

Country Name	Project for Strengthening Integrated Management of Yguazú Lake Watershed
Republic of Paraguay	

I. Project Outline

Background	<p>The Lake Yguazú watershed (503,300ha) in Paraguay has been important for stable power supply in the country, as it has been used as a regulating reservoir for the Acaray hydropower plant. On the other hand, in the watershed, immigrants began large-scale agricultural development in the 1970s, and a vicious cycle was created in which deforestation and traditional agriculture (slash-and-burn agriculture, etc.) caused by the expansion of farmland resulted in the devastation of the watershed, and the associated poverty brought about the further deforestation. There was a concern that the vicious cycle would lead to sediment deposition in the Lake Yguazú, which would reduce the power generation volume in the future. Watershed management was urgently needed to improve that situation so that the capacity of the Acaray hydropower plant could be utilized at the maximum level.</p>														
Objectives of the Project	<p>Through development of reforestation and forest rehabilitation techniques, establishment of the multidisciplinary team in the National Administration of Electricity (ANDE) and municipality-level platforms, etc. in the target sites of the Yguazú Lake watershed, the project aimed at strengthening ANDE's institutional mechanism for watershed management, thereby contributing to the appropriate land use management.</p>														
	<p>1. Overall Goal: Appropriate land use is realized through watershed management in Yguazú Lake watershed. 2. Project Purpose: Institutional mechanism is strengthened for the management of Yguazú Lake watershed.</p>														
Activities of the project	<p>1. Project site: Six Municipalities in Caaguazú Department (Nueva Toledo, R. A. Oviedo, J. D. Ocampos, D. J. Eulogio Estegarríbia, Mariscal F. S. Lopez, and Tembiaporá) and four Municipalities in Alto Parana Department (Yguazú, D. J. L. Mallorquín, J. E. O'Leary, and Minga Guazú) 2. Main activities: Establishment of the multidisciplinary team in ANDE and the technical committee, municipality-level platforms, development of the annual plan of watershed management activities, development of reforestation and forest rehabilitation techniques, training of ANDE staff, support for residents' watershed management activities, etc. 3. Inputs (to carry out above activities)</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Japanese Side</td> <td style="width: 50%;">Paraguayan Side</td> </tr> <tr> <td>1) Experts from Japan: 9 persons</td> <td>1) Staff allocated: 16 persons</td> </tr> <tr> <td>2) Trainees in Japan: 20 persons</td> <td>2) Land and facilities: Office space, etc.</td> </tr> <tr> <td>3) Trainees in the third country (Panama): 33 persons</td> <td>3) Local cost: Fuel, vehicle maintenance cost, office maintenance cost, etc.</td> </tr> <tr> <td>4) Trainees in the third country (Honduras): 8 persons</td> <td></td> </tr> <tr> <td>5) Equipment: Vehicles, boats, outboard motors, mowers, water level gauges, etc.</td> <td></td> </tr> </table>			Japanese Side	Paraguayan Side	1) Experts from Japan: 9 persons	1) Staff allocated: 16 persons	2) Trainees in Japan: 20 persons	2) Land and facilities: Office space, etc.	3) Trainees in the third country (Panama): 33 persons	3) Local cost: Fuel, vehicle maintenance cost, office maintenance cost, etc.	4) Trainees in the third country (Honduras): 8 persons		5) Equipment: Vehicles, boats, outboard motors, mowers, water level gauges, etc.	
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Project Period	August 2013 to July 2017	Project Cost	(ex-ante) 356 million yen, (actual) 316 million yen												
Implementing Agency	National Administration of Electricity (ANDE)														
Cooperation Agency in Japan	None.														
Related Project	<p>Loan: Yguazú Hydropower Station Construction Project (2015) Other donor: Rehabilitation and Modernization Project of Acaray Hydropower Station (2019) (Inter-American Development Bank)</p>														

II. Result of the Evaluation

< Special Perspectives Considered in the Ex-Post Evaluation >

- Indicator 2 of the Project Purpose was to measure the level of understanding of the stakeholders of the developed watershed management plan. In the ex-post evaluation, the level of understanding of the plan by the stakeholders was not confirmed, but the status of utilization was confirmed.
- For Indicator 3 of the Project Purpose (securing budget for the watershed management plan), the budget allocation status was confirmed from the financial aspect of sustainability in the time of ex-post evaluation, but not as a continuation of the project effects.

1 Relevance
<p><Consistency with the Development Policy of Paraguay at the time of Ex-ante Evaluation></p> <p>The "Socio-Economic Strategic Plan" (2008-2013) aimed at the equitable livelihood improvement of all citizens, and in particular to improve social services for the poor. One of the strategic objectives was "diversification of production structure", which aimed to "diversify the production structure while being environmentally friendly and fully utilizing existing energy and human resources." Thus, the project was consistent with the development policy of Paraguay at the time of ex-ante evaluation.</p> <p><Consistency with the Development Needs of Paraguay at the time of Ex-ante Evaluation></p> <p>In the Lake Yguazú watershed, large-scale farming was started by immigrants in the 1970s, and a vicious cycle of deforestation and traditional agriculture caused by the expansion of farmland, resulting in the devastation of the watershed, poverty, and further expansion of farmland. There was a concern that this vicious cycle would lead to sediment deposition in the Lake Yguazú, which would decrease the amount of power generation in the future. In this regard, the project aiming at the appropriate watershed management was consistent with these development needs of Paraguay at the time of ex-ante evaluation.</p> <p><Consistency with Japan's ODA Policy at the time of Ex-ante Evaluation></p> <p>The basic principle of the "Country Assistance Policy for the Republic of Paraguay" (2012) was to achieve "sustainable economic and social development without disparities by improving the quality of life of the poor and enhancing social services," and priority areas were</p>

reduction of economic and social disparities and sustainable economic development. Regarding the reduction of disparities, support for the diversified needs of small farmers were targeted, while development and enhancement of the economic and social infrastructure were aimed at for sustainable economic development. Thus, the project was consistent with Japan's ODA policy at the time of ex-ante evaluation.

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Status of Achievement for the Project Purpose at the time of Project Completion>

The Project Purpose was achieved by the time of project completion. The Watershed Management Department was established in ANDE Technical Division (Indicator 1). In addition, the multidisciplinary team to facilitate activities related to the "Yguazú Lake Watershed Management Plan" was established by the President's order, and meetings were held. The "Yguazú Lake Watershed Management Plan" was approved by the President's resolution. The plan was explained to the stakeholders such as relevant departments of ANDE, ministries and Municipal Mayors, and it was judged that 75% of the stakeholders understood the plan (Indicator 2). However, it was found that the understanding level of the municipality stakeholders was not much high while ANDE officers showed the high understanding. At the time of project completion, ANDE explained that they considered to secure the budget planned in the watershed management plan through self-financing and support from domestic and international donors (Indicator 3). According to ANDE, the budget for reforestation and afforestation, hydrology, assignment of technicians and staff for community awareness raising, and procurement of equipment such as water level gauges would be added to the budget request for the financial year of 2018 and that it would be disbursed the following year. In addition, as an approach to link watershed conservation activities with income generation, ecotourism was introduced using existing knowledge (livestock rearing and rural experience) and lifestyles (handicrafts, dance) that are commonplace to local residents, leading to cash income.

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

The project effects have continued. The "Yguazú Lake Watershed Management Plan" has continuously been an official document of ANDE and has been incorporated into the Operation Manual of ANDE. The multidisciplinary team formed during the project implementation was dismantled, but the Watershed Management Department under the Environmental Management Directorate has worked for implementing the watershed management plan in collaboration with other sections. ANDE has carried out activities including tree planting, weed control, and nursery maintenance¹), etc. based on the annual plan, after confirming the land properties. Reforestation activities have been conducted by the green space cleaning staff under coordination of the Watershed Management Department. ANDE also organized training workshops for local residents on environmental conservation including soil management in three municipalities from 2018 to 2021 based on an annual plan (municipalities of Mallorquín, O'Leary, and Yguazú).

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

The Overall Goal has been achieved by the time of ex-post evaluation. The watershed management activities based on the "Yguazú Lake Watershed Management Plan" have been continuously implemented (Indicator 1). As shown in the table below, results of the watershed management activities have been confirmed in six municipalities. The municipality-level platform has served as the base for the implementation of the activities, and the activities have been carried out in collaboration with other municipality-level platforms, schools, Municipality Government, agricultural cooperatives, and Japanese Associations. These watershed management activities have been annually monitored (Indicator 2).

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

Several positive impacts have been confirmed. First, the local residents (teachers, members and leaders of women's groups that hold vegetable markets, etc.) have taken initiatives in implementing the activities of the watershed management plan, which has led to a change in the awareness of the local residents. This has also led to the participation of many women in the activities. As part of the environmental education at the school, evaluations have been conducted for the students, and it has been confirmed through the evaluations that the students have raised awareness of the importance of the environment. Second, ANDE has made briefings to municipality mayor and others based on the "Manual for the Establishment of Municipality-level Platforms" developed by the project, in order to provide opportunities where relevant organizations and residents in municipalities located in the watershed would recognize the importance of the watershed management and make actions. As a result, platforms were newly established in two municipalities by the municipality decree in 2018 after the project completion (Municipalities of Mariscal F. S. Lopez and D. J. Eulogio Estegarríbia).

<Evaluation Result>

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

Achievement of the Project Purpose and Overall Goal

Aim	Indicators	Results
(Project Purpose) Institutional mechanism is strengthened for the management of Yguazú Lake watershed.	1. The section for watershed management which leads the watershed management plan within ANDE.	<u>Status of achievement: Achieved (Continued).</u> (Project Completion) • The Watershed Management Department was established under the Technical Directorate. (Ex-post Evaluation) • The Watershed Management Department under the Environmental Management Directorate of ANDE has taken responsibility for the watershed management plan.
	2. 70% of the stakeholders such as the officers of relevant sections of ANDE, Ministries and Agencies, municipalities mayors understand the contents of the elaborated "Yguazú Watershed Management	<u>Status of achievement: Achieved (Continued).</u> (Project Completion) • 75% of the stakeholders scored more than 60 points (understood as the satisfactory understanding level) in the oral examination on the watershed management plan. (Ex-post Evaluation)

¹ Seedling cultivation, ant control, use of bokashi and niric acid.

	Plan.”	<ul style="list-style-type: none"> The “Yguazú Lake Watershed Management Plan” has been regarded as an official document of ANDE and incorporated into the Operation Manual of ANDE.
	3. Progress of the activities for allocating budgets necessary for the implementation of the “Yguazú Watershed Management Plan” at ANDE.	<p><u>Status of achievement: Achieved (Continued)</u> (Project Completion)</p> <ul style="list-style-type: none"> It was considered by ANDE that the budget would be allocated for the planned activities and experts to achieve the goals set in the watershed management plan from 2019. ANDE was planning its revenue and financial support from the domestic and international donor agencies. <p>(Ex-post Evaluation)</p> <ul style="list-style-type: none"> Refer to the financial aspect of sustainability.
(Overall Goal) Appropriate land use is realized through watershed management in Yguazú Lake watershed.	1. Watershed management activities are implemented in a sustainable way based on the “Yguazú Watershed Management Plan.”	<p><u>Status of achievement: Achieved.</u> (Ex-post Evaluation)</p> <ul style="list-style-type: none"> The following activities have been implemented based on the watershed management plan. <ul style="list-style-type: none"> ✓ Planting trees in public areas, conducting workshops for local residents (forestry, waste management), constructing a furnace to produce pyroligneous acid, cleaning up the watershed (J. L. Mallorquín) ✓ Constructing a furnace to produce pyroligneous acid, tree planting, conducting the environmental education, implementing workshops on water and tree planting at school (J. E. O’Leary) ✓ Conducting workshops for local residents (efficient use of water, forest, and electricity), cleaning up and reforestation near the watershed (Yguazú) ✓ Conducting workshops for local residents (watershed conservation), reforestation and cleaning in public areas and near watersheds (J. D. Ocampos) ✓ Sandbagging, forest and water management, and reforestation in the conservation area (Mariscal F. S. Lopez) ✓ Conducting workshops for schools (water cycle and protected areas) (D. J. Eulogio Estegarríbia)
	2. ANDE monitors the implementation of the “Yguazú Watershed Management Plan,” and carries out the revision and make recommendations to the relevant institutions at the central level.	<p><u>Status of achievement: Achieved.</u> (Ex-post Evaluation)</p> <ul style="list-style-type: none"> ANDE has monitored the implementation of the watershed management plan each year. As of the time of ex-post evaluation, there was no necessity for the revision. ANDE has submitted advices and comments to the Technical Committee at the central level (Ministry of Environment and Sustainable Development, National Forestry Institute, Ministry of Agriculture and Livestock, and Technical Secretariat for Economic and Social Development Planning) on the implementation of the annual plan activities of the watershed management plan.

Source: Project Completion Report and information provided by ANDE.

3 Efficiency

Both of the project cost and period were within the plan (ratio against the plan: 89% and 100%, respectively). Outputs were produced as planned. Therefore, the project efficiency is high.

4 Sustainability

<Policy Aspect>

One of the activity pillars has been poverty reduction and social development in the “National Development Plan” (2014-2030), and watershed management of Yguazú Lake has been relevant with two of the strategic objectives that are participatory regional development and appropriate and sustainable residential areas.

<Institutional/Organizational Aspect>

Since ANDE was reorganized in 2019, the Watershed Management Department of the Environmental Management Directorate has taken the initiative in the Watershed Management Plan. It has worked in collaboration with the Property Management Division, the Ownership and Easement Office, and the Topography Management Division. In September 2020, the Watershed Management Department moved its office to Alto Paraná Department, near Lake Yguazú, to allow for quicker response. ANDE has continued to monitor sedimentation, soil erosion, and water levels, and used the data to identify and improve problems. The technical committee at the central level for collaboration on the watershed management of Yguazú Lake has continued its meetings, but as of the time of ex-post evaluation it was temporarily suspended as a precautionary measure against the COVID-19 pandemic. Municipality-level platforms have continued in three of the five municipalities established during the project period. Clear reasons of non-continuity in two municipalities could not be confirmed. ANDE has planned to survey the status of municipalities that have stopped the platform and share good practices from other municipalities in FY2021.

<Technical Aspect>

According to the Director of the Environmental Management Directorate, ANDE staff has maintained the knowledge and skills necessary for the activities of the watershed management of Yguazú Lake, such as reforestation and vegetation recovery (including soil conservation), participatory development, and survey of sediment and lake shore erosion. New staff members have received training from the Environmental Management Directorate and have conducted activities related to watershed management step by step. In addition, the Training Department of the Professional Development Department of the Human Resource Directorate has planned and implemented the annual training plan based on the requests from the sections including the Watershed Management Department. Manuals developed by the

project ("Watershed Management Manuals" and "Municipality-level Platform Establishment and Operation Manual") have been used for training and as reference materials.

<Financial Aspect>

ANDE has been financed by its own resources from the electricity tariff and also by financial support from external agencies. However, the budget is not sufficient for further development of the activities.

<Evaluation Result>

In the light above, there have been issues in the institutional and financial aspects. Therefore, the sustainability of the effects is fair.

5 Summary of the Evaluation

The Project Purpose was achieved, and the project effects have continued. The "Yguazú Watershed Management Plan" was developed, and the responsible section was established within ANDE. Since the time of project completion, technical committee meetings at the central level and municipality-level platforms have been sustained, and activities based on the watershed management plan have been implemented. Regarding sustainability, there has been issues in institutional/organizational aspect and financial aspect, but there was no issue in policy and technical aspects..

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

III. Recommendations & Lessons Learned

Recommendations for Implementing agency:

- It is recommended to introduce activities for diversifying income sources supported by the project as good practices which were combined to the environmental protection at the technical committee meetings and diffuse them to other areas.
- It is recommended to further support local residents' activities for diversifying income sources for reducing deforestation near Yguazu Lake. It is desirable to work with local residents for selling local products and folk crafts produced by small farmers in eco-friendly activities, and presenting their activities at the tourist information center opened at the Pikypo Park in Yguazú Municipality in 2016, and at the Circuito Vivencial del Mundo Guaraní.

Lessons Learned for JICA:

- Although ANDE has not had much experience in implementing projects directly with local residents, the following factors contributed to the success of the participatory project. First, JICA experts acted as facilitators to support ANDE to lead the process of planning, implementation, and monitoring of the project while coordinating with other ministries and agencies. This fostered not only project know-how but also ownership. Second, instead of directly reaching out to the local residents, participation in the activities was promoted through the local government (county government office), which led to their better understanding of environmental conservation as an issue of their own community. Third, by linking the existing knowledge and lifestyles of local residents to environmental conservation as an income-generating activity, the understanding and motivation for environmental conservation was enhanced. Thus, when an implementing agency that does not have a lot of experience implements a project with the participation of local residents, it is important for the Japanese experts to act as facilitators, not standing out, in the design of the project, to utilize existing organizations as a medium, and to take an approach which brings benefits to the beneficiaries.



Development of the Annual Activity Plan of FY2021 at Yguazú Municipal Platform



Technical workshop on the soil conservation