

Water Improvement Plan for Lake Ypacarai and Its Basin



Project Sites San Lorenzo

1. Background of Project

Lake Ypacarai, which is located in the central part of Paraguay, is a major national tourist attraction. However, in recent years, industrial wastewater and household effluent is deteriorating the water quality of both inflowing rivers and the lake. This has been negatively impacting on the tourism industry and the living environment of the local community, provoking national concern towards the improvement of water quality. Japan provided a development study "The study on Basin Water Pollution Control Plan for the Lake Ypacarai and its basin" (1988 – 1989) and dispatched individual experts (1995 – 1998) in response to Paraguay's requests for cooperation. The government of Paraguay recently requested Team Dispatch of Experts to further develop the results attained in the previous cooperation programs and to improve the water quality of the lake.

2. Project Overview

(1) Period of Cooperation

1 June 1998 – 31 May 2001

(2) Type of Cooperation

Experts Team Dispatch Program

(3) Partner Country's Implementing Organization

Environment and Sanitation Service (SENASA)

(4) Narrative Summary

1) Overall Goal

The water quality of Lake Ypacarai Basin is improved.

2) Project Purpose

The system of SENASA for water quality control and improvement of Lake Ypacarai Basin is enhanced.

3) Outputs

- a) The current condition of water quality is understood
- b) A monitoring system is established.
 - The counterpart is able to establish an environmental monitoring plan.
 - Monitoring equipment is used and maintained appropriately.

- Monitoring techniques (data analysis, data management, etc.) of the counterpart are improved.
 - Monitoring system improvement (plan, technology, equipment) manual is prepared.
- c) A water quality improvement plan is established.
 - d) A water quality standard which aims to establish a legal framework for aquatic pollution control is considered.
 - e) The pollutant sources are provided with guidance to improve the quality of discharged water
 - f) The local community is informed of the current condition of water pollution and the need for improvement.

4) Inputs

Japanese Side

Long-term experts	2
Short-term experts	9
Trainees received	3
Equipment	28 million yen
Local cost	8 million yen

Paraguayan Side

Counterparts	20
--------------	----

3. Members of Evaluation Team

Team Leader:

Yuhei INAMORI, Executive Researcher, National Institute for Environmental Studies, Japan Environment Agency

Water Quality Improvement:

Sumio HIGUTI, Chief Researcher, Nagano Research Institute for Health and Pollution

Evaluation Planning:

Naotaka YAMAGUTCHI, Staff, South America Division, Regional Department III, JICA

Evaluation Analysis:

Hiromi OSADA, IC Net Ltd.

4. Period of Evaluation

16 November 2000 – 25 November 2000

5. Results of Evaluation

(1) Relevance

Lake Ypacarai plays a crucial role in landlocked Paraguay as a source of drinking water, tourism and fishery resources. For this reason, water quality improvement of Lake Ypacarai is an issue of national concern, which the government relates to "the Guarantee of the National Health" in its constitution. There is increasing awareness at the administrative level with regard to conservation of the aquatic environment. In addition, this project aims to establish the foundation for a system that contributes towards water quality improvement of the Lake by transferring engineering technologies for aquatic research and analysis and administrative guidance. This aim is consistent with both the capacity and the needs of SENASA. Accordingly, it should be evaluated that the project has a high degree of relevance.

(2) Effectiveness

The execution of the project accomplished the establishment of the analytic technologies and the preparation of various technological manuals. SENASA carries out monitoring according to the monthly plan it designed itself obtaining aquatic quality data regularly every month. The investigations on pollutant sources in the region also uncovered their actual conditions. Transitions in Japanese environment-related statutes and the methods of reducing pollution were introduced to instruct appropriate development of legislation. As a result of the transfer of administrative guidance skills, SENASA came to conduct multi-level actions against illegal offices independently, including guidance, admonitory injunctions, and revelation.

(3) Efficiency

Most of the equipment provided demonstrated a high level of efficiency because of the effective usage by the counterpart. However, the dispatch of short-term experts was curtailed to about 60% of the initial plan. This led to a situation where the long-term experts had to complement tasks in their place. In addition, there were frequent transfer the counterpart. It cannot be denied that these factors had a negative impact on the effectiveness in acquiring the transferred technology.

(4) Impact

As a result of the administrative guidance that was based on the pollutant source investigations, discharges of pollutants to the basin from sources such as leather factories decreased. A significant decrease in COD (Chemical Amount of Oxygen Demand), a typical measurement of aquatic quality, indicates the project's contribution in purifying the lake water. However, there have been concerns that the investigations and guidance will be detrimental to corporate activities and employment. On the other hand, public opinion has been building that calls for people to take the initiative in preserving the natural environment. This provided a great opportunity to raise national awareness about the natural environment.

(5) Sustainability

The amount paid to cover local expenditure by Paraguay is subject to chronic shortage due to difficult finan-



Bird's-eye view of the northern side of Lake Ypacarai

cial conditions. The detailed amount was never revealed to Japanese side during the execution period of the project. Consequently, no projection can be made for the future. On the other hand, transfer of some of the functions in SENASA is being scheduled because of the establishment of the Environment Agency in July 2000. Since these trends reflect a high level of awareness among the administration on the conservation of the aquatic environment, the policy towards the water quality improvement of Lake Ypacarai is likely to be maintained in the future. However, it is possible that personnel changes due to restructuring of the ministries and agencies, and unstable employment conditions of the contract staff members may result in a loss or reduction of human resources.

6. Lessons Learned and Recommendations

(1) Lessons Learned

In order to decontaminate industrial wastewater, it is necessary that public facilities comply with the wastewater standard. Administrative guidance will be more effective when this process is prioritized.

(2) Recommendations

In order to improve the aquatic quality of Lake Ypacarai, organizations of various sectors need to continuously take a cooperative and comprehensive approach. Therefore, it is desirable to specify a governmental agency to be responsible for making the necessary coordination. It is also necessary to carefully consider the fact that mostly small enterprises with fragile management foundations are subject to the administrative guidance. Appropriate countermeasures should be taken for future activities and the water quality improvement plans. To alleviate pressures imposed on various pollutant sources, understanding by interested parties and citizens and support in public opinion is required. Environmental education targeting the entire nation should be considered.

Moreover, it is necessary to focus on human resources development within the organizations and to coordinate a structure assuring continuous employment.

The Forest Extension Project in the Eastern Region of Paraguay



Project Sites San Lorenzo

1. Background of Project

In Paraguay, the percentage of forest area to the total land area declined from 44% in 1968 to 15% in 1990. The Government of Paraguay has been taking various countermeasures including the enacting of the Afforestation Promotion Law in 1995. Furthermore, the Government requested of Japan a project-type technical cooperation. Its objective was set to extend forestry techniques to the farmers, stock farmers and villagers for the afforestation incorporating farmland and grazing land from the forests and woods in the eastern regions, where negative effects of deforestation as soil erosion were prominent.

2. Project Overview

(1) Period of Cooperation

24 April 1996 – 23 April 2001

(2) Type of Cooperation

Project-type Technical Cooperation

(3) Partner Country's Implementing Organization

Minister of Agriculture and Livestock National Forestry Service (SFN)

(4) Narrative Summary

1) Overall Goal

Sustainable forest resources are obtained in the eastern region of Paraguay.

2) Project Purpose

The forest extension technologies are transferred to the parties concerned in order to obtain sustainable forest resources in the eastern region of Paraguay.

3) Outputs

- The systems of training are strengthened.
- The management system of forest extension facilities is strengthened.
- The local extension activities are strengthened.

4) Inputs

Japanese Side

Long-term experts	12
Short-term experts	8
Trainees received	10

Equipment	139 million yen
Local cost	112 million yen

Paraguayan Side

Counterparts	60
Land and facilities	
Local cost	64 million yen

3. Members of the Evaluation Team

Team Leader:

Katsuro SAITO, Forestry and Environment Division, Forestry and Natural Environment Department, JICA

Reforestation/Nursery/Thinned Wood Utilization:

Ikuo TAKEUCHI, Chief of Silviculture Laboratory, Kansai Research Center, Forestry and Forest Products Research Institute, MAFF

Training and Extension:

Kazutaka IMAKI, Assistant Director, Management Division, National Forest Department, Forest Agency, MAFF

Planning Evaluation:

Hitoshi NAKATSUKA, Forestry and Environment Division, Forestry and Natural Environment Department, Project Operation Division, JICA

Socio-Economic Analysis/Evaluation Analysis:

Izumi OKATA, International Department, SANYU Consultants

4. Period of Evaluation

23 September 2000 – 14 October 2000

5. Results of Evaluation

(1) Relevance

The project purpose was relevant to the needs of the counterpart agency, SFN which has been executing policies to promote afforestation, such as the enactment of the Afforestation Promotion Law. Farmers that account for the majority of the target group are troubled by soil erosion caused by deforestation, and farm owners require shade forests for livestock. Therefore it was also relevant

to the needs of the target group.

(2) Effectiveness

Technical training was conducted for a total of 362 people in 18 courses of 6 fields. Instructors of these courses were mainly the counterparts who took part in editing 9 training textbooks in the 6 fields. As a result of the counterparts' efforts, training methods have become standardized and training systems have been strengthened, which activated the extension works. In forest extension facilities, seedling production capacity was upgraded to a production and distribution level of 280 million seedlings by September 2000, enabling easier access to planters. The better access, material supply and technical guidance made active forest extension possible. As for regional impacts, 8 areas were established as target areas for extension where 228ha were afforested. Apart from those, 193ha were afforested and model forests of 115ha established. Therefore, the transfer of knowledge and techniques on forest extension is considered to be making progress.

(3) Efficiency

Due to the personnel changes and the financial crisis followed by the change of regime, the assignment of counterparts were delayed and frequent reshuffling occurred. As a result of the delay and shortages of fund, contract employees were dismissed and salary payments were delayed as well. These were obstacles in technology transfer and in the efficient management of the program. The delay in the project operation budget due to the shortage of local cost from the Paraguayan side also became constraints in the extension activity. However, these delays did not result in being a major impediment for the activities and results. The efforts and flexible countermeasures taken in accordance with the input by the Japanese experts should be highly appreciated.

(4) Impact

Since afforestation activities require a long period of time until benefits are derived, there are no economic effects that can be seen at this moment. However, in the long term, afforestation activities are believed to increase job opportunities and the production and sales of artificial forest timber such as thinned wood, contributing to the improvement of local living conditions. New afforestation movements were also observed. For example, teachers who attended the training course started educating students and their parents on the environment. These parents planted trees along the streets. As seen in this example, results were seen in terms of the extension of techniques. There was also a case where the city government included afforestation into their greening programs after the training at the municipal office.

(5) Sustainability

The biggest concern is in the weakness of Paraguay's finances. Delay in local cost payments was seen, and a great portion of activity expenses was disbursed by the Japanese side. After the completion of the project, it might be impossible for the Paraguayan side alone to bear all the activity expenses, and that there is danger that a decrease



Villa Florida extension nursery garden

in funding will lead to a reduction or delay in the activity. Also, frequent personnel rotation became a disincentive to the counterparts, with a lack of responsibility towards the end result. Securing talented personnel is important for the development and success of technical transfer, but changes of counterpart personnel and dismissal of contract-based staff that have learned the technology are becoming negative factors. Considering these factors, even though it might have been impossible to predict the rapid deterioration of Paraguayan finances, it should be admitted that the target group and target area was set too broad in the initial project plan.

6. Lessons Learned and Recommendations

(1) Lessons Learned

When planning a project, it is necessary to investigate and analyse the capacity of the enforcing organizations thoroughly from both personnel and finance aspects, and plan a project range and scale appropriate to its capacity. During the enforcement of the project, a system that allows counterparts to carry out the project independently should be established while fostering their ownership.

(2) Recommendations

The SFN is required to make efforts to maintain, utilize and further develop the coherent system from seed production to afforestation. Also annual work plan and budget plan should be prepared, and a new operational structure should be established by the end of the project period taking absence of Japanese financial input in to consideration. As for the extension sector, a national level extension strategy should be established that prioritizes the target area and target group. Finally, it is appropriate to continuously pursue the construction of a forestry extension system that works in close cooperation with municipalities.

Project for Improvement of Waste Disposal Equipment in Asuncion



Project Sites Asuncion

1. Background of Project

One-fourth of Paraguay's total population is concentrated with in the vicinity of Asuncion, the capital city. Along with recent rapid population increase, waste disposal has been gaining attention as a serious urban sanitation issue. Although some areas had waste collecting and final disposal systems, it was not sufficient as a whole in the Asuncion area. The Paraguayan Government developed a "Plan for Improvement of Waste Disposal Equipment in Asuncion" during 1997 – 1999, and requested Japanese grant aid to prepare equipment necessary for collecting and reclaiming waste.

2. Project Overview

(1) Period of Cooperation

FY1997

(2) Type of Cooperation

Grant Aid

(3) Partner Country's Implementing Organization

Asociacion de Municipalidades del Area Metropolitana (AMUAM),
Autoridad Metropolitana de Manejo de Residuos (AMMR)¹⁾

(4) Narrative Summary

1) Overall Goal

A waste collecting services system in Asuncion is established, and the sanitation in the area is improved.

2) Project Purpose

Necessary equipment for waste collecting and reclaiming at the final disposal plants is provided, in order to improve the urban environment.

3) Outputs

Compactor trucks, dump trucks, and earthmovers necessary for waste disposal are provided.

4) Inputs

Japanese Side

Grant	799 million yen (E/N amount)
-------	---------------------------------

Paraguayan Side

Facilities

3. Members of Evaluation Team

Team Leader:

Akiko KAMEDA, Foreign Secretariat, Economic Cooperation Bureau, MOFA

Preparation Status Research:

Yoshikazu ITO, Japan International Cooperation System

Translator:

Yoshimi SUGANO, Japan International Cooperation System

4. Period of Evaluation

3 February 2001 – 12 February 2001

5. Results of Evaluation

(1) Relevance

A comprehensive waste disposal system was urgently needed in the metropolitan area of Asuncion, as the urban sanitation problem had become serious due to the increase of the population and an insufficient collecting service. As this project satisfies such needs of Paraguay, its relevance is recognized.

(2) Effectiveness

In this project, 15-ton compactor trucks were provided to four cities in the area and the AMMR, as well as 10-ton dump trucks to clear illegally dumped waste and to clean roads. Inventory management is also being conducted using computers for all spare parts of trucks in the AMUAM and AMMR. Trucks for maintenance and repair were also provided. The AMUAM, AMMR, and Direccion de Aseo Urbano, Municipalidad de Asuncion jointly manage the final disposal facilities, based on the sanitary reclamation manual developed in this project. Other manuals were also created for a measuring weight system of compactor trucks carrying wastes to disposal facilities. From these facts, it is clear that the Japanese technology transfer has been proceeding.

(3) Efficiency

This project is concluded as efficient with timely and appropriate selection of equipments, from the fact that equipment was deployed as planned and the waste collection service has been operating smoothly. Due to the delay of other donor's projects, (the World Bank and the Inter-American Development Bank) the equipment purchased through this project has been, under excessive operation. The compactor trucks operate 18 hours a day on average which are much longer than the initially planned 8 hours, and the earthmovers operate 20 hours a day while their durable hours is 10,000 hours.

The Direccion de Aseo Urbano manages equipment given to Asuncion City, while the AMMR, under jurisdiction of the AMUAM, manages those at of the other three cities. Each local authority pays a rental fee (approximately 200,000 yen per truck) and is charged for final disposal facility usage, which is used to maintain the AMMR's equipment. However, those fees are liable to be delinquent, as there is neither an established system to charge the collecting service to the user, or the residents, nor a charging system for using the final disposal facilities according to usage.

(4) Impact

The number of areas without garbage collecting service decreased. The regulation to bring in wastes to smaller disposal facilities of each local authority was lifted after proper sanitary reclamation at the final disposal facilities. Problems of offensive odor and scattering of wastes near the disposal facilities of local authorities were solved.

(5) Sustainability

Equipment provided in this project is used far beyond



Operation test of compactor collection vehicles

the initially planned operating hours. This is due to the fact that the equipment has not been supplemented because of the delay in aid by other donors and maintenance tools and engineers has been in short of in the AMUAM and AMMR. This is one of the points of concern on sustainability of this project. Also, the budget of the AMUAM and AMMR relies on collecting fees from local governments, which are in arrears.

6. Lessons Learned and Recommendations

(1) Lessons Learned

Equipment provided in this project is being used far beyond the initially planned operating hours. It means that a maintenance system should be prepared, including smoother procurement of repair tools and spare parts, and budgets for fostering engineers. Along with reinforcing the maintenance system by the institutions in charge, Japan needs to consider dispatching experts or Japan Overseas Cooperation Volunteers for maintaining equipment, to prepare for breakdown or other unexpected accidents.

Lastly, sustainable operation would be possible by properly adjusting rental fees of trucks to each local authority according to the circumstances.

¹⁾ The implementing organization subordinated to the counterpart organization, AMUAM, the association of local municipalities within the metropolitan area.