRORURAL in 2011, infiltration ditches have the effect of halving the volume of soil loss.

[14] The number of seedlings used for live hedges, etc. is converted to the standard plantation size when the same number of seedlings is planted.

[15] The size of the planned area is the total of the planned area for soil conservation (see Footnote 11) and the subject area for irrigation (22,800 ha). The degree of productivity improvement is not considered here because (i) the relevant target value was not set at the time of appraisal and (ii) actual representative values (baseline data and actual post-project data) for the entire project were unavailable.

[16] Under the Project, benefitting farmers received seeds of improved potato and grass varieties (introduction of improved crops and grass), resulting in a substantial productivity improvement. However, as the target sites were farmland where soil conservation measures had been introduced, the areas planted with improved grass and crops are not included to avoid duplication. It is also necessary to consider the total size of the areas of soil conservation works and reforestation which have been added by local farmers since the completion of the Project and the total size of the areas where soil conservation works have not been properly maintained under normal conditions. However, it was practically impossible to accurately estimate the size of these areas. These areas are not, therefore, considered in the present evaluation.

[17] Based on a study on a similar project of the World Bank, the actual area served by operating irrigation facilities is assumed to be 85% of the planned service area.

Based on the above, the productivity improvement and environmental conservation effects of the Project will emerge over an area of some 160,000ha or 76% of the originally planned some 210,000 ha.

3.2.2 Qualitative Effects

The field visits and surveys conducted in four small watersheds in Puno and Ancash confirmed the following project effects.

- Half of the soil conservation works were constructed on commonly owned farmland while the other half were constructed on private land. Some 15% of private land had new soil conservation works. While 44% of the benefitting farmers found the soil conservation works to be very useful, primarily because of better crop growth due to reduced soil loss and better water retention of the soil, 16% found them to be useful for the same reasons. The soil conservation effect of the new soil conservation works has been maintained at more than 90% of the served areas and the land is utilised for farming or stock raising. Meanwhile, some 30 – 40% of the infiltration ditches constructed on commonly owned farmland have lost part of their function due to insufficient communal maintenance work. The field visits discovered cases where the first stage of a slow formation terrace had been completed to allow cultivation on the terrace, cases where the growth of grass had improved on the land situation below an infiltration ditch and cases where the volume of spring water had become steady.

- 60% of the beneficiaries actually received seed potatoes, etc. of improved varieties and their crop yields have much increased compared to those of conventional varieties. Improved grass has led to an increase of the grass production volume. Together with an increased number and improved breeds of caws (not part of the Project), the production volume of milk has much increased.

- Half of the reforestation was conducted at commonly owned land while the remaining half was conducted at private land. The average reforestation area was some 37 ha per village or some 2 ha per benefitting farmer. 80% of these plantations aim at the development of production forests using such exotic species as eucalyptus and pine (predominantly eucalyptus). Because of the strong demand for timber, etc., eucalyptus is preferred as it can be harvested several times over a period of 20 years through regeneration by sprouting. The positive effect of frost damage prevention as a result of an improved micro-climate was reported. 58% and 17% of the beneficiaries evaluated the reforestation work as “very useful” and “useful” respectively. The number of tree seedlings planted by the beneficiaries of the Project in the last 10 years is four times more than the number of tree seedlings planted by non-beneficiaries and the beneficiaries possess three times more trees today than non-beneficiaries.

- While most of the tree nurseries are still in operation and producing seedlings, their actual production volume has dropped to 50 – 70% of the volume produced in the project period. Since the completion of the Project, the production ratio of local species of which the seeds are easier to obtain has increased.

- As far as the increase and stabilisation of the agricultural productivity and production volume are concerned, an increase and stabilization of the productivity and production volume of the main crops, primarily potatoes, and grass has been observed, presumably due to the reduced level of soil loss and retention of soil moisture by the soil conservation works, frost damage mitigation by planted trees and hedges[18] and introduction of improved varieties.

- Irrigation has greatly contributed to improving the productivity of crops and grass. The use of irrigation water has boosted the productivity increase of potatoes by more than 50%. There are cases where intercropping has become viable. There is also the case of the cultivation of grass using an improved variety.

- Examples of the Project's support for women's enterprise initiatives include the production and marketing of seed potatoes of a certified improved variety and the production and marketing of such dairy products as cheese and yoghurt. Guidance was provided on the culture of cuy and the production of handicrafts but has not yet produced any successful businesses.[19] Thus, the effect to local farmers' income is limited.

The degree of the actual manifestation of these effects varies depending on the natural conditions and other factors in each locality. The findings of the field survey suggest that the expected effects have generally been achieved. The Project involved a model project (micro-watershed management) under which large amounts of inputs in terms of study, training and strengthening of organizations were made in three specified micro-watersheds. These extensive efforts appear to have produced such good results as the formation of project contents which are better suited to the local natural conditions, higher levels of knowledge, skills and motivation among farmers and energetic farmers' organizations.

3.3 Impacts

3.3.1 Intended Impacts

(1) Impacts on Poverty Alleviation

The Project was expected to contribute to increased income and poverty alleviation among the benefitting farmers, and reduction of the migration of farmers to urban areas. The findings of the field visit and the household survey indicate the following relevant impacts.

[18] Compared to non-benefitting farmers, benefitting farmers experienced 10 – 20% less frost damage to their potatoes.

[19] Cuy is a type of rodent (guinea pig), the meat of which is eaten in the Andes. The breeding of such rodents is often difficult in Puno because of its unfavourable cold climate. Another example of a less successful attempt was the plant dyeing of alpaca wool as a type of handicraft but the lack of marketing outlets made continued production impossible.

Production and sale of improved seed potatoes (Ancash)

Plant dyed alpaca wool (Puno)

- The agricultural and livestock production volumes have increased and become steady. The contribution of the newly introduced improved varieties is particularly evident. However, agriculture and livestock farming in the Sierra are still subject to various constraints such as insufficient water supply, use of improved varieties and crop diversification, damage by diseases and pests and an unfavourable climate, etc., and the overall situation has not changed much.
- The benefitting farming households have slightly increased their dependence on agriculture and stock farming for their livelihood compared to the non-benefitting farming households. One example is the substantial increase of stock farming in Puno where the benefitting farming households possess more cows of an improved variety.[20]
- The ratio of marketed agricultural products among the benefitting farming households is higher than that of the non-benefitting farming households. The actual figures based on weight are 51% (35% in the case of non-benefitting farming households) for potatoes and 49% (30% in the case of non-benefitting farming households) for barley.
- Reforestation has made it easier for local residents to be self-sufficient in regard to the supply of firewood and timber.
- The understanding of such resources management methods as soil conservation and reforestation and their importance has greatly improved among local residents. Some benefitting farmers have started to construct soil conservation works and to plant seedlings on a self-help basis in order to continue the activities introduced under the Project.
- The soil conservation committee had accumulated experience of joint work, boosting the confidence of local farmers.[21]

[20] It is considered that the Project had indirect contribution to this change through introduction of improved grass and trainings on cattle raising, while the improvement of caw was not made through the Project.

[21] Refer section 3.4.1 Output.

- While the income of the benefitting farmers has increased by 30 – 40% in 10 years, there is no significant difference between the benefitting farmers and non-benefitting farmers in terms of the increase rate.
- No confirmation has been made by the present evaluation of a decline of the population outflow from rural areas to urban areas for seasonal or permanent work.
- The main areas of contribution by the Project as perceived by the beneficiaries are listed below (ratio of beneficiaries acknowledging important contributions).

  - Increase of forest areas and forest trees (73%)
  - Increase of joint work and mutual help among villagers (61%)
  - Enrichment of water regime in general and increase of soil moisture (43%)
  - Decrease of soil erosion (32%)
  - Increased agricultural production (27%)
  - Increased sales to the agricultural market (27%)

There are villages in the Sierra which receive hardly any support from the local government or NGOs and where the AGRORURAL is the only body providing direct support for farmers. The activities under the Project and those by the AGRORURAL are truly significant for these villages. However, as the activities of the AGRORURAl primarily focus on soil conservation, irrigation and reforestation, they only meet part of the diverse needs of local farmers. To enable these farmers to be fully self-reliant, continuous as well as broad support is deemed to be essential, enlisting the collaboration of local governments and other government organizations. The poverty ratio in the Sierra has been showing a declining trend in recent years but no data is available to estimate the degree of contribution by the Project in this regard.[22]

(2) Impacts on Conservation of the Natural Environment

It was expected that the Project contributes to conservation of natural environment in the Sierra through soil conservation and reforestation. The AGRORURAL has been implementing such activities in small watersheds over a period of 20 years, positively contributing to the change of the natural landscape by conserving and increasing vegetation. A field visit to these watersheds revealed such landscapes as a series of reforestation sites (plantations) by the AGRORURAL over the hillsides as well as peak areas (Ancash) and scattered reforestation sites by the AGRORURAL over vast bare hillsides (Puno). In fact, areas where trees were planted in 13 regions targeted by the Project account for 35% of the gross reforestation area from 2001 to 2009.

[22] According to the National Institute of Statistics and Information, the national poverty ratio fell from 49% in 2004 to 35% in 2009. During the same period, the poverty ratio in the Sierra fell from 76% to 66%. This figure, however, was higher than those of the coastal area (41%) and the Amazon (57%). In 2009, some 10 million people were classified as poor in Peru, half of whom lived in the Sierra. No data on trends of poverty ratio by districts targeted by the Project were obtained.

Apart from reforestation work of which the contribution to the conservation of the natural environment is apparent, the benefitting farmers have reported other positive effects of the Project-related activities. These effects include a decline of soil erosion due to soil conservation works and improved conservation of the natural environment due to the retention of water in the soil, in turn resulting from infiltration ditches. However, the case study data indicates that the newly conserved area by the Project is less than 10% of the total area of these watersheds. These figures suggest that the Project produced only limited impacts on the conservation of the natural environment in these small watersheds.

Site not yet planted (Puno)

Planting of eucalyptus on a steep slope (Puno)

3.3.2 Other Impacts

While small warehouses, etc. were constructed to support tree nursery operations, all of the required land was offered by the benefiting farmers free of charge. Due to the fact that the activities under the Project are in small scale and aimed at conserving natural environment, negative impacts on the environment and other negative impacts, such as the forced resettlement of local residents were not observed.

Based on the above results, it is concluded that certain effects on environmental conservation and increased productivity is observed. Their expanse reached some 76% of the planned quantities. As no significant impacts were observed in terms of poverty alleviation and environmental conservation, the overall effectiveness and impacts of the Project are judged to be fair.

3.4 Efficiency (Rating: ②)

3.4.1 Outputs

(1) Target Areas and Target Villages

The initial scope of the Project covered 173 small watersheds in nine regions but was expanded to cover 243 small watersheds in 13 regions because of the following reasons.

- Following the completion of the loan disbursement for the Phase I Project which had been dogged by persistent delays, four target districts of the Phase I Project were added to the Phase III Project so that hitherto unavailable support for these areas could be achieved.

- New small watersheds were added to the existing target regions to rehabilitate damaged irrigation facilities in those areas hit by an earthquake in August, 2007.

(2) Planning and Implementation Processes

Through the work of the extension officers based at local offices of the AGRORURAL, farmers' organizations (such as soil conservation committees, reforestation committees and irrigation committees) are formed in each target village in due course. In many villages, part of the local farmers in the village joins these organizations to become beneficiaries of the Project. The AGRORURAL organizes various types of training for the beneficiaries. The AGRORURAL and farmers' organizations jointly examine the project budget, technical issues and requests of farmers while referring to the results of the resources diagnosis survey conducted by the AGRORURAL. They also prepare an annual project implementation plan. The Project provides materials (tools and materials) required for the construction of various facilities, seeds of improved crops and tree seeds and the farmers provide labour free of charge. Extension officers visit the villages once or twice a week throughout the project period to provide advice and guidance covering the wide contents of the Project.

(3) Outline of Project Outputs

The target figures of the Project plan at the time of appraisal were the result of inference based on the performance of previous phases. As such, they do not necessarily correspond to the actual outputs individually planned to reflect the concrete requests of local farmers in each village[23].

The implementation areas for the construction of terraces for the purposes of soil conservation and reforestation as a component of forest development were determined depending on the labour input of farmers as these activities were voluntarily conducted by the benefitting farmers who used tools and seeds provided by the Executing Agency. The suspension of loan disbursement for 30 months from November, 2003 which was the third year of the Project caused under-spending (84% on a yen base) of the project budget. This suspension created a situation where small-scale irrigation and other components requiring several years of planning and construction could not achieve the planned quantities. Meanwhile, in the case of some components, such as soil conservation and forest development, of which the performance depends on the labour input of farmers, the actual results exceeded the planned quantities. Table 1 compares the planned quantity with the achieved quantity for each type of output.

The main reasons for the discrepancy between the planned and actual figures for various outputs are listed below.

[23] In this comparison, the plan at the time of appraisal is considered to be an original plan. The plans for each village prepared after the commencement of the Project was not obtained.

- Compared to absorption terraces and infiltration ditches, the demands of farmers for slow formation terraces and the introduction of improved grass as well as improved crops were stronger because of (i) the relatively small labour input required by farmers and (ii) better prospects of improved productivity.
- The number of tree nurseries exceeded the planned figure because of villages in additionally targeted areas.
- The production quantity of seedlings far exceeded the planned figure because of a nationwide reforestation campaign which started in 2006.
- Small-scale irrigation was hardly implemented until 2006 because of financial constraints (as described later). Even when the work restarted, the actual performance was far below the planned level because of the necessity for fresh surveys, time constraints and other reasons. Half of the budget earmarked for this component was actually used for the rehabilitation of irrigation facilities in disaster-hit areas because of its urgency.
- Of the small-scale irrigation components, pressurised irrigation (with sprinklers) was introduced at many more sites than planned because its high water utilisation efficiency led to a strong demand for this system by farmers.
- Several types of equipment were additionally provided, including PCs and related equipment to improve the work efficiency of the Executing Agency and various instruments to improve the quality of the Project at the village level.

Participatory planting operations (Ancash, photos provides by AGRORURAL)

Table 1 Main Project Outputs (Original and Actual)

Components	Original	Actual	Remarks
Soil conservation • Absorption terraces • Slow formation terraces • Infiltration ditches • Installation of improved grass • Installation of improved crops	77,118 ha 5,300 ha 21,200 ha 31,800 ha 12,190 ha 6,628 ha	83,501 ha 4,120 ha 29,033 ha 17,735 ha 17,424 ha 15,189 ha	• Terraces: See 3.2.1(1) and Footnotes 12. Planting is often conducted along the contours of terraces for the purpose of ground reinforcement, frost protection and/or wind breaking. • Infiltration ditches: See 3.2.1(1) and Footnote 13. • Installation of improved grass and improved crops: Improved varieties of potatoes, maize, grass and others are introduced at farmland where terraces and/or infiltration ditches have been newly constructed with a view to improving both the vegetation and productivity.
Small-scale irrigation • Construction/improvement of irrigation channels • Pressurized irrigation (sprinklers) • Construction/improvement of reservoirs • Multi-purpose water supply • Small-scale dams • Special irrigation structures	 628 km 9 sites 264 sites 131 sites 24 sites 102 sites	 264 km 60 sites 28 sites 31 sites 0 sites 0 sites	• Irrigation channels: Gravity irrigation is conducted using some 40 cm wide concrete channels. • Pressurized irrigation (sprinklers): Water is conducted to farmland through pipes for irrigation using mobile sprinklers. The water utilisation efficiency of this system is higher than reliance on irrigation channels. • Multi-purpose water supply facilities: These are designed to distribute water for irrigation, household use and animals.
Forestry development • Tree nurseries • Production of forest tree seedlings • Plantations • Forest management • Forest protection	 120 sites 38,700,000 38,690 ha 8,200 ha 1,500 ha	 404 sites 72,100,000 38,884 ha 9,189 ha 6,389 ha	• Tree nurseries: Seedlings of local species as well as such exotic species as eucalyptus and pine are produced at village nurseries according to the climate and soil of each locality. • Plantations: Small to medium size plantations (mostly production forests) are created on public and private land along with the planting of terrace hedging. • Forest management and forest protection: See Footnote 11.
Small-scale watershed management	1 site	3 sites	• Many inputs are made in the form of studies, training and strengthening of organizations in small watersheds.
Small warehouse	530 sites	253 sites	• These warehouses are used to store seed potatoes and other agricultural inputs in an appropriate manner and are jointly managed by farmers.
Greenhouses	1,060 sites	399 sites	• These are designed to produce vegetables, etc. and are jointly managed by farmers.
Support for enterprise initiative	220 cases	312 cases	• Support is provided for farmers' groups which plan to start businesses involving processed dairy products, culture of trout, beekeeping and others.
Procurement of vehicles and other equipment	4x4 vehicles, motorbikes, etc.	Addition of PCs and various instruments	• 4x4 vehicles, motorbikes, PCs, peripheral equipment, instruments for water / soil analysis and other measuring instruments
Consulting services	Project management, technical assistance, auditing	Project management, technical assistance, auditing	• Project management and technical assistance by international consultants, auditing by local firms

3.4.2 Inputs

3.4.2.1 Project Cost

The actual spending of the Project was 6,287 million yen which was 84% of the originally planned cost of 7,449 million yen. The principal reason for this low project spending was the reduction of outputs despite the addition of new target areas and extension of the loan disbursement deadline because of the slow progress of the Project caused by the various reasons explained in 3.4.2.2 below[24]. Given the decrease of the outputs, the overall size of the project cost is judged to be reasonable.

Table 2 Project Cost (Original and Actual)

Item	Original (Unit: million yen)			Actual (Unit: million yen)				Total
				Type of Currency		Funding Source		
	Foreign Currency	Local Currency	Total	Foreign Currency	Local Currency	Yen Loan	Gov. of Peru	
Investment in Rural Development	0	5,030	5,030	3,889	1,878	4,093	1,678	5,767
Vehicles and Equipment	176	0	176	135	73	166	42	208
Consulting Services	140	30	170	225	7	253	59	312
Contingency	9	261	270	-	-	-	-	-
Administration Cost, etc.	0	960	960	-	-	-	-	-
Taxes	0	843	843	-	-	-	-	-
Grand Total	325	7,124	7,449	4,249	2,038	4,513	1,775	6,287

Notes: The actual figure for each component includes the management cost and taxes.

Foreign exchange rates: (At the time of appraisal) 1 N.Sol = 34.0 yen

(At the time ex-post evaluation) 1 N.Sol = 34.7 yen

Sources: Reference materials used for appraisal and the Project Completion Report

3.4.2.2 Project Period

The implementation period of the Project was 110 months from September, 2000 (signing of the loan agreement) to October, 2009, 143% of the originally planned period. The loan disbursement deadline was extended due to a substantial delay of project implementation, in turn caused by the reasons listed below.

- To maintain the balance of Peru's macroeconomy, the Ministry of Economy and Finance restricted external borrowing and the size of the domestic contribution to aid projects, resulting in a decline of domestic expenditure for public sector investment projects, including the Project.

[24] While the AGRORURAL intended to spend all of the remaining loan by the end of the extended disbursement period (October, 2009), the actual amount requested for disbursement in 2009 was below the planned amount, partly because it took a long time for AGRORURAL staff to become used to the new disbursement request procedure (see Footnote 26) and partly because much time was used for the preparation and approval of reports on expenditure, influence by frequent personnel reshuffling at local offices.

- Confusion caused by the possible merger of the PRONAMACHCS with another government body (Social Development and Compensation Fund: FONCODES)[25] as stipulated by government policy led to the temporary suspension of the execution of the FY 2003 budget for the Project.

- Following the comment made by the external auditor appointed for FY 2002 through FY 2004 that it was not possible to confirm the appropriateness of expenditure for the Project[26], disbursement of the yen loan was suspended for the soil conservation, irrigation and reforestation (plantation) components for 32 months from October, 2003 to May, 2006. There were several causes which are believed to have led to the suspension of loan disbursement. Firstly, the individual participation of as many as 1,380 farmers' organizations in the procurement procedure created a huge volume of project supervisory work for local offices of the executing agency. Secondly, the Phase I Project and Phase II Project, both of which required similar project supervisory work, were implemented simultaneously but separately. Thirdly, the frequent transfer of staff members and cuts of the budget and manpower significantly dented the implementation capacity of the executing agency since 2001.[27]

- The suspension of loan disbursement by the JBIC meant that the activities promised to farmers could not be implemented for a period of more than two years, damaging the relationship of trust between the PRONAMACHCS/AGRORURAL and farmers. In turn, this damaged relationship had an adverse impact on the implementation of soil conservation and planting activities in which the participation of farmers was crucial.

The Project included a consultancy service designed to assist the planned activities and management of the project budget. According to the AGRORURAL, the consultancy service at the early stage of the Project was not effective in solving problems which led to the suspension of loan

[25] The FONCODES was established in 1991 for the purpose of poverty alleviation and has since been engaged in the development of sanitation and economic infrastructure in the Amazon and Sierra.

[26] The audit report for FY 2002 pointed out that there were many cases where proper reports and evidence of Project-related expenditure were not submitted by local offices of the PRONAMCHCS to the head office. Recommencement of loan disbursement was eventually recommenced after the implementation of measures designed to prevent the recurrence of such malpractice. These measures included review of the accounting management rules, increase of the staff strength, improvement of the monitoring system and implementation of suitable training by the PRONAMACHCS. The JICA demanded the acceptance of the new disbursement request procedure as one of the conditions for the restart of loan disbursement. To be more precise, a request for disbursement from May, 2006 onwards must be based on the actual amount of investment executed and certified by a report on expenditure for every expenditure made. Previously, the transfer of funds from the head office of the PRONAMACHCS to a local office was considered to constitute the execution of actual investment and disbursement for an amount equivalent to the transferred funds could be requested.

[27] After the change of the government in 2001, many senior staff members left the PRONAMACHCS. Their replacements often lacked suitable experience or capability while the transfer of the work was not necessarily sufficiently conducted. Many front-line extension officers were also replaced. Having subsequently experienced much confusion surrounding the issue of a merger between the PRONAMACHCS and another government body, the Ministry of Agriculture and the Ministry of Economy and Finance rapidly reduced the budget allocation for the PRONAMACHCS of which the performance had declined. At the same time, the manpower level of the PRONAMACHCS was reduced and its local offices were integrated. As a result, the budget amount for each local office of the PRONAMACHCS was halved.

disbursement.[28] After the recommencement of loan disbursement, the consultancy service was much more effective. One example is the clear presentation of concrete measures to improve project supervision together with on-site guidance.

As explained above, the actual project implementation period far exceeded the original plan and was disproportionate to the decrease of outputs and other aspects of the Project.

3.4.3 EIRR (Economic Internal Rate of Return)

At the time of appraisal, the EIRR of the Project was estimated to be 13% based on the assumption that the benefit of the Project would be increased income for benefitting farmers through increased agricultural production and reforestation. Recalculation of the Project's EIRR was not conducted as part of the present ex-post evaluation because of the unclear details of the basis for calculation at the time of appraisal and the lack of actual representative data for productivity improvement and production increase under the Project.

Based on the above, the efficiency of the Project is evaluated to be fair because of the much longer project period than planned even though the project cost was within the planned cost.

3.5 Sustainability (Rating:②)

3.5.1 Structural Aspects of Operation and Maintenance

The facilities for soil conservation, reforestation and irrigation are transferred to farmers for their collective or individual operation and maintenance. Tree nurseries are operated by the conservation committee of individual villages while irrigation facilities are operated by their respective irrigation committees. In the case of soil conservation works and plantations, their operation and maintenance are conducted by individual farmers as well as jointly by communities. In principle, irrigation facilities are maintained by the benefitting farmers. When the necessary repair work is judged to be beyond the financial and technical capabilities of farmers, financial assistance is requested from the local government or another suitable body.

After the transfer of facilities to farmers, local offices of the AGRORURAL dispatch extension officers to check the operating conditions of the facilities every week or so. If necessary, these officers provide technical assistance. At some villages, local offices of the AGRORURAL have been continually providing seeds and plastic bags for seedling production within their budget. As described later, however, the substantial budgetary cuts at the AGRORURAL in recent years have led to the termination of such assistance for remote villages originally targeted by the Project and villages where the farmers have been found to be not very proactive. Extension officers may visit these villages once every one or two months, but they only provide advice as there is no budget for material assistance. The field survey discovered villages where the number of participating farmers and level of activities declined after the termination of the physical and technical assistance by the AGRORURAL.

[28] The terms of reference for the consultancy service did not include the assignment of an expert on financial management.

To compensate for the shortage of resources for various development activities, the AGRORURAL has been actively trying to establish a meaningful cooperative relationship with local public bodies (at the regional, district and municipal levels). These local public bodies provide manpower, tree seeds and others in agreement with the AGRORURAL. Such agreements for cooperation were signed by 17 regions, 20 districts and 376 municipalities in 2009 and by four regions, 20 districts and 385 municipalities in 2010.

3.5.2 Technical Aspects of Operation and Maintenance

The routine maintenance of the soil conservation works, plantations and small-scale irrigation facilities constructed under the Project does not require advanced technical skills. The beneficiary survey revealed that the benefitting farmers and farmers' organizations responsible for the maintenance work generally understand the necessity for maintenance and the maintenance methods due to their training and participation in the Project. The same survey found a strong request by farmers for training on fertiliser application and the marketing of agricultural products in Ancash and fertiliser application and the production of improved grass in Puno, though the subject matter is not directly related to the operation and maintenance of the facilities constructed under the Project.

While the AGRORURAL has steadily built up its technical capability through a series of activities in the Sierra over many years, some of its capability has been lost due to the outflow of experienced personnel following the change of the government in 2001. Despite this setback, the AGRORURAL has been continuing its efforts to develop its capability through the training of extension officers and other activities.

3.5.3 Financial Aspects of Operation and Maintenance

Since the transfer of the new facilities to farmers, the AGRORURAL has not provided any special funding for these facilities. Therefore, farmers have been operating and maintaining these facilities through their individual and/or collective efforts. Meanwhile, the AGRORURAL has continued project activities in some target villages and has been funding primarily the production of tree seedlings.

When funding is required for the repair of irrigation facilities, the cost is charged to the benefitting farmers if necessary. If the cost is beyond the financial capability of these farmers, a request for external assistance is made to a local public body, etc. As far as the findings of the field survey are concerned, there are no cases of an acute funding shortage even though the collection of repair funds is hardly a regular practice.

The AGRORURAL provided guidance for the establishment of a communal fund (revolving fund) called FONCAPCO[29] using seeds (seed potatoes, etc.) supplied under a component (introduction of improved crops) of the Project. Not many villages are found to have been operating this fund effectively. In fact, the fund has disappeared in many villages, presumably because of the loss of seed

[29] Members of FONCAPCO borrow improved seeds as a capital and repay them after the harvest.

potatoes due to cold weather and/or the failed succession of operation following the departure of the person responsible for the fund. According to the AGRORURAL, the repayment ratio in 2006 was 64%. The beneficiary survey found that the cultivation area using an improved variety remains at 40% of the entire area for grass and some 30% for potatoes.

The production of forest tree seedlings requires the purchase of seeds, plastic bags and other materials unless seeds or coppice shoots are obtained from adult trees. At some villages which still receive assistance from the AGRORURAL or villages which can receive the assistance of a local public body, etc., the production of seedlings continues for some local species as the farmers can collect the seeds, etc. on their own initiative.[30] At those villages where the beneficiary survey was conducted, the current production volume of seedlings has dropped to approximately half of the volume during the project period and the ratio of local species has increased.

According to the AGRORURAL, its budget has substantially declined since FY 2009 when the Project was completed. This is in line with the general decline of budget allocation for central government ministries, including the Ministry of Agriculture, as a result of the on-going decentralisation policy. The operating guidelines of the AGRORURAL at the time of its establishment in 2008 emphasised the marketing of agricultural products, processing of agricultural products and strengthening of the international competitiveness of Peruvian agriculture but did not clearly state support for the poor and the conservation of natural resources by means of soil conservation and reforestation in the policy menu, resulting in little budget allocation for follow-up activities for the Project.[31] However, the revised operating guidelines to be introduced in FY 2012 are scheduled to include clear reference to the need for support for the extremely poor farmers and also for the conservation of natural resources, suggesting the restoration of balanced budget allocation to support the said activities.

Table 3 Actual Budget Execution by the AGRORURAL

(Unit: million N.Sol)

FY	Amount Allocated	Amount Executed	Extermal Assistance in the Amount Executed
2009	301.9	270.7	71.1
2010	186.1	142.1	29.7
2011	163.5	92.7*	23.5*

*Amount executed up to 8th November, 2011.

Source: AGRORURAL

[30] In the case of some local species, seedlings are produced from either collected seeds or cuttings. While there are villages where seeds are collected from adult trees of pine (exotic species), no reproduction is taking place in this way with eucalyptus trees planting under the Project as they have not yet reached the age of producing seeds.

[31] According to former PRONAMACHCS staff members who now work for the AGRORURAL and other sources, the lack of opportunities for senior technical staff of the PRONAMACHCS to be involved in the process of formulating the operating guidelines for the AGRORURAL is a remote cause of the unbalanced budget allocation.

3.5.4 Current Status of Operation and Maintenance

The findings of the case studies indicate that even though the maintenance situation of the new facilities is not perfect, these facilities are generally performing their intended functions. The beneficiary survey found that some 95% of the soil conservation works on private land and some 85% of those on common land are functioning and that almost all of this land is used for farming. No loss of the soil conservation function has been observed with most of the soil conservation works.

The maintenance of soil conservation works is the responsibility of farmers but this requires much labour (and time). As farmers tend to give priority to other activities directly linked to production or the earning of cash, the maintenance of soil conservation works appears not to be sufficiently conducted. The maintenance of infiltration ditches located on distant common land in particular appears to have been neglected because of the need for large communal input. Meanwhile, some wealthier farmers have continued to create slow formation terraces using their newly acquired knowledge, skills and agricultural tools under the Project.

No specific problems have been observed regarding the maintenance of the newly planted seedlings. In the case of planting on pasture land, the seedlings are often protected by stone walls to prevent damage by feeding animals. While the thinning has not taken place at eucalyptus plantations after coppicing, this lack of thinning does not pose a serious problem as long as the aim is to produce timber (supporting material for construction works) and firewood.

No major problems are observed in regard to the maintenance of irrigation facilities within the scope of the field survey.[32]

3.5.5 Sustainability Summary

While a cooperative relationship is being established between the AGRORURAL and local public bodies, there is slight concern regarding the institutional aspect because of the limited manpower and budget of the AGRORURAL. Because of the substantial decline of the budget allocation for the AGRORURAL in recent years, weak performance of FONCAPCO (for the continued use of improved varieties) and the declining production volume of forest tree seedlings, there is also a slight concern on financial aspects.

Based on the above, the sustainability of the Project effect is judged to be fair because some problems have been observed in terms of structural and financial aspects.

4. Conclusion, Recommendations and Lessons Learned

4.1 Conclusion

This Project was implemented for the purpose of increasing the agricultural productivity in Peru's Sierra where poverty is prevalent while trying to ensure environmental conservation. This purpose was consistent with the development policies of the Government of Peru and there was an urgent need for

[32] An ex-post evaluation study on a similar project by the World Bank indicated that the operating ratio of irrigation facilities is around 85%.

this type of project to be implemented in Peru. It also conformed to Japan's ODA policy and its overall relevance was high. Only 84% of the project budget was executed, partly because of the suspended disbursement of the Japanese ODA loan and the output in terms of irrigation facilities did not reach the original target. On the other hand, because of the extension of the loan period to accommodate the longer implementation period than planned, the efficiency of the Project is evaluated to be fair.

In total, some 48,000 households in 1,683 villages benefited from the Project. Some positive impacts have been made on the economic activities and daily lives of the benefited farming households through improved levels of environmental conservation and agricultural productivity. As the achievement rate of the planned target of the Project in terms of the area coverage is estimated to be 70 – 80%, the effectiveness of the Project is judged to be fair. There is some concern regarding future funding for the executing agency and the sustainability of communal fund management as well as tree seedling production by the farmers who benefited from the Project. While, although the maintenance situation of the newly constructed facilities is not perfect, their functions are generally sustained. Based on the above findings, sustainability of the Project is fair. In light of the above, the Project is evaluated to be partially satisfactory.

4.2 Recommendations

4.2.1 Recommendations to AGRORURAL

- Given the importance of providing assistance for villages in the Sierra and the usefulness of the know-how accumulated by AGRORURAL staff through experience at the former PRONAMACHCS over many years, it is essential that the AGRORURAL further clarify the policy menu designed to assist villages in the Sierra together with the allocation of the necessary budget.

- At present, the AGRORURAL has hardly any data which allows it to verify and present the impacts of its own projects implemented in the Sierra. The AGRORURAL should make more efforts regarding systematic collection of data on project effects, ex-post evaluation and basic research so that effective public investment projects in the Sierra can continue.

- Against the background of increasing budget allocation for local governments in line with the decentralisation policy, it will be necessary for the AGRORURAL to shift its emphasis from the implementation of investment projects to technical assistance for local governments. It is highly desirable for the AGRORURAL to start the examination of new approaches, such as the preparation of educational and training materials for the heads, senior staff and ordinary staff members of local governments and the gathering and compilation of vital data (including ex-post evaluations) which is essential for the preparation of the said materials.

4.2.2 Recommendations to JICA

There is no specific recommendation to JICA in connection with the ex-post evaluation of the Sierra - Natural Resources Management and Poverty Alleviation Project (III)

4.3 Lessons Learned

- The suspension of loan disbursement can significantly affect the implementation and effects of a project in some cases. In case of the Project, although the judgement to suspend the disbursement was appropriate, the suspension significantly affected the Project as it considerably delayed the construction of irrigation facilities and badly dented the willingness of local residents to participate in the Project. To avoid the occurrence of such suspension, it is essential to take the necessary measures, including careful examination of the supervisory system of the project implementing body and contents of the consulting service, as early as the project planning stage. Even if the suspension of loan disbursement is inevitable for one reason or another, maximum efforts must be made to minimise the negative impacts of such suspension. These may include close discussion with concerned parties including the executing agency and also consideration to the possibility of additional support for a prompt solution of problems which have led to the suspension of loan disbursement.

- In the case of the present Project, after the integration of the initial executing agency to the AGRORURAL, the policy menu developed by the former PRONAMACHCS was dismantled, resulting in the drastic curtailment of both the manpower and budget. In turn, this adversely affected the sustainability of the Project. When the integration of an executing agency with another body is planned, due consideration must be given to maintaining the continuity and consistency of policies while listening to the opinions of technical staff of the executing agency prior to and after such integration.

Comparison Between the Original Plan and the Actual Results

Item	Components	Original Plan	Actual Results
Outputs	(1) Soil Conservation		
	• Absorption terraces	5,300 ha	4,120 ha
	• Slow formation terraces	21,200 ha	29,033 ha
	• Infiltration ditches	31,800 ha	17,735 ha
	• Installation of improved grass	12,190 ha	17,424 ha
	• Installation of improved crops	6,628 ha	15,189 ha
	(2) Small-Scale Irrigation		
	• Construction/Improvement of Irrigation Channels	628 km 124 sites	264 km 0 site
	• Special irrigation structures	9 sites	60 sites
	• Pressurized irrigation	264 sites	28 sites
	• Construction/Improvement of Reservoirs	131 sites	31 sites
	• Multi-Purpose Water Supply	24 sites	0
	• Small-Scale Dams		
	(3) Forestry development		
	• Nursery for Forest Trees	120 sites	404 sites
	• Production of Forest Tree Seedlings	38,700,000	72,100,000
	• Plantations	438,690 ha	38,884 ha
	• Forest Management	8,200 ha	9,189 ha
	• Forest Protection	1,500 ha	6,379 ha
	(4) Small-Scale Watershed Management	1 site	3 sites
	(5) Small Warehouses for Agricultural Inputs	530 sites	253 sites
	(6) Greenhouses	1,060 sited	399 sites
	(7) Support for Enterprise Initiative	220 cases	312 cases
	(8) Procurement of Vehicles, AV Equipment and Information Communication Equipment		PCs and various instruments were added
	(9) Natural Resources Studies		
	• Micro-watershed Studies	173 studies	0 study
	• Communal Agrarian Plan	1,060 plans	1,395 plans
	(10) Workshop/Training to Strengthen Rural Organizations		
	• Workshop/Training to Strengthen the Organization of the Project Executing Agency	119 times	83 times
	• Workshop/training of rural organizations	339 times	234 times
	- Enterprise Development	564 times	956 times
	- Formation of Micro-watershed Committees	645 times	1,984 times
	- Rural Extension		
	(11) Consulting Service		
	• Project Supervision		
	• Audit		
Project Period		September,2000 to January, 2007 (77months)	September, 2000 to October, 2009 (110 months)
Project Cost	• Japanese ODA Loan Portion	5,588 million yen	4,513 million yen
	• Executing Agency	1,861 million yen	1,775 million yen
	• Total	7,449 million yen	6,287 million yen
	Exchange Rate	S/. 1 = 34.0 yen (as of July 1998)	S/. 1 = 34.7 yen (average between September, 1999 to September 2006)