

# Project to Improve Facilities for Rainwater Drainage in Cotonou



Project Sites Cotonou

## 1. Background of Project

Cotonou, the largest city in Benin, is the economic and commercial center of the country; however, as urbanization is rapidly progressing, the maintenance of the infrastructure that is necessary for civic life is delayed remarkably. In particular, the rainwater drainage facilities of this city have degraded considerably, and accumulations of soil and garbage are hindering the water flow. As a result, in the rainy season, rainwater overflows everywhere including the central part of the city. The daily life and the traffic of the citizens are interfered, and the environmental hygiene of the city is worsened significantly. Furthermore, malaria-carrying mosquitoes breed in the stagnant rainwater, negatively affecting people's health.

In order to improve such conditions, the Government of Benin decided upon a plan for repairing of the rainwater drainage facilities for two areas, Area A and Area B, in which floods occur frequently, and requested Grant Aid from Japan for the expansion and repairs to the drainage network, and procurement of equipment.

## 2. Project Overview

### (1) Period of Cooperation

FY1997 – FY1999

### (2) Type of Cooperation

Grant Aid

### (3) Partner Country's Implementing Organization

Bureau of City Planning and Sanitation, Ministry of Environment, Housing and City Planning

### (4) Narrative Summary

#### 1) Overall Goal

- Flood damage is reduced in the targeted areas.
- The city sanitation condition of the targeted areas is improved.

#### 2) Project Purpose

Rainwater comes to be drained rapidly in the two areas of Cotonou.

### 3) Outputs

- Rainwater drainage facilities are repaired or established (the first, second drainage ditch, a drainage ditch crossing road, and a roadway, sidewalk).
- Equipment for the improvement and establishment of the rainwater drainage facilities is provided.

### 4) Inputs

#### Japanese Side

Grant	1,886 million yen (E/N amount)
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#### Beninese Side

Transfer of the building of the facilities construction ground.

## 3. Members of Evaluation Team

### Team Leader:

Yoshiki OMURA, Senior Advisor, JICA

### Administration Investigation:

Tsutomu SUZUKI, Project Monitoring and Coordination Division, Grant Aid Management Department, JICA

### Facilities Condition Investigation:

Toru TAKAGI, Japan International Cooperation System

### Interpreter:

Masao MATSUBARA, Japan International Cooperation Center

## 4. Period of Evaluation

10 June 2000 – 21 June 2000

## 5. Results of Evaluation

### (1) Relevance

The Government of Benin places high priority on the improvement of rainwater drainage facilities and have been receiving assistance from other donors such as the

World Bank. The basic design study estimated rainwater overflow will be prevented by the execution of the project, as well as the occurrence of malaria caused by stagnant water in the drains. Approximately 20,000 people would benefit from such conditions. The sanitary condition of the area will be remarkably improved; the relevance of this project is recognized.

## (2) Effectiveness

The constructed facilities function properly, and swift drainage of the rainwater became possible. Every year, the inundations, which occurred in the rainy season, used to be 1m at maximum; however, it is now improved to the level of 10cm. The rainwater overflow used to continue for 2-3 weeks; it is now drained within several hours. As for the area in which the part of the flow of the first drainage way was poor, a new bypass drainage way was built. As a result of these improvements, the overflow of rainwater from the drainage ditch disappeared, even at the time of the rain, which is confirmed from interviews with residents of the area.

## (3) Efficiency

The construction was done smoothly and completed earlier than planned. The procurement and custom clearance of the equipment was carried out efficiently with delivery without delay within the term of the contract.

## (4) Impact

Prior to this project, flood damages occurred every rainy season. However, after the project, flood damages decreased, which made a great difference to life in local areas. The completion of the drainage supported the policy of the government to improve the urban environment, and it also revitalized the implementing organization. The impact of the activities as a result of the cooperation between the public and the private sectors is positively evaluated.

Regarding the occurrence of malaria, although impossible to confirm statistically, it has definitely decreased according to a report by MEHU.

## (5) Sustainability

In January 2000, the jurisdiction of operation and maintenance of the drainage ditch was transferred from MEHU to the City of Cotonou. In Cotonou, as a part of operation and maintenance, a private company is entrusted with dredging of the sand and mud at the bottom of the drainage twice a year. Also, cleaning around the drainage ditch is conducted and illegal disposal of garbage is controlled by a contracted private management company. As a result of campaign for the citizens of Cotonou through television, radio, area meetings, schools and NGOs, the citizens clean the drainage way voluntarily twice a month. From above, the operation and maintenance of the drainage ditch has been smoothly carried out.



Drainage ditch

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

Under the Grant Aid scheme, at the time of equipment delivery, guidance on the initial operation is given only in a short time. The counterpart, however, sometimes has difficulty in learning how to use it completely. If improper operation and insufficient maintenance continue, the operating rate and the life of the equipment will be greatly affected. Using soft-components in order to enable the counterpart to learn how to manipulate the equipment completely is one of the ways of enhancing the effects of the project.

Regarding the equipment manuals, all manuals except for one, were written in English, and it can be said the consideration was insufficient for Benin, which is in a French-speaking country. When a similar project is executed in the future, this point must be improved.

### (2) Recommendations

The project can be broadly divided into the construction of new facilities and the rehabilitation of existing ones, and the rehabilitation areas are largely deteriorated and immediate repair is needed. Currently, the City of Cotonou is checking the deterioration and the parts requiring repair, and preparation for the repair is in progress.

Moreover, the existing drainage ditches that branch off near the ward office of Area B, are not cleaned, and therefore water do not drain smoothly. At the same point, although a new drainage ditch was built by the project, in order to raise the efficiency of the drainage system, and also for reasons of sanitation, cleaning of the existent drainage way is necessary<sup>1)</sup>, and the improvement of the situation with the cooperation between the City of Cotonou and MEHU is required.

<sup>1)</sup> JICA local office confirmed in 2002 that the Benin side has been repairing and cleaning the drainage ditch.

# The Integrated Watershed Management in Inland Valleys in the Republic of Ghana



Project Sites Kumasi

## 1. Background of Project

Agriculture is one of Ghana's priority sectors in its development plan. Government policy aims at ensuring food self-sufficiency in the major staples products, including rice, for the purpose of food security and adequate nutrition. On the other hand, inland valleys found commonly in Ghana, have been cited as having the appropriate ecology for wetland rice cultivation because of their favorable hydrological and soil conditions. However, measures to develop the land into rice fields have not been established so far. Based on this background, the government of Ghana asked the government of Japan to undertake collaborative research work to address rice production in an integrated approach involving all of the various eco-technology systems within a inland valley watershed area.

## 2. Project Overview

### (1) Period of Cooperation

5 August 1997 – 4 August 2000

### (2) Type of Cooperation

Research Cooperation

### (3) Partner Country's Implementing Organization

Council for Scientific and Industrial Research (CSIR), Crops Research Institute (CRI), Ministry of Food and Agriculture (MOFA)

### (4) Narrative Summary

#### 1) Overall Goal

The small-scale farmers of the project area develop strong interest in participating in the synthetic development of agriculture based on eco-technology.

#### 2) Project Purpose

The eco-technology development plan is formulated, which is conformed to the agricultural, ecological, and social systems for the small-scale collec-

tive water areas.

### 3) Outputs

- The project steering committee is established.
- Equipment for field observation, equipment for agriculture, and others are supplied in CRI.
- Technology transfer is carried out to CRI and the staff of the related organization.
- The practical research and the evaluation are carried out in the four areas of eco-technology (water, soil, crop, forestry and farm village life).
- Based on the actual results from practical research in the four areas of eco-technology, there are found to be various elements that become the key to participation approaches.

### 4) Inputs

#### Japanese Side

Long-term experts	4
Short-term experts	13
Trainees received	10
Equipment	

#### Ghanaian Side

Researchers	14
Secretary and driver	2
Office and facilities	

## 3. Members of Evaluation Team

### Team Leader;

Noriko SUZUKI, Africa Division, Regional Department 4 (Africa, Middle East and Europe), JICA

### Technical Instructions;

Junji TAKAHASHI, Senior Advisor, JICA

### Evaluation Coordination:

Nana HOSOI, Africa Division, Regional Department 4 (Africa, Middle East and Europe), JICA

### Project Evaluation:

Takahiro MIYOSHI, Fukuyama Consultants Co., Ltd.

## 4. Period of Evaluation

22 August 2000 – 7 September 2000

## 5. Results of Evaluation

### (1) Relevance

This project has focused on assistance in the development of rice fields in inland valley watersheds. It has met the needs of the Government of Ghana, which enforces policies related to improving the food self-sufficiency rate. According to interviews, the local farmers have high expectations about rice cultivation in the inland valley watersheds. Therefore, this project satisfies their needs.

### (2) Effectiveness

In this project, the watershed management techniques based on eco-technology in the four areas – water and soil, crop, forestry, and rural life – have been developed. An action research team on each field created output such as manuals and final reports describing the results in the four areas submitted to related organizations, including JICA. Therefore, the initial goals of this project have been achieved for the most part.

### (3) Efficiency

In this project, each team had different counterpart organizations under the CSIR. Thus, at the beginning of the project, the research activities were carried out with little synergy among the participating organizations. There were partly delays and changes in personnel assignment on both the Japan and Ghana sides because the research plan for each team was not fixed. These issues, which are related to efficiency at the early stages of this project, were identified and improved at the time of the mid-term evaluation. Although some could not be used by the lack of electric power, equipment was prepared for the most part as scheduled.

### (4) Impact

As this project was a research cooperation, the direct target area was very small. Thus, impacts such as the large changes that were brought widely for the natural environment and the life of the local residents, were not observed. However, after finding that the rice crop yields in the fields increased to four to five times that of the conventional ways of cultivation, the farmers at the site started to be extremely interested in the project. Therefore, the impact on the farmers was high.

### (5) Sustainability

As the test field requires only light maintenance of the waterways and dykes, the Ghanaians will be able to maintain it by themselves. Through this project, the research capability of the Ghanaian side is definitely strengthened and the sustainability is demonstrated through the produc-



Rice planting in an inland valley rice field

tion of the manual and the guideline. Regarding the future activities plan on the Ghanaian side, the European Union is being asked for funding to assist in further research using the test field, and the World Bank's aid is also considered to extend activities to the farmers through the micro credit. These reveal the Ghanaian trend of sustainability.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

In a project aiming at "comprehensive development," such as this one, the concerned organizations should be closely tied to each other, and they need to share a common understanding of the work plan and progress management. Since researches often fail to garner tangible results, it would be desirable to clarify the concrete research results beforehand. It is also important to set concrete indicators to facilitate the achievement of results and the monitoring.

### (2) Recommendations

It is recommended that the research result of this project be shared between a concerned organization such as the SCIR and MOFA, and that the rice cultivation techniques in inland valley watersheds be widely disseminated through MOFA to the small-scale farmers.

## 7. Follow-up Situation

At the mid-term evaluation in January 1999, the period up to March 2001 was set as the follow-up period to finalize the research results.

In February 2001, an international workshop was held to extend the research results to the neighboring countries with the participation of West African countries and international organizations such as the International Institute of Tropical Agriculture (IITA) and FAO.

# The Project for Construction of Sekondi Fishing Port



Project Sites Sekondi

## 1. Background of Project

Fishing ports in the Republic of Ghana do not have loading facilities or ice machines except for one. This poor condition of fishing harbors causes serious problems in terms of the quality of fish catches. The Sekondi fishing port, the central port in the western part of the country, did not have an adequate quay for coastal fishery boats. Therefore, brokers conducted business with those coastal boats from a position of anchorage off the coast. Since those brokers were using small canoes, trading of the fishing catch was very limited in terms of both variety and quantity. Moreover, the lack of oil filling stations and other facilities has been reflected in their poor performance in terms of efficiency and quality control. Additionally, the shallow waters of the port have often led to damage to the bottom of fishing boats. Because of the frequent necessity to repair fishing boats, fishermen tend to be beset with financially difficult situations. The existence of poorly operating fishing ports is closely related to the severe financial condition of fishermen. The government of the Republic of Ghana made a request to the Japanese Government for Grant Aid in order to reconstruct the Sekondi port. The Ghanaian Government is hoping that the Sekondi port will play a major role in promoting the fishing industry in western Ghana.

## 2. Project Overview

### (1) Period of Cooperation

FY 1997 – FY1998

### (2) Type of Cooperation

Grant Aid

### (3) Partner Country's Implementing Organization

Ghana Ports and Harbors Authority (GPHA)

### (4) Narrative Summary

#### 1) Overall Goal

The fishing catch is increased in order to supply food for the people, and job opportunity is secured through development in fisheries industry.

### 2) Project Purpose

By constructing appropriate fishing port facilities at the Sekondi Port, the fishing industry becomes efficient in its business performance.

### 3) Outputs

- The fishing port (shipping quay, apron, canoe jetty, breakwater, seabed dredging in port, bank protection, and so on) is improved.
- The fishing-related facilities (administration buildings, lavatories, ice making plant and ice storage facility, fish handling shed, water supply system, security light system, clear and waste water systems) are improved.
- Ice making plant is provided.
- The maintenance and managing system for the fishing port facility and equipment is well operated.

### 4) Inputs

#### Japanese Side

Grant	1.698 billion yen (E/N amount)
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#### Ghanaian Side

Land	
Facilities and roads	

## 3. Members of Evaluation Team

### Coordination and management research:

Shigetada KAYUMI, Senior Advisor, JICA

### Grant aid cooperation:

Masayasu ITO, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs,

### Facility research:

Azusa KIKAWADA, Japan International Cooperation System

## 4. Period of Evaluation

3 June 2000 – 11 June 2000

## 5. Results of Evaluation

### (1) Relevance

The Mid-term Agriculture Developmental Plan 1991 – 2000 stated that the Republic of Ghana focused on 1) expanding the fishing catch for national food supply, 2) diversifying economic structure in the rural area and creating additional job opportunities in the fishing industry, 3) promoting sustainable development for inland water and marine fisheries. This project purpose is set up based on the Ghana's national developmental policy.

### (2) Effectiveness

Since the establishment of the new fishing port, large fishing boats are able to come alongside the quay to load the fishing catches. The fishing catches are loaded directly into refrigerated cars, and transferred to inland areas and storehouses for export. The statistical data provided by the control office of Sekondi fishing port shows that 5,876 containers were loaded from 51 steel fishing boats since the opening of the new port. To the best of the knowledge of the control office, there are no reported cases of scraping or damage to the bottom of ships. It is due to securing depth of the shipping route in the port. It is reported that 25 coastal fishing boats and 4 steel fishing boats were newly registered after the opening of the new port, taking advantage of the efficient facilities installed.

### (3) Efficiency

Generally speaking, this project is regarded as being efficiently operated, minimizing negative impact due to the political conditions and the weather. In most of the stages, the project was estimated as efficiently carried out considering the timing of providing labor forces, supplying equipment for construction, the quality of construction, and its completion.

### (4) Impact

Investment of private capital has commenced in the area. For example, filling stations for fishing boats are established, restaurants are opened at the port and its surrounding areas since the construction of the port. This port is even becoming a new tourist attraction in Sekondi because of its great view and its modern architecture. Tourism has become a newly developing business in the area. Moreover, various companies such as refrigeration businesses have been attracted to this area.

Anticipating an unfavorable impact on some of the fish brokers, there had been some movement against the construction, involving the fishermen's and retailer's association. The mediation with those people was held by the control office of the fishing port in 2000. The loading at the port from the coastal fishery boats alongside of the quay began taking place after the mediation.

### (5) Sustainability

Sekondi fishing port has attained profitability, and the port is well managed financially. The GPHA is planning to establish a fish market on adjoining land, which is to be



The new canoe dock adjoining the newly-created fish market

completed in June 2000. With the completion of the market, it will be possible to trade fresh fish on a clean concrete floor with a roof. The fishing catches will keep their freshness because they will be loaded from the ship into iced compartments made by an ice making plant. This is a great benefit for not only fishermen but also for fish brokers and consumers.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

The project has brought about a concern in which fish brokers lose their jobs because of the new fishing port and provoked an opposition movement. Sometimes implementing a project brings about both positive and negative results. Therefore, it is important to have talks with the concerned people to predict the expected negative impact at the planning stage. If any negative effects are foreseen, the recipient government should be advised to solve them before starting a project.

### (2) Recommendations

Generally speaking, the construction of a port changes its environment, through for example, the erosion of the coastline and water pollution. Such changes do not appear in a short period of time. It is important to be aware of environmental changes of the area by conducting periodical monitoring. Moreover, it is suggested that the GPHA collects various data such as the kinds of boats that come alongside the quay and the amount of fishing catch offloaded. They need to identify the effects of the project by doing so.

# The Research and Control of Infectious Diseases Project, Phase 2



Project Sites Nairobi

## 1. Background of Project

JICA has been supporting the Kenya Medical Research Institute (KEMRI) through the KEMRI Construction Project by grant aid (1982 – 83), the KEMRI Technical Cooperation Project (1985 – 90), and the Research and Control of Infectious Diseases Project, Phase I (1990 – 96). Results of this series of projects, and the evaluation findings of the last project led to the request for a project focused on public health priorities in Kenya (HIV/AIDS, acute respiratory infections (ARI) and viral hepatitis (VH)). The project for Improvement of KEMRI by grant aid was implemented in 1997 to construct the P3 lab, which is an essential facility for this Project.

## 2. Project Overview

### (1) Period of Cooperation

1 May 1996 – 30 April 2001

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Kenya Medical Research Institute (KEMRI)

### (4) Narrative Summary

#### 1) Overall Goal

The health situation in Kenya is improved by strengthening research capability and developing human resources at KEMRI.

#### 2) Project Purpose

Sustainable research and development (R&D) related to HIV/AIDS, ARI, and VH is realized.

#### 3) Outputs

- a) An R&D system for HIV/AIDS diagnostic kits (PA kits) is developed.

- b) A system of research on ARI is developed.
- c) An R&D system for VH diagnostic kits (HEP-CELL II kits) is developed.

#### 4) Inputs

##### Japanese Side

Long-term experts	15
Short-term experts	39
Trainees received	20
Equipment	253 million yen
Local cost	130 million yen

##### Kenyan Side

Counterparts	59
Land and facilities	
Tax exemption	
Equipment	
Local cost	20 million yen

## 3. Members of Evaluation Team

### Team Leader:

Shunzo CHIBA, Professor, Medical School of Sapporo Medical University

### HIV/AIDS:

Takashi KURIMURA, Professor Emeritus, Osaka University

### ARI:

Shigeru KAMIYA, Professor, Medical School of Kyorin University

### VH:

Michitami YANO, Director, Nagasaki Chuo National Hospital

### Coordinator:

Ikuo TAKIZAWA, Second Medical Cooperation Division, Medical Cooperation Department, JICA

## 4. Period of Evaluation

9 August 2000 – 26 August 2000

## 5. Results of Evaluation

### (1) Relevance

The project on the targeted diseases, HIV/AIDS, ARI, VH was relevant, as all of them have been public health priorities in Kenya.

### (2) Effectiveness

From the outputs of the HIV/AIDS program, KEMRI was enabled to locally produce PA kits. Research on medicinal plants led to the discovery of their antiviral activities. Also, clinical tests showed the effect of preventing mother-to-child transmission of HIV.

Drug sensitivity tests for ARI revealed drug-resistance against some standard medicines. The findings will enable more effective medication.

Local production of HEPCELL kits was started in the previous phase of the Project for VH. This phase further introduced lyophilization for quality preservation. As a result, 2,670 kits were produced between July 1996 and February 2000, of which 1,776 kits were distributed to all provincial hospitals in Kenya.

### (3) Efficiency

Under limited inputs, satisfactory outputs were shown, thus the project was managed efficiently as a whole. However, some equipment and consumables from earlier stages were underutilized due to changes in the project plan. Very few counterparts were motivated well enough to transfer knowledge and skills to their colleagues; thus training of personnel needs to be improved.

### (4) Impact

Although the local production scheme was established for PA kits, this type of kit has not been widely utilized due to its only recent approval by the Government. The research results of medicinal plants collected in Kenya as well as the clinical tests on mother-to-child transmission have high potential to be applied to the prevention and treatment of HIV/AIDS in the future.

Treatment effects of ARI will be improved when the survey findings of drug-resistance are reflected in treatment guidelines. Educational activities with videos and pamphlets were successful despite the limited budget. Household-visit education by women volunteers is among the factors of success. These educational activities are expected to contribute effectively to preventing infantile ARI.



Consultations on the project implementation

By the improvements of production technologies of the KEPCELL II kits, their usage in screening VH-B increased to have 60% share of the total blood supply in the Government facilities in Kenya. It has greatly contributed to the prevention of infection.

### (5) Sustainability

Technology transfer was sufficiently conducted, assuring technical sustainability. Mid- to long-term sustainability is questionable, considering KEMRI's weak human resource development strategies for young researchers.

Financial sustainability is possible due to the growing local production of KEPCELL II kits, the commitment of the Ministry of Health to procure KEPCELL II, and the expected development of PA kits as KEPCELL II. For other research and development activities, sustainability would not be attained since most of the operating costs, except for personnel costs, were financed by the project costs.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

Release strategies of the research results should be clearly defined from the beginning of the project. It will help identify and specify activity goals of research and development.

### (2) Recommendations

Data and experiences gained from the research on mother-to-child HIV transmission should be documented.

The production plan of the KEPCELL II kits, and the PA kits should be embodied.

Also, for the overall project, data of all the studies should be analyzed and documented for each research and development activities.



# Comprehensive Study on Lake Malawi Ecology for Sustainable Utilization



Project Sites Zomba

## 1. Background of Project

Lake Malawi is highly recognized not only for its important functions in water transportation, irrigation, sightseeing and fishing, but also for its richness in valuable natural resources. In recent years, however, due to the deterioration of the environment and excessive fishing caused by a rapid increase in population, the quantity of fish in the lake has been seriously diminished, resulting in the deprivation of an affordable protein resource for the nation.

To sustain the fish resource, extensive research on ecology would be indispensable. This includes other academic approaches in natural science and in socio-cultural studies. However, such interdisciplinary research facilities are not adequately developed in Malawi, hence the accumulation of data and knowledge is insufficient for the purpose of policy planning by the government.

The Chancellor College, University of Malawi, is the most renowned institution for fishery and environmental studies in the country. It decided to carry out a comprehensive research on the fish ecology of Lake Malawi at the behest of the Government of Malawi and because of increasing international concern. The request of the cooperation was made to Japan that has a successful experience in a similar cooperation project in Lake Tanganyika in East Africa.

## 2. Project Overview

### (1) Period of Contract

1 May 1998 – 30 April 2001

### (2) Type of Cooperation

Research Cooperation

### (3) Partner Country's Implementing Organization

Chancellor College, University of Malawi

### (4) Narrative Summary

#### 1) Overall Goal

The research system established by this project is fully utilized by researchers and policy-making

agencies for the resource management of lakes and swamps.

#### 2) Project Purpose

Latest knowledge on the ecology of Lake Malawi is accumulated, and facilities for interdisciplinary research available for both researchers and local inhabitants are established.

#### 3) Outputs

- a) Research system to study the ecology of Lake Malawi is established.
- b) Interdisciplinary research (fish molecule system learning, sociology, ecology) on the ecology of Lake Malawi is carried out.
- c) The local community participates in the research process.
- d) The research facilities (experiment ridge, field station) are expanded and improved.
- e) A database is established, making it possible for government agencies and inhabitants to share an overall knowledge of the ecology of Lake Malawi, and Related reports are published.
- f) Research results are conveyed to policy-making agencies as fundamental ideas in policy planning for feasible resource management.
- g) Teaching materials and course programs are prepared for undergraduate and graduate students.

#### 4) Inputs

##### Japanese Side

Long-term experts	4
Short-term experts	20
Trainees received	6
Equipment	25 million yen

##### Malawian Side

Counterpart	10
Land and facilities	
Local cost	

### 3. Members of Evaluation Team

#### Team Leader:

Katsuhiro SASAKI, Planning Division, Regional Department (Africa, Mid-East and Europe), JICA

#### Technical Instruction:

Yasuo TAKAMURA, Professor, University of Kyoto

#### Cooperation Evaluation:

Megumi KOURA, Regional Department (Africa, Mid-East and Europe), JICA

#### Project Evaluation:

Seizou YAMADA, Katahira Engineering International, Limited.

### 4. Period of Evaluation

5 November 2000 – 13 November 2000

### 5. Results of Evaluation

#### (1) Relevance

A comprehensive study on the ecology of Lake Malawi is indispensable for maintaining the nation's supply of fish as an affordable source of protein. Reflecting a local need, this project holds relevance.

#### (2) Effectiveness

An interdisciplinary research organization called "Unit" was installed at the University of Malawi, and research facilities have been expanded. In addition to the inhabitants' participation in the research process, the availability of the research outcome increased by the distribution in the forms of illustrated books, subject manuals, internet, and others. Therefore, it is considered that the research facilities are now well-equipped for the active involvement of researchers and local community. On the other hand, due to a shortage of manpower and time, holding of seminars regarding the research results and preparation of educational materials and programs for the local community were not achieved. However, this did not influence the overall project effectiveness.

#### (3) Efficiency

The only research field that had long-term experts for the full project period was fish ecology. There has been a delay in dispatch of project coordinator and expert to other research fields. A set of equipment was supplied promptly, and its maintenance has been properly controlled.

The research results have been extended ahead of schedule due to the participation of local inhabitants.

#### (4) Impact

Because the relevant persons were adequately informed of the necessity, purpose and content of this project, the awareness level toward the problems was raised. It also successfully led to producing researchers who can contribute to the sustainable development of the country.

Although the research outcome had not yet been applied to actual policy-making at the time of project



Lake Malawi with the most varied species of fish in the world

evaluation, policy for conveyance to the government including seminars on the research results was decided.

#### (5) Sustainability

The supporting system of development of research facilities has been established by the Ministry of Finance and Economic Planning, the University of Malawi, the National Park Wildlife Section and the Fishery Department. The Government of Malawi assures the salaries of researchers and management costs, while counterparts are working towards acquiring the necessary funds to cover costs in addition to those above. However, it should be noted that it is essential to find a source to meet local costs, such as investigation trips and expendables. There is special concern over whether the maintenance cost of the DNA Sequencer can be continuously obtained. The maintenance management of other kinds of equipment and the arrangement of human resources are carried out properly, therefore, sustainability is highly expected.

### 6. Lessons Learned and Recommendations

#### (1) Lessons Learned

For interdisciplinary projects, which require involvement of a number of people, it is essential to coordinate the necessary tasks fully and in advance. Therefore, even small-scale projects should include a project coordinator from the beginning of the entire process. When planning, because a delay in supplying input is expected, it would be desirable to allow enough time for the implementation.

#### (2) Recommendations

For full utilization of the supplied equipment such as the DNA Sequencer, a concrete plan including fund management should be carefully prepared and implemented.

# The Korofina District Water Supply Planning Project



Project Sites Bamako

## 1. Background of Project

The government of Mali identified, as a national agenda, stable supply of clean water to 18 cities with populations over 10,000. Korofina district, which is located in the northeast of the capital city, Bamako, had experienced a rapid population increase. The increase was caused by a population influx from the city center and its rural surroundings.

Meanwhile, according to 1995 statistics, the water supply diffusion rate in the district remained at 47% of approximately the population of 250,000. Moreover, as the population increased, the increase in water demand incurred low water pressure and water failure.

In those areas where there are no access to water supply systems and using aged shallow wells, the following subjects became issues of the poor community. First was the water shortage caused by a decline in well-water levels during the dry season. The second issue was the spread of disease caused by the declining water quality. Therefore, to provide clean water, the government of Mali designed the "Korofina District Water Supply Planning Project" and made a request to Japan in 1993 for grant aid.

## 2. Project Overview

### (1) Period of Cooperation

FY1996 – FY1998

### (2) Type of Cooperation

Grant Aid

### (3) Partner Country's Implementing Organization

Water Supply Department of Mali Energy Public Cooperation (EDM), the Agency of Water Facilities and Energy in the Ministry of Mining, Energy, and Water Facilities

### (4) Narrative Summary

#### 1) Overall Goal

Expansion of water purification plants and improvement of water distribution lines is achieved through the "Korofina District WaterSupply Planning".

### 2) Project Purpose

Domestic noncommercial water is provided stably to the residents of Korofina district.

### 3) Outputs

Capability to supply water is improved by constructing water supply facilities.

#### Japanese Side

Grant	2.2 billion yen (E/N amount)
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#### Malian Side

Administration of water supply facilities, proliferation of faucets

## 3. Members of Evaluation Team

### Team Leader:

Isao FUKUSHIMA, Grant Aid Management Division, Economic Cooperation Bureau, Ministry of Foreign Affairs

### Operating Conditions Evaluation:

Makoto TAKAHASHI, Fourth Project Management Division, Grant Aid Management Division Department, JICA

### Facilities Conditions Evaluation:

Hirofumi MIYASHITA, Japan International Cooperation System

### Interpreter:

Masashi ISHIKAWA, Japan International Cooperation System

## 4. Period of Evaluation

12 February 2001 – 24 February 2001

## 5. Results of Evaluation

### (1) Relevance

This project was implemented based on the "Bamako Water Supply Planning Project" which aimed for the expansion of water purification facilities and improvement of water distribution lines for areas with poor water

supply facilities including Korofina district.

As this plan was founded upon a Mali national agenda, it is considered relevant.

### (2) Effectiveness

The project increased the water supply to Korofina district from 12,000m<sup>3</sup> per day in 1995 to 21,000m<sup>3</sup> per day in 2000. It also increased the water supplied population from 117,000 in 1995 to 256,000 in 2000 and the district's water supply rate to 75%.

Thus, the project has almost achieved the objective set by the basic design study of 1996. That is, the project would supply clean water to 310,000 people, accounting for 78% of the estimated population of year 2000, 400,000.

In addition, the Mali side installed 1,968 private faucets and 136 communal faucets, constructed 10 km of secondary distribution pipes, and constructed lead-ins for connecting distribution pipes and power cables in water purification facilities.

### (3) Efficiency

The materials and equipment for the project were procured smoothly within the contracted period, and passed Mali Customs efficiently. As the construction was done efficiently, it was completed as scheduled.

By the efforts of the EDM, police force, municipality, and mass media, no delays were caused in the construction of waterlines from the Bamako water purification facility to the Korofina water distribution reservoir, despite them having to run through the heavy traffic roads, many crossings over railways and rivers and residential areas.

### (4) Impact

The EDM installed 162 communal faucets in this project. As the objective of the basic design, the sum of the communal faucets was expected to be 198 in Korofina district in 2000. However, the communal faucets amounted to 278 in 2000.

More than the intended number of faucets was installed by the municipality (18 faucets) and individuals (93 faucets). This success could be attributed to the community's understanding of the significance of the project. As the community actively participated, the government of Mali appreciated this project as a successful model of community participation for development planning.

In 1999, 1,252 individuals who had abandoned their water service contracts, re-signed their contracts. This proved that the water service operation had gained the users' trust. Consequently, water bills were smoothly collected, and the collection rate increased from 70% in 1995 to 93% in 2000. As a result, the financial standing of the Bamako purification facility was improved.

The improvement of the water supply rate solved problems that used to be prevalent in Korofina district, such as low water pressure and water failure. According to interviews with the residents, there were decreases in water shortages during the dry season and waterborne diseases such as diarrhea. Moreover, the workloads of women and children carrying water were reduced.



Communal faucet

### (5) Sustainability

This project contributed to the drastic increase in income of the water service section of EDM; to be more precise, from 890 million yen in 1995 to 1.52 billion yen in 2000. Consequently, the water service operation in Bamako was covered 100% by the income. In addition, the EDM increased the number of personnel from 90 in 1996 to 114 in 2000.

Regarding technical level, there seemed to be no problems as EDM engineers have handled breakdowns that have happened so far.

## 6. Lessons Learned and Recommendations

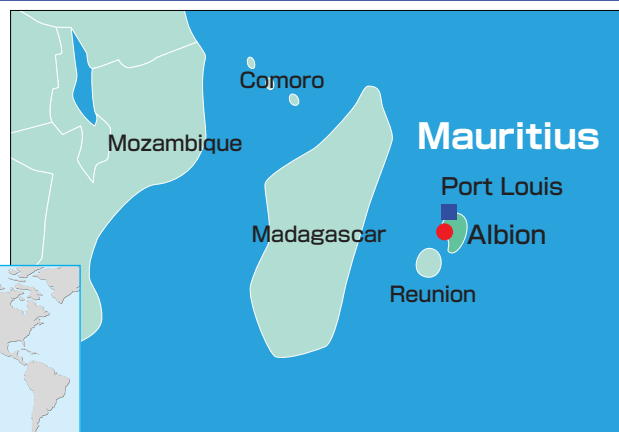
### (1) Lessons Learned

The project was implemented successfully because coordination between the governments of Japan and Mali had been smoothly done and the community actively participated. The government of Mali appreciated this project as a successful case of public and community participation for development planning. They have been conducting the development research for the improvement in urban water supply systems in Bamako and surrounding areas. This project should be referred to as a model for future urban water supply development projects in Mali.

### (2) Recommendations

The EDM made a request for counterpart trainings in Japan in order to expand their services and to improve efficiency of the facility operations and maintenance capacity. The Japan side should consider this request thoroughly to generate a synergistic effect from this project.

# The Coastal Fisheries Resources and Environment Conservation Project



Project Sites Albion

## 1. Background of Project

Japan has provided technical cooperation through experts since 1991, based at the Albion Fisheries Research Center (AFRC) constructed in 1982 and at a shrimp culture center constructed in 1986 by grant aid. Mauritius is an important fishery base in the Indian Ocean, and its citizens rely on fishery products for approximately 40% of their animal protein intake. Also, due to the remarkable development of the tourism industry, the demand for coastal seafood has drastically increased in recent years. In its Sixth National Development Plan (1992 – 1994), the Government of Mauritius recognized the importance of basic studies for sustainable fisheries development, and regarded AFRC as a center to preserve coastal resources and the environment.

Under these circumstances, the Government of Mauritius, recognizing the necessity of training AFRC researchers to enhance its capability, requested project-type technical cooperation from Japan, which had provided support for the AFRC in the past.

## 2. Project Overview

### (1) Period of Cooperation

1 December 1995 – 30 November 2000

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

The Albion Fisheries Research Center (AFRC)  
Ministry of Fishery and Cooperatives

### (4) Narrative Summary

#### 1) Overall Goal

To continuously utilize coastal fisheries resources and conserve the coastal environment in the Republic of Mauritius.

#### 2) Project Purpose

To systematically strengthen research capabilities

of the Albion Fisheries Research Center in the field of coastal fisheries resources propagation, and research into the coastal ecosystem and environment.

### 3) Outputs

- Method of stable mass seed production is improved.
- Suitable release and culture techniques in barachois<sup>1)</sup> are studied and acquired.
- Induced spawning techniques are established.
- A coastal environment monitoring system is established.
- Methods of coastal ecosystem research and monitoring techniques are improved.

### 4) Inputs

#### Japanese Side

Long-term experts	9
Short-term experts	14
Trainees received	14
Equipment	137 million yen
Local cost	26 million yen

#### Mauritian Side

Counterparts	12
Land and facilities	
Local cost	10.2 million rupees (Approx. 50 million yen)

## 3. Members of Evaluation Team

### Team Leader:

Akira NIWA, Director, Fishery and Environment Division, Forestry and Natural Environment Cooperation Department, JICA

### Resource Propagation:

Taira MATSUOKA, Technical Advisor, Overseas Fishery Cooperation Foundation

### Coastal Ecosystem Research:

Satoshi NOJIMA, Assistant Professor, Kyushu University Graduate School

**Planning and Management:**

Hiroyuki TANAKA, Fishery and Environment Division, Forestry and Natural Environment Cooperation Department, JICA

**Evaluation Analysis:**

Kunio NISHIMURA, CRC Overseas Cooperation Inc.

**4. Period of Evaluation**

24 June 2000 – 12 July 2000

**5. Results of Evaluation****(1) Relevance**

The fisheries development policy in Mauritius has been to promote the fishing industry while preserving the environment and resources, which is consistent with the purpose of the Project. This Project is relevant since capacity enhancement of AFRC, with its added function as a is essential for for preserving the fisheries environment.

**(2) Effectiveness**

The project purposes have mostly been achieved, as shown by the facts that the knowledge and techniques of AFRC staff improved, and that equipment and facilities were also upgraded. However, in the field of resource propagation, due to the unexpected outbreak of malformed fish and epidemic diseases, stable seed production of flat bream and mangrove crab<sup>2)</sup> could not be achieved. As for the field of coastal ecosystem research, due to such a variety of coastal creatures, studies on conservation of coral reef, a matter of global importance, have just started.

**(3) Efficiency**

Most of the inputs were prepared on schedule, except that it took some time to develop local procurement routes, follow custom procedures and tax benefits measures for certain equipment.

In the latter half of the Project, there was some delay in the schedule, which was caused by an increase in research frequency and operation volume requested by other institutions as the counterpart's research capabilities were improved. The delay resulted in the reduction of time allocated for technical transfer and thus affected the project progress.

**(4) Impact**

Through this Project, private sectors made attempts to cultivate black tiger shrimp<sup>3)</sup> and flat bream. Distribution of posters and holding seminars improved awareness of local people on the importance of the coastal ecosystem and environment conservation. Rippling effects were also observed in neighboring French Reunion, where they began propagation tests with flat bream seeds developed by the AFRC.



Installation of a coral setting board

**(5) Sustainability**

As coastal environment research has become increasingly important, and the AFRC is ensured of enough funds to play a role as a responsible institution for coastal environment research. Most of the trained staff remain at the AFRC and thus the retention rate is high. Thus, institutional and financial sustainability is guaranteed. As for technical sustainability, the AFRC is capable of conducting research by itself, except for resource propagation and coastal ecosystem research.

**6. Lessons Learned and Recommendations****(1) Lessons Learned**

As capabilities of an implementing organization improve the workloads of the organization tend to increase, which may result in the lack of time for technical transfer from experts to counterparts. Thus, these circumstances should be taken into consideration when planning a project in the future.

**(2) Recommendations**

To ensure that the Project meets its initial purpose, more cooperation is needed to improve techniques on stable seed production and coral reef conservation research.

Mauritius should continue to publicize the research results, secure the budget for AFRC, maintain equipment and facilities, allocate an appropriate work force according to the workload, and set proper labor hours.

**7. Follow-up Situation**

Based on the recommendations above, three long-term experts have been assigned, from December 1, 2000 to November 30, 2002, conducting follow-up cooperation on the resource propagation and coastal ecosystem research.

<sup>1)</sup> Barachois is an embankment created in mangroves for culturing.

<sup>2)</sup> As these seafood are highly valued in the market, they are promising for culturing in Mauritius.

<sup>3)</sup> Same as the above.

# Karey-Gorou Green Promotion Cooperation Project



Project Sites Karey-Gorou

## 1. Background of project

In the 1980s, Japan proposed the concept of a "Green Peace Troop" in response to the growing domestic awareness on the food crisis in Africa caused by the aggravating desertification. In order to put the proposed concept into practice, JICA sent a study team to Niger, where afforestation and the improvement of living conditions in rural communities are key policies.

This study officially recognized the necessity to recover vegetation and to prevent desertification of Niger. In August 1990, both the Nigerian Ministry of Water and Environment and JICA agreed to dispatch a JOCV team to the Karey-Gorou district in order to promote and implement agro-forestry with community participation.

## 2. Project Overview

### (1) Period of Cooperation

1 January 1993 – 30 June 2001

### (2) Type of Cooperation

JOCV Team dispatch program

### (3) Partner Country's Implementing Organization

Ministry of Environment and Desertification Prevention

### (4) Narrative Summary

#### 1) Overall Goal

The afforestation activities of residents in the targeted areas are promoted

#### 2) Project Purpose

The living conditions of the local community are improved, and the importance of afforestation is understood by the community in order to promote regional afforestation

#### 3) Outputs

a) The natural environment and ways to improve it

are understood.

- b) Necessary technical skills on afforestation are obtained.
- c) Agro-forestry are widely implemented.
- d) Vegetable farming skills and sales are improved.
- e) Improved fruit culture are mastered and the income is increased.
- f) Residents are taught how to produce and use improved furnaces.

### 4) Inputs

#### Japanese Side

JOCV members	33
Trainees received	9
Equipment	7 million yen
Local costs	1 million yen

#### Niger Side

Counterparts	2
Land and facilities	

## 3. Members of Evaluation Team

### Team leader:

Yoshio HORIUCHI, Deputy director, Komagane Training Centre, JICA

### Evaluation plan, aid to group leader:

Yoshifumi TSUKII, International cooperation expert, general agriculture

### Organization and planning:

Chie MIYAHARA, Second Overseas Assignment Division, Secretariat of JOCV, JICA

### Project output analysis:

Mie MARUYAMA, International Development Associates

## 4. Period of Evaluation

10 December 2000 – 20 December 2000

## 5. Results of Evaluation

### (1) Relevance

The selection of the project site was appropriate, however, the project was mostly conducted by the Japanese side with little assistance by the Niger government. Despite above, the overall relevance was high for this project, which aims for afforestation and the improvement of local living conditions, which are the key policies of Niger since the 1970's.

### (2) Effectiveness

Although each village differs in degree, the living conditions of the community were improved by vegetable and fruit seedling cultivation introduced through this project. Moreover, the use of improved furnaces saved 100kg of annual firewood consumption per person, and the time needed to boil one liter of water was reduced to 24%.

As the number of participants in tree planting activities increased annually, the supply of seedlings increased to reach 337,000 by the project's completion. Considering these facts, this project achieved its goals.

### (3) Efficiency

At the initial stages of the project, the dispatch of a JOCV for fruit-growing was delayed and the number of counterparts was insufficient. However, this did not hinder the project operations because they were alternated by a JOCV from a different field and local representatives, respectively.

Since the local needs were not fully understood when the project was planned, some of the nursed seedling varieties had limited demand. However the project efficiency was achieved by the appropriate advice of the local support committee to control the number of those varieties in the last half of the project.

### (4) Impact

After the project, afforestation activities were extended not only in Karey-Gorou but to the surrounding areas. Number of planted trees other than the distributed by the project have also increased by the efforts of the local residents. It has been reported that 800 trees were planted in 2000.

### (5) Sustainability

Although the Nigerian government continues to put emphasis on afforestation for improving the local living conditions, it will be difficult to maintain the scale of the



Efforts for greening the district

management and budget of this project.

Though the local people understood the benefits of the skills introduced, only a few were able to master them due to its difficulty. Since the central nursery does not distribute seedlings for free after the project, sustainability cannot be expected without technology transfer and the establishment of a production system for seedlings. For these reasons, sustainability of this project is low.

## 6. Lesson Learned and Recommendations

### (1) Lessons Learned

The positive attributes of dispatching teams of young and not necessarily experienced JOCV are that they are able to achieve certain results by setting clear goals for a specific period under the supervision of experts. The secretariat and overseas offices should support JOCV teams in order to enhance their future performance.

To avoid any decrease in project efficiency, it is necessary to conduct a survey of local needs prior to the project and to continuously monitor the change of local awareness.

### (2) Recommendations

It is necessary to re-examine the local needs to determine the necessary input for continuing the project. Furthermore, the outcomes of this project should be fully understood by regularly implementing ex-post studies and comparing similar projects implemented in other countries.



# Improvement of Bridges of Trunk Roads



Project Sites Mtwara, Mingoyo

## 1. Background of Project

In 1990, the southern areas of Tanzania, Mtwara, Mingoyo, and Masasi suffered heavy damage from big floods. According to the survey conducted by the Tanzanian government from 1991 to 1992, fifteen bridges located on the main trunk roads connecting these three areas were washed away. Although some bridges were temporarily fixed, the others were left damaged, which affected the socio-economic activities. In 1995, the Tanzanian government requested Grant Aid from Japan for the improvement of bridges on trunk roads. Receiving the request, a basic design study team was dispatched from August 1996. Based on their report, it was decided to provide aid for reconstructing four bridges, which were located between Mtwara and Mingoyo. In 1997, Exchange of Notes (E/N) was concluded on the Grant Aid for "The Project for Improvement for Bridges on Trunk Roads".

## 2. Project Overview

### (1) Period of Cooperation

FY1996 – FY1998

### (2) Type of Cooperation

Grant Aid

### (3) Partner Country's Implementing Organization

Ministry of Works

### (4) Narrative Summary

#### 1) Overall Goal

- Improvement in the safety and reliability of the road along the southern shore.
- Improvement of socio-economic activities such as transportation of agricultural products, education, health, and the access to water.

- Reduction of intra-regional economic disparities.
- Improvement in the living standards of the residents of the State of Mtwara and Lindi.

### 2) Project Purpose

Transportation and distribution system is improved by the good and secure road, which can be used throughout the year.

### 3) Outputs

In the Mtwara and Mingoyo section, trunk-road bridges over which large-sized vehicles loading 1,180t such as trucks or buses can pass are reconstructed.

### 4) Inputs

#### Japanese Side

Grant	1.84 billion yen (E/N amount)
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#### Tanzanian Side

Local cost	7 million yen
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## 3. Members of Evaluation Team

JICA Tanzania Office  
(Commissioned to Tanzania Industrial Studies and Consulting Organization)

## 4. Period of Evaluation

19 November 2000 – 23 November 2000

25 March 2001 – 29 March 2001

## 5. Results of Evaluation

### (1) Relevance

From the aspect of socio-economic development of Tanzania, the reconstruction of the bridges damaged by

the flood in April 1990 was an urgent and extremely important project. The four bridges located between Mtwara and Mingoyo were targeted because they had relatively heavy traffic and severe damage. Moreover, the four damaged bridges affected the residents of the area. Therefore the four bridges were chosen to be fixed through this project. These facts prove that this project was relevant.

### (2) Effectiveness

In June 2000, compared to the situations in August 1996, the number of the cars using the trunk road per day increased five-fold, and vehicle driving time was also reduced by 60%. In addition, safety and durability were secured by implementing the international standardized materials for bridge construction.

### (3) Efficiency

The resources, such as constructing machinery and local workers, were efficiently input, and the construction was generally done ahead of schedule,

### (4) Impact

In the two states of Mtwara and Lindi, socio-economic activities were improved, and the activities of micro-enterprises were also expanded. Accordingly, several economic activities were stimulated. Increased agricultural products transportation, such as the export of cashew nuts from the Mtwara port increased from 43,674 tons in 1995 to 104,991 tons in 1999. Social services such as education, health, and water supply were improved, and the standard of living was also improved. In addition, a total of 624 local people were employed in the construction.

### (5) Sustainability

It is expected that the knowledge and techniques learned by the local people through the training for this project and the experience will be used in projects similar to this in the future. However, there has yet to be allocated the budget for the maintenance and management of newly constructed bridges, and maintenance equipment are insufficient. Moreover, it is pointed out that regular inspections and maintenance is even more important than before, with the increased traffic of the heavy-loaded vehicles. The Tanzanian government established the Tanzanian Road Public Corporation (TANROADS), and is trying to maintain the trunk roads and enhance the management of maintenance.



The constructed bridge on a trunk road (Mkindani bridge)

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

Good cooperative relations with the counterpart, the Tanzanian government, resulted in the success of the project. For the execution of the similar projects, it is necessary to monitor the correspondence of the beneficiary country of the assistance, to get the counterpart actively involved in the project, and to share knowledge and ownership.

### (2) Recommendations

The Tanzanian government must enhance the system for the operation and maintenance of roads and bridge. For this purpose, through the Ministry of Works, it is necessary to prepare the necessary budget and equipment for TANROADS, to inform the local residents, and to erect traffic signs.

It was observed that socio-economic activities were stimulated through the reconstruction of the four bridges among the 15 bridges destroyed by the flood.

# The Infectious Disease Control Project

**Project Sites** Harare City, 8 Districts (UMP, Hurungwe, Mt. Darwin, Lupane, Bulilimamangwe, Gukwe, Chipinge, and Mwenezi)



## 1. Background of Project

In Zimbabwe, infectious diseases have been among the top causes of deaths to people of all ages, and the control of these diseases has been placed as one of the most urgent issues of Zimbabwe's national plan. To promote government projects on the prevention of infectious diseases, the Government requested of Japan a project-type technical cooperation in 1995. The requested cooperation was in areas of epidemiological survey, the development of a nation-wide diagnosis and analysis system, and strengthening of the Ministry of Health and Child Welfare (MOHCW) and its inspection stations for malaria, TB, schistosomiasis, HIV, and Acute Respiratory Infections (ARI). In response, the Government of Japan implemented this Project in order to strengthen capabilities on epidemic tests, diagnosis and epidemiological data analysis for schistosomiasis and malaria.

## 2. Project Overview

### (1) Period of Cooperation

1 July 1996 – 30 June 2001

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Ministry of Health and Child Welfare (MOHCW)

### (4) Narrative Summary

#### 1) Overall Goal

The major infectious disease control activities of the concerned sections of the MOHCW are strengthened.

#### 2) Project Purpose

- Major specified infectious diseases such as malaria and schistosomiasis are controlled in the eight model districts.
- The existing draft of the National Schistosomiasis Control Policy is formalized based on the Pro-

ject's experiences.

### 3) Outputs

- In malaria control, 1) case management is improved, 2) community awareness and participation are improved, and 3) insecticide treated mosquito net (ITMn) is promoted.
- In schistosomiasis control, 1) the existing draft of the National Schistosomiasis Control Policy is formalized and adopted by Provincial Medical Directors, 2) case management is improved, and 3) awareness and participation of school children are improved.

### 4) Inputs

#### Japanese Side

Long-term experts	8
Short-term experts	9
Trainees received	11
Equipment	167 million yen
Local cost	37 million yen

#### Zimbabwean Side

Counterparts
Equipment
Land and facilities
Local cost

## 3. Members of Evaluation Team

### Team Leader/Malaria:

Hiroshi TANAKA, Professor Emeritus, Tokyo University

### Schistosomiasis:

Yoshiki AOKI, Professor, Department of Parasitology, Institute of Tropical Medicine, Nagasaki University

### Evaluation & Analysis:

Kimiko ABE, International Development Center of Japan

### Cooperation Planning:

Hiroko TANAKA, Second Medical Cooperation Division, Medical Cooperation Department, JICA

## 4. Period of Evaluation

3 December 2000 – 21 December 2000

## 5. Results of Evaluation

### (1) Relevance

The project purpose was consistent with the policies of Zimbabwe as well as the needs of the people; it is therefore considered relevant.

### (2) Effectiveness

As a result of technology transfer, activities to control malaria and schistosomiasis in the model districts have strengthened.

It is notable that "School, Screening, Treatment and Education" (SSTE)<sup>1)</sup> was implemented. SSTE was widely accepted by counterparts as a reasonable and easy approach for schistosomiasis control. Experts provided SSTE training to the staffs of all 131 local health centers in model districts, and to district and provincial level health officers. These trained staffs conducted SSTE at 78.9% of all 631 primary schools in the model districts within the period of two years. Moreover, 83.9% out of 102 thousand enrolled school children underwent screening, and 99.4% of infected children were treated.

Also, with the project's appeal, a policy measure on a national schistosomiasis control was formalized for the final draft, thus the effectiveness of this project can be seen.

It will take time until the ITMn promotion shows any effects, since the people had never used mosquito nets before 1994.

### (3) Efficiency

The inputs were generally efficient, but some factors hindered efficiency: the time required for selecting model districts and activities, reluctance on the Zimbabwe side to bear local costs for schistosomiasis control, and travel restrictions to rural area due to political instability and lack of fuel.

### (4) Impact

Provincial health officers participated in project activities and therefore have the potential to expand similar activities to non-model districts in the province.

The MOHCW decided to use the health education materials and rapid diagnosis kit for malaria outside the model districts, and is planning to promote infectious disease control activities on a nationwide basis.

The MOHCW recognized the effect of schistosomiasis medicine used by the Project, and gave permission to stock it at health-center levels, instead of at district hospital levels. This change has enabled a wider perspective of SSTE activities.



A staff handing out cups for urine testing

### (5) Sustainability

Malaria control will be sustainable since the MOHCW has secured a permanent staff and program and the budget with WHO support. However, the organizational and operational sustainability of schistosomiasis control has not been completely assured since the Government has not yet adopted the policy on a formal basis. Positive aspects are the remaining possibility of a formal adoption of the policy, and the high motivation of local personnel in charge of SSTE implementation.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

At the early stages of the project, experts were classified broadly into two categories, epidemiologist and parasitologist, which caused each scope of the work to be too broad and unclear. In the later half, focus was given to malaria and schistosomiasis control, resulting in more effective activities. Clarification of the area of the project from the beginning is necessary for a more effective project management.

### (2) Recommendations

A follow-up survey to understand the effectiveness of the SSTE is recommended to encourage the approval of the Policy.

<sup>1)</sup> The basic flow of SSTE activity is as follows: The health center staff (health lab technicians or nurses) visit concerned primary schools, collecting urine from pupils, testing through the urine paper test method, and distributing medications to schistosomiasis positive children.

# Construction of Pediatric Facilities of Harare Central Hospital



Project Sites Harare

## 1. Background of Project

Child mortality in Zimbabwe can be as high as 73 out of 1000 live births (in 1998), and it is an urgent issue for the Government of Zimbabwe to improve the capability of the medical services for children. Under such circumstances, the Ministry of Health and Child Welfare established a policy to decrease child mortality to less than 50 out of 1000. As the concrete measure for the policy, a plan was made for the maintenance and the expansion of the facilities of the Harare Central Hospital pediatrics in the capital Harare. As for phase one, the construction of the facilities for the outpatient and the parts of the facilities such as the intensive care unit were completed by the cooperation of Canadian International Development Agency (CIDA). Regarding the phase two, the original plan was for the Government of Zimbabwe itself to construct the facilities and obtain the medical equipment. However, it was not possible due to a lack of the budget. Therefore, the request for the Grant Aid was made to Japan.

## 2. Project Overview

### (1) Period of Cooperation

FY 1995 – FY1997

### (2) Type of Cooperation

Grant Aid

### (3) Partner Country's Implementing Organization

Ministry of Health and Child Welfare  
Harare Central Hospital

### (4) Narrative Summary

#### 1) Overall Goal

Child mortality is reduced around Harare city

#### 2) Project Purpose

Child medical services are improved at the Harare

Central Hospital.

### 3) Outputs

- Pediatrics facilities at the Harare Central Hospital are constructed.
- Supply of medical equipment to the Harare Central Hospital pediatrics is procured.

### 4) Inputs

#### Japanese Side

Grant	1310 million yen (E/N amount)
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#### Zimbabwean Side

Land and facilities

## 3. Members of Evaluation Team

JICA Zimbabwe Office  
(Commissioned to Ernest and Young Associates  
(Private) Limited)

## 4. Period of Evaluation

February 2001

## 5. Results of Evaluation

### (1) Relevance

Since January 2001, the Government of Zimbabwe has given full exemption for medical service expenses for children of less than five years old. From this also, the strength of the concern of the Government of Zimbabwe about the child medical services can be observed. Since this project has the objective of reducing the child mortality of Zimbabwe, it can be evaluated as being in accordance with the stated policy of the Government of Zimbabwe on child medical care.

Moreover, high child mortality had been recorded in the Harare Central Hospital pediatrics, and therefore, the

installation of the medical facility and equipment were also the desires from the circumference residents and the pediatrics staff. From this also, the relevance of this project is extremely high.

## (2) Effectiveness

By this project, medical facilities such as operating rooms and wards were built, and the number of the beds increased from 81 to 102 in the internal medicine department ward, and from 45 to 51 in the surgical ward. Medical equipment such as an operating table and an X-ray inspection device are also made available. Accordingly, the number of child deaths decreased year-by-year, from 1,242 in 1999 to 1,164 in 2000. The rate of discharge from hospital was also improved by approximately 8% every year.

However, when observing the actual state of the practical use of the facilities and the equipment, a tendency can still be seen of depending on the facilities and the equipment that they are used to. This is because the staff of the pediatrics do not understand fully how to use the equipment, and there is equipment provided that has not been used. At the time of evaluation, when six months have passed after project completion, 35% of pediatric operations were conducted in the newly constructed operating room and 44% of equipment is used.

There is no doubt that a certain level of improvement was made in child medical service due to the project. However, regarding the establishment of the system on efficient operation and maintenance of the facilities and the equipment, room to improve still remains.

## (3) Efficiency

Regarding the pediatrics facilities construction work, it was possible to complete all the work within the planned period.

As for the procurement of medical equipment, there was no delay in the delivery schedule, and equipment were delivered as ordered in terms of quality and quantity. Based on the above, no problems occurred in procurement of equipment.

## (4) Impact

The consultation efficiency of the pediatrics has been improving, and the average number of consultations per day increased from 87.3 in 1999 to 95.3 in 2000. The number of outpatients has also been increasing. This indicates that this project is having a positive impact on the child medical needs of the area inhabitants.

On the other hand, when observing the sickbed operating rates, we can see that shortages are becoming clear, in the increase from 108% in 1999 to 111% in February 2001, and the tendency of one bed to be shared among several



A procured ambulance

people is getting stronger with the year. This high bed operating rate is caused also by external factors such as the change of government policy that made medical service free for children of under five years of age, and the patients was concentrated to the Harare Central Hospital, which does not require the letter of introduction. Therefore, the capacity of the pediatrics was not able to catch up with the increase in the number of patients.

## (5) Sustainability

When the increase in the number of sickbeds, the decline tendency of the child mortality, and so on, were observed after the cooperation is implemented, the meaning of the existence of the Harare Central Hospital pediatrics in the area will become even greater. In terms of continuing to be supported by the local people, the future sustainability of the pediatrics is recognized.

However, in terms of institutional sustainability, it is necessary for the pediatrics staff to manage the facilities and the equipment more efficiently. Gaining enough public financial support for the future maintenance of the condition of the facilities and equipment are important as well.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

Regarding training in operation of the equipment, the effect is small if it is not carried out just before the actual use. Since there are situations such as staff transfers, follow-up to execute the planned training even after the implementation of the project is necessary.

### (2) Recommendations

In order to improve the inefficient use of the facilities and equipment, it is necessary to arrange training opportunities for pediatrics staff members.

# The Beef Cattle Improvement Project



Project Sites Trinidad, Montero

## 1. Background of Project

In Bolivia, approximately 6 million heads of beef cattle, mostly indigenous breeds, are being raised. The productivity of these cattle had been low due to a crude breeding method, and improvements have yet to be attained. It is important for Bolivia, whose caloric intake per person is at the lowest level among the Latin American countries, to progress the productivity of beef cattle in order to improve their nutritional status.

Under these circumstances, the Government of Bolivia presented the following as urgent issues for the nation to accomplish: 1) ameliorate productivity through improvement of beef cattle, and 2) stabilize and further enhance the income of livestock farmers. Bolivia requested a project-type technical cooperation from Japan that aims for a well-planned introduction and improvement of high quality beef cattle and the increase of productivity by improving comprehensive feeding techniques.

## 2. Project Overview

### (1) Period of Cooperation

1 July 1996 – 30 June 2001

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Main site: Breeding Improvement Center of Gabriel Rene Moreno Autonomous University

Sub site: Breeding Improvement Sub-Center of Beni Technical University

### (4) Narrative Summary

#### 1) Overall Goal

The progress of productivity in beef cattle, the rise in income and the security of Bolivian farmers will be accomplished through the genetic improvement of beef cattle.

#### 2) Project Purpose

Through the enforcement of a planned introduction of superior Nelore, and related execute system, all feeding techniques for beef cattle, which include breeding, reproduction, and feed production, will be improved.

#### 3) Outputs

- a) Beef productivity is improved through systematized genetic improvement in the direct station testing of beef cattle.

- b) Genetic improvement in beef cattle is accelerated by an AI (artificial insemination) and ET (embryo transfer) technology transfer.
- c) Quarantine for introducing the animals is established in line with the sanitary technology transfer and by arranging the facilities.
- d) An annual grazing system is introduced by intensifying the use of electric fences.
- e) By acquiring grazing technology fit for grassland establishment and maintenance, the productivity of the forage crop and grass is improved.
- f) Because of the transfer of hay and roughage reservation techniques, the alimentary condition of the cattle is improved.
- g) The manuals of transferred technology for each field are accomplished.
- h) With the advanced technology, counterparts will be able to train technicians working with the beef industry.

### 4) Inputs

#### Japanese Side

Long-term experts	11
Short-term experts	22
Trainees received	21
Equipment	235 million yen
Local cost	78 million yen

#### Bolivian Side

Counterparts	22
Local cost	2.23 million U.S. dollars (approx. 275 million yen)

## 3. Members of Evaluation Team

### Team Leader:

Tadashi MATSUKAWA, Shirakawa Institute of Animal Genetics, Japan Livestock Technology Association

### Feeding Management and Forage Production:

Hiroshi TAKEMOTO, Director, National Livestock Breeding Center, Tokachi Station, Ministry of Agriculture, Forestry and Fisheries (MAFF)

### Policy and Cooperation:

Yuichi NAKAMURA, Chief of Project Cooperation Section, Technical Cooperation Division, Institutional Affairs Department, and General Food Policy Bureau, MAFF

### Evaluation and Cooperation:

Hidetaka FUNO, Deputy Director, Division of Livestock and Horticulture, Department of Agricultural

Development Cooperation, JICA

#### **Operation and Management:**

Noriharu MASUGI, Division of Livestock and Horticulture, Department of Agricultural Development Cooperation, JICA

#### **4. Period of Evaluation**

9 January 2001 – 19 January 2001

#### **5. Results of Evaluation**

##### **(1) Relevance**

It was appropriate for the project to have presented the bull performance testing method since there had been very few effective performance evaluation systems for breeding stock in Bolivia. Furthermore, they had developed organizations that operated the testing. These facts prove the relevance of this project.

##### **(2) Effectiveness**

In terms of genetic improvement Nelore was chosen as the type of breed that would be improved, as it was considered to be adequate to the local breeding circumstances. As a result, 726 grams of daily weight gain were recorded on average at the direct station testing of weanlings on pasture for 280 days. The results were highly appropriate because Nelore is commonly known as a slow-growing breed.

In areas of reproductive health and feeding management, they produced remarkable outcomes, such as technical manuals that contributed to establishing and extending the technology transfers to their counterpart. Thus, the technology in these areas are recognized as being well-transferred according to plan.

On the other hand, a part of the examination of pasture and forage crops has yet to be completed. However, it has been assumed that the objectives are also being accomplished.

##### **(3) Efficiency**

Bull performance testing was performed efficiently and in cooperation with large-scale livestock farmers, who loaned their best calves to the project. However, it might have been better if low-cost feeding management was transferred to the small and medium-sized farmers, as they comprise the majority of Bolivia's livestock industry.

Although the local cost, which was the responsibility of the Bolivian side, was occasionally handled in an inefficient manner, the operation was put forward steadily in the areas of reproductive health, feeding management, and forage crop production.

##### **(4) Impact**

The genetic improvement of beef cattle will have a large impact if bull performance testing is established. For feeding and management areas, techniques such as placing low-cost simple fences and providing supplemental roughage are extended and established, which some large-scale farmers have already applied. Some large-scale farmers are also taking advantage of the transferred techniques of efficient hay production adjustments.

##### **(5) Sustainability**

The counterparts understand the significance and method of bull performance testing for the genetic improvement of beef cattle, assuring the testing operation to make good progress.

It has been considered that the technologies for feed-



Embryo transferred calf and its mother

ing management will further progress with the development of a system that will accumulate data for technological improvement and develop applied technologies based on the data. It will be made possible by establishing cooperation with other existing institutions.

Pasture and forage crop production is expected to be sustainable while continuous systems and techniques for production have been established.

In addition, the beef cattle improvement center was integrated with the Livestock Artificial Insemination Center (CIABO), and operated as the National Livestock Improvement Center currently in order to sustain itself financially and strengthen the managing function.

#### **6. Lessons Learned and Recommendations**

##### **(1) Lessons Learned**

Participatory planning should be conducted with counterparts on the project formulation stage. Also, it is essential to conduct monitoring and evaluation regularly using the Plan of Operation and PDM.

##### **(2) Recommendations**

In order to improve accuracy and establish technologies, the bull performance testing should be performed at least two more times after the termination of this project.

Since this project could not transfer technologies to small and medium size farmers as it did to large-scale farmers, they are expected to be extended by the further efforts of the counterparts. So as to enhance sustainability, advice concerning organizational matters such as financial structures, as well as technical advice is needed.

#### **7. Follow-up Situation**

A follow-up expert has been dispatched as a "Beef cattle improvement advisor" from July 2001 for a period of two years. The expert would be performing the collective direct station testing and giving advice on the management of the Center that had been integrated with CIA-BO in July 2001. The aim is to increase the sustainability of the Project.



# Advanced Manufacturing Systems



Project Sites San Caetano do Sul

## 1. Background of Project

The Brazilian National Industry Support Services (SENAI: Serviço Nacional de Apoio à Indústria) established SENAI Manufacturing Automation Center in Armando de Aruda Pereira School to develop mid-level engineers in the product automation field in an effort to meet the Brazilian industry's needs. One of these needs has been to enhance their competitiveness by reducing production cost and improving productivity.

To foster engineers who are able to promote the introduction of a computer-driven production system, the government of Brazil made a request to Japan for technical cooperation. Responding to their request, the Japanese government carried out a Project-Type Technical cooperation, the "Manufacture automation center project," from 1990 to 1995, targeting the instructors of SENAI Manufacturing Automation Center.

As SENAI steadily built up work, the Japanese government assessed that SENAI had reached a level that enabled them to transfer technologies to surrounding countries. A Third Country Group Training was thus implemented in 1997.

## 2. Project Overview

### (1) Period of Cooperation

FY1997 – FY2001

### (2) Type of Cooperation

Third-country Group Training

### (3) Partner Country's Implementing Organization

National Industry Support Services (SENAI), Manufacturing Automation Center in Armando de Aruda Pereira school

### (4) Narrative Summary

#### 1) Overall Goal

Training participants introduce their acquired knowledge (the latest computer-driven manufacturing system technology) to the organization to which they belong, and promote usage of the system.

#### 2) Project Purpose

Training participants acquire the necessary knowledge for industrialization with automated manufac-

ture in metal machine manufacturing and other forefront technology

### 3) Outputs

- The fundamental principle of the forefront manufacturing system is understood, and the operation of CAD <sup>1)</sup> /CAM <sup>2)</sup> and the CNC <sup>3)</sup> machines is learned.
- The CNC machines and robots are programmed and operated, and the Flexible Manufacturing System (FMS) <sup>4)</sup> is understood.
- The basics of the control algorithm are understood, the Programmable Logical Control (PLC) <sup>5)</sup> is programmed and operated, and the control algorithm with servomotor is made.
- An automatic manufacturing system is integrated.

### 4) Inputs

#### Japanese Side

Instructors	5
Training expenses	31 million yen

#### Brazilian Side

Training expenses	1 million yen
Facility, equipment and instructors	

### (5) Participant Countries

Argentina, Bolivia, Colombia, Costa Rica, Ecuador, Mexico, Panama, Paraguay, Peru, Venezuela, Chile, Uruguay, and Brazil.

## 3. Members of Evaluation Team

JICA Sao Paulo Office

(Commissioned to Marcos de Sales Guerra TSUZUKI, Associate professor, Engineering Department, University of Sao Paulo)

## 4. Period of Evaluation

December 2000 – March 2001

## 5. Results of Evaluation

### (1) Relevance

This training program met the needs of the training instructors in the participants' organizations (educational institutions as vocational training schools and universi-

ties) as well as the needs of Latin America for industrialization. Regarding the recruitment, roughly twice the fixed number applied for the training each year.

The relevance of the Training is assumed to be high since the outcome relates to quality and productivity improvement, as well as economic growth and job creation. The expectations of neighboring countries are also high.

### (2) Effectiveness

It has been assessed that the training participants had learned forefront technology and gained knowledge necessary for automated manufacturing and industrialization based on the trainees' self-evaluation. They recognized that their skills in all areas (CNC, CAD/CAM, FMS and PLC) had improved after the training. However, as there were differences in the levels of the participants, the instructors had to conduct additional lectures.

### (3) Efficiency

Most of the training participants are satisfied with the contents of the training and the living conditions provided during the stay. Therefore, the input was appropriate both in quality and in quantity.

From August 1998, a new technology related to robotization was transferred to this center by aftercare cooperation for the period of two years. In fiscal year 1999, a training course on robotics was added to the training. This trial utilized the Japanese cooperation in a timely and effective manner.

### (4) Impact

The training participants made good use of the course textbook and training materials to diffuse their acquired knowledge, improving their work when they returned to their countries. Moreover, they carried out operational improvements in their organization by revising courses, and applying new contents and methods, such as industrial automation and mechatronics.

According to the questionnaire survey conducted on their organization, 85% of the respondents answered that they experienced progress in machine industry-related activities. Their organization appreciated the participants' achievements.

### (5) Sustainability

The facilities and equipment of SENAI Manufacturing Automation Center were satisfactory. They managed to renew part of the equipment and materials by themselves. The center recognized the importance of human resource development in manufacturing areas. Because instructors were of a high level and enthusiastic, they have sufficient ability to conduct training on their own.

However, it is difficult for SENAI to continuously implement a similar scale of training independently due to a gradual decrease of the SENAI budget, which corresponds to the Brazilian economy.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

In this project, there were differences in the level of trainees. This kind of problem should be solved by, for example, screening participants after providing distance education prior to the training, or selecting participants



Practical training on PLC Programming

from groups of organizations with a similar knowledge level.

Also for this project, as the participants' levels of comprehension were evaluated along with their attitudes and interest, not enough attention was paid to their level of achievement. Therefore, the only way to measure the achievement was by self-evaluation of the participants. When evaluating the participants in the future projects, attitude and knowledge should be separately considered.

### (2) Recommendations

Since CAD is used most frequently after the return of the trainees, the CAD/CAM lectures should be made more interesting.

In this training, there were participants who did not fully understand that robots, CNC machines and FMS contained PLC. It is necessary to adjust the contents and schedule of the lectures in order to give them better understanding.

## 7. Follow-up Situation

Based on the results of the cooperation to-date, the SENAI Manufacturing Automation Center in Armando de Aruda Pereira School continues to be regarded as the kernel of the Latin American region. In order to transfer forefront technology, a Third Country Group Training "International Manufacturing Automation" is scheduled with a five-year period starting in fiscal year 2002.

1) CAD: Computer Aided Design

2) CAM: Computer Aided Manufacturing

3) CNC: Computerized Numerical Control

4) FMS (Flexible Manufacturing System): The system in which the entire manufacturing system is managed with computers, and tries to make the manufacturing lines comply flexibly with the changes in the products and the amount of production.

5) PLC (Programmable Logic Control): One of the types of sequence control (A system in which a machine is controlled in accordance with the order and the conditions decided in advance), and the contents of the control can be changed in the same ways as the software.

# The Maternal and Child Health Improvement Project in North-East Brazil



**Project Sites** Fortaleza, State of Cear 

## 1. Background of Project

Health and hygiene indicators for Brazil has fallen in a range similar to those of middle-income countries when comparing the national average figures. However, there has been significant disparities within the nation, and northeast region was at the same level as the least less-developed countries. The Government of Brazil enacted the Unified Health System (SUS) in 1988 and began taking steps toward improving the medical care system. However, even the minimum level of medical service still could not sufficiently reach the poorest population in the northeast region.

Under these circumstances, the Government of Brazil made a request to Japan for a project-type technical cooperation aiming to improve maternal and child health services in Ceara, where the situation was the worst among the nine states in the northeast region.

## 2. Project Overview

### (1) Period of Cooperation

1 April 1996 – 31 March 2001

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Ministry of Health, Health Secretariat of the State of Ceara

### (4) Narrative Summary

#### 1) Overall Goal

Quality of the maternal and child health services in northeast Brazil are improved.

#### 2) Project Purpose

Quality of the maternal and child health services in the State of Ceara are improved.

#### 3) Outputs

- The level of awareness, knowledge, and technical abilities of the maternal and child healthcare providers in the State of Ceara are increased.
- The obstetric facilities in the hospitals in the pilot areas of the Project and the State of Ceara reference hospitals in Fortaleza are improved in line with the concept of "Humanized Maternity Care."
- The concept of "Humanized Maternity Care" is generally adopted throughout the State of Ceara.
- The awareness and behavior towards sexually

transmitted diseases (STD) prevention by people in the State of Ceara are improved.

## 4) Inputs

### Japanese Side

Long-term experts	8
Short-term experts	36
Trainees received	17
Equipment	146 million yen
Local cost	83 million yen

### Brazilian Side

Counterparts	17
Facilities	
Local cost	

## 3. Members of Evaluation Team

### Team Leader:

Takusei UMENAI, Graduate School International Health, Faculty of Medicine, Tokyo University

### Evaluation Planning:

Ritsuko SAKAMOTO, Second Medical Cooperation Division, Medical Cooperation Department, JICA

### Public Health:

Hiroyuki KAMATANI, Special Advisor, Second Medical Cooperation Division, Medical Cooperation Department, JICA

### Project Evaluation:

Shigemi TOKESHI, Environment and Occupational Health Institute

## 4. Period of Evaluation

9 December 2000 – 22 December 2000

## 5. Results of Evaluation

### (1) Relevance

Amongst the nine states in northeast Brazil, Ceara had the poorest status in maternal and child health, and its improvement was the priority of the Ministry of Health. Therefore, the project had high conformity with the policy of the Ministry of Health and the peoples' needs, thus giving it a high relevance.

## (2) Effectiveness

Intensive activities for seminars, workshops and trainers' training, and the launch of an International Conference on the Childbirth held in the year 2000 contributed greatly towards diffusing the concept of "Humanized Maternity Care," and triggered improvement in the quality of maternal and child health services in Ceara. From this angle, the project purpose was achieved well over expectations.

Of note, the training brought a change in awareness to the healthcare workers related to maternal and child health. Furthermore, the local birthrate and rate of normal delivery increased as a result, where 71% of the nurses and 85% of the auxiliary nurses underwent training sessions in the pilot area. According to the RAP (Rapid Anthropological Assessment Procedure) survey, it can be seen that the degree of satisfaction of pregnant women receiving delivery care service, and the degree of fulfillment by workers involved in delivery care service have risen.

However, there was some resistance from some obstetricians and the achievements were hindered in medical centers where they provide treatment. In addition, the nursing association raised objections against providing education for associate nurses.

## (3) Efficiency

Inputs were appropriate and taking the satisfactory achievement of the project into account, efficiency could be highly assessed. However, the arrangement of the counterpart staff at the Ceara State Health Secretariat was inadequate, and had some effect on its efficiency.

## (4) Impact

This project was widely known under the name "Project Luz (project of light)" throughout Ceara, and its national presence arose through such active public campaign as the international conference, as stated above. Therefore, the concept of "Humanized Maternity Care" attracted not only the surrounding countries, but also attracted other states within Brazil through its training sessions.

Moreover, this project also had an impact on the Government, and it led to establishing a national policy that extended the concept of "Humanized Health Care," which denies excessive medical intervention, to not only maternal and child health but all fields of medical care.

Grass-root networks consisting of workers involved in maternal and child health care, mothers, pregnant women and their families were being formed, and a greater sense of unity and organization of the supporters are expected.

## (5) Sustainability

Since the transferred techniques were utilized effectively and the knowledge and skill, which the counterpart had acquired through training, were shared with other health workers, technical sustainability can be considered high.

In addition, by Government ordinance, all state governments and municipal governments are obliged to allocate a certain share of their budgets to the health sector by the year 2004, therefore it is presumed that financial sustainability will also be satisfactory.

However, the Health Secretariat of Ceara, especially significant in the later half, was not cooperative and the concept of "Humanized Maternity Care" was not fully accepted. So there remain slight uncertainty in regards to the effort to apply the concept at the state government level, including the administrative and organizational



Care of a new born baby at a hospital

change in that direction.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

In projects where revolutionary change in the maternity health services takes place, as seen in the introduction of the concept of "Humanized Maternity Care" of the project, it is necessary to be fully aware of possible conflicts within the society. In such a case, thorough discussions would have a grave importance, even when there are differences in the opinions between the counterparts on the project purpose and the methods of its achievement. Also, steady and honest activities would gradually attract the frontline workers', users' and counterpart's favor and support the concept that the project is meant to deliver, possibly leading to the project effects.

This project was well accepted at the project sites and triggered the initiative of the local community. The initiative of the local community would often be a key factor for sustainable promotion of the newly introduced concept, therefore proactive approaches to enhance initiative are essential.

### (2) Recommendations

In the future, the support on exchanging information, knowledge, and experience in addition to technical cooperation must be considered to further promote "Humanized Maternity Care" in Ceara and other areas in Brazil. It is worth considering to further spread the same concept to other countries.

## 7. Follow-up Situation

A local NGO has been founded by the counterparts (obstetrician, nurses., etc.) at the project site who is actually involved in "Humanized Maternity Care" activities. Training activities are continued at the site by the NGO.

# Optical Fiber Transmission System



Project Sites Santiago

## 1. Background of Project

The "Digital communication training center project" was carried out from 1992 to July 1997 with the purpose of training of engineers in the electric communication field. The project brought advantageous effects in terms of training of capable trainers and establishment of training systems, etc., which had contributed to the development of telecommunications in Chile.

After the project, the government of Chile requested Japan to hold third country group training to improve the telecommunication services of Central and South America by taking advantage of the know-how and facilities provided through the project. In 1997, the government of Japan dispatched a project formulation study team. Then, on September 9, 1997, the cooperation for the third country group training in fiber optics was formalized with the signing an agreement.

## 2. Project Overview

### (1) Period of Cooperation

FY1997 – FY2001

### (2) Type of Cooperation

Third-country Group Training

### (3) Partner Country's Implementing Organization

National Telecommunication Center (CINCATEL)  
National Training Institute (INACAP)

### (4) Narrative Summary

#### 1) Overall Goal

To contribute to the social and economic growth of the countries of Central and South America, through the effective development of digital communication, which is spreading rapidly in the region.

### 2) Project Purpose

Technology and skills of fiber optic digital transmission, and furthermore, the techniques for laying fibre optic cables above or below ground are acquired.

### 3) Outputs

The trainees will study and acquire the following contents:

- a) Digital communication technology
- b) Optical transmission technology.
- c) Fiber optics digital technology (PDH: Plesiochronous Digital Hierarchy)
- d) Transmitting system technology (SDH: Synchronous Digital Hierarchy)
- e) Environmental technology for fiber optics (Optical Fiber Outside Plant technology)
- f) Other, various transmission technologies.
  - ISDN (Integrated Service Digital Network)
  - ATM (Asynchronous Transfer Mode)
  - FTTH (Fiber To The Home)

### 4) Inputs

#### Japanese Side

Short-term experts	5
Trainees received	12
Training expenses	27 million yen

#### Chilean Side

Training expenses	13 million yen
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### (5) Participant Countries

Argentina, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Dominica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.

### 3. Members of Evaluation team

JICA Chile Office  
(Commissioned to the local consultant, Munoz & Bri-  
ceno Consultants)

### 4. Period of Evaluation

January 2001 – March 2001

### 5. Results of Evaluation

#### (1) Relevance

The growth of the number of the Internet-host-computers in Latin America is extremely high in recent years, which is correlated with the competition for privatization in telecommunications companies. Fiber optics is an indispensable technology for the expansion of the large-capacity telecommunications network, so the technology transfer of fiber optics to third world countries through the training meets the needs of Latin American countries.

#### (2) Effectiveness

With regard to technology and knowledge, at the final evaluation all of the participants achieved the level aimed at the starting point. It can be said that the project purpose was accomplished.

#### (3) Efficiency

Although the facilities of CINCATTEL, which was installed by a previous JICA project in 1993, and the latest Japan-made equipment available at that time was used for the training. However, the equipment and the standard would eventually become outdated, since INACAP has not been able to update them despite the rapid progress in technology.

The operation and management system of AGCI, INACAP, and JICA were excellent. Each of these agencies knows their role, and contributed to achieve the project purpose and output by proper input and implementation. Also, the problem was solved by the proper arrangement of the coordinator so as not to affect to the operation and implementation.

#### (4) Impact

Despite the fact that about 80% of the training participants hadn't had any experience of dealing with optical fiber, after the training, they could engage in the work around fiber optics, making use of the technology and knowledge learned.

#### (5) Sustainability

INACAP had a similar experience of conducting a training program in Bolivia in 1999, and it has the capability of operating in any neighborhood areas.

However, INACAP does not fully recognize the importance of regular maintenance and inspection of the equipment, in addition, there isn't any definite manual of manipulation. Sometimes there are cases when the broken equipment had been left unseparated from the properly functioning equipment. It is necessary to build up the maintenance and inspection system for more effective use.

### 6. Lessons Learned and Recommendations

#### (1) Lessons Learned

In a project focusing on state-of-the-art technologies, such as fiber optics, etc., continuous investment in new equipment and new standards is necessary to keep in touch with rapidly evolving technical innovation.

Also, it is necessary to re-examine the contents of the training accordingly.

#### (2) Recommendations

It is necessary to make a written manual for maintenance and inspection of the equipment and manipulation.

Also, in order to meet the demands and to cope with the trend, it will be necessary to convert from the local standard to an international standard; i.e. ISO.

# Productivity and Quality Improvement



Project Sites Alajuela

## 1. Background of Project

The Minister of Foreign Affairs at the time, Mr. Kurarnari, visited the Republic of Guatemala in September 1987 and proposed the "Central America Human Resource Development Plan." It was a plan in which Japan cooperates with Central American countries to develop their human resources, to enhance peace and solidarity within the Central American region. Based on this plan, the Technical Instructor and Personnel Training Center (CEFOF) was established in Costa Rica with Grant Aid in FY 1989, and a Project-type Technical Cooperation, "the Technical Instructor and Personnel Training Center for Industrial Development of Central America" (FY 1992 – 1996) was executed at this center. The activities during the project were mostly domestic training, though there was a need to extend the project to other Central American countries.

Based on these circumstances, the government of Costa Rica requested the Government of Japan for a Third Country Training to improve knowledge and skills in productivity and project management in order to improve the competitiveness of small and medium enterprises in seven (and later eight) countries of Central America.

## 2. Project Overview

### (1) Period of Cooperation

FY1997 – FY2001

### (2) Type of Cooperation

Third Country Group Training

### (3) Partner Country's Implementing Organization

Technical Instructor and Personnel Training Center (CEFOF)

## (4) Narrative Summary

### 1) Overall Goal

The competitiveness of small and medium enterprises in Central American and Caribbean countries (Costa Rica and six neighboring countries) are improved.

### 2) Project Purpose

Participants' knowledge and skills in the field of productivity and project management are improved.

### 3) Outputs

- a) The following knowledge and skills, which are necessary for the leaders of enterprises and the region, are acquired by the trainees.

#### (1) Productivity Management

5S activities (arrangement, good order, cleaning, cleanliness, and discipline), cost reduction, problem solving techniques, scheduling, process and inventory control, etc.

#### (2) Quality Management

Quality improvement, quality control techniques, quality assurance, the fundamentals of testing, etc.

#### (3) Data Processing for Productivity

(only for interested parties)

- b) The CEFOF's organization management capability is developed.

### 4) Inputs

#### Japanese Side

Short-term experts	4
Local cost	31 million yen

#### Costa Rican Side

Counterparts	34
Local cost	12 million yen

### (5) Participant countries

Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Dominican Republic.

### 3. Members of Evaluation Team

#### Team Leader:

Masayuki TAKAHASHI, Central America and the Caribbean Division, Regional Department 3 (Latin America and the Caribbean), JICA

#### Evaluation Investigation:

Shinsuke KUBO, NEWJEC Inc.

### 4. Period of Evaluation

23 September 2000 – 2 October 2000

### 5. Results of Evaluation

#### (1) Relevance

The improvement of the competitiveness of small and medium sized enterprises is recognized as the fundamental building block of the economic development in Central America. The improvement of productivity and quality is closely related to the improvement of competitiveness.

Since twice the fixed number (42 per year) applied for the training (a total of 293 applicants), the contents of the training seem to meet the needs of the area. For the question in a questionnaire survey for participants, "Is the training in line with the needs of your country?" nearly all answered "Yes". The participants evaluate this training highly, thus this training is relevant.

#### (2) Effectiveness

Forty-two people participated every year as planned, and a total of 168 people successfully completed the training during the four-year cooperation period. According to a questionnaire to which 45 of the participants responded (26.8% response rate), for the question "To what degree did you acquire new knowledge and techniques through the training?", 40 out of 45 participants answered "Completely acquired", "Almost acquired", or "Fairly acquired", which accounted for 89% of the responses. For the question asking whether the participants utilize the acquired knowledge, techniques, and experience, the responses were "Utilize very much" or "Utilize". Therefore the training objectives are considered virtually achieved.

#### (3) Efficiency

The Japanese short-term experts who had given lectures in human resources management reported that the training was a success. However, because only seven hours are spent for each subject, and the course was given with Spanish interpretation some reported that the degree of understanding is in question. Corresponding to this, CEFOF is trying to reflect requests from the participants to revise the contents, and making other efforts to over-

come the deficiencies every year. There were no answers that pointed out drawbacks or inconveniences of the facility and equipment, which were also asked about in the questionnaire.

#### (4) Impact

According to the questionnaire, of 45 respondents, all except eight returned to their original workplace. Since the participants' career switch into other business sectors is not a problem, there are no major negative impacts to the project objectives. In the same questionnaire, 80% of the respondents were either "very satisfied" or "satisfied" with regard to the proficiency level, and the extent of usage and improvement of their knowledge and skills. This shows the participants utilization of the acquired knowledge and skills at work. Therefore, it is assumed that the participants' acquired knowledge and skills are contributing to the realization of the project's overall goal.

#### (5) Sustainability

CEFOF has many experienced lecturers and sufficient equipment and facilities and has a close network in Central America through the Federation of Central American Chambers of Industry. Including the training courses funded by the Inter-American Development Bank, CEFOF is giving seminars an average of 90 times per year outside of this project. Good relationships are also kept with higher-level organizations such as the Ministry of Economy. If appropriate financial assistance from relevant organizations are continuously secured, the training project will provide lasting benefits for the development as a center of productivity improvement and quality control in Central America and Caribbean countries.

### 6. Lessons Learned and Recommendations

#### (1) Recommendations

It is expected that CEFOF will enhance its role as a regional center of productivity improvement in Central America, in addition to improving productivity of small and medium enterprises and extending human resources development.

### 7. Follow-up Situation

A productivity improvement project is in operation for five years ending in January 2006, for technology improvement and service expansion of CEFOF.



# Small-Scale Fishery Development Plan in the Samana Area



Project Sites Samana Area

## 1. Background of Project

The Government of the Dominican Republic has placed importance on fishing as a source of protein of its citizens. In this regard, the "Plan to develop Coastal Fishery Resources" has been enforced with the aim of increasing marine product production and the steady supply of such products to the people.

On the other hand, most of the fishermen working in Samana Bay, in which 34% of the fisherman population is concentrated, are small scale and live below the poverty line. Based on such a background, the Government of the Dominican Republic requested cooperation from Japan to assist the self-reliance of the fishermen through means such as fishing practices, with the intention of establishing sustainable fishing guidance and training systems at CED-EP, which is the marine development training organization in the area.

## 2. Project Overview

### (1) Period of Cooperation

1 August 1996 – 31 July 1999

### (2) Type of Cooperation

Experts Team Dispatch Program

### (3) Partner Country's Implementing Organization

Centro de Entrenamiento y Desarrollo Presquero (CEDEP), Ministry of Agriculture

### (4) Narrative Summary

#### 1) Overall Goal

Small fishing is promoted in the Samana area.

#### 2) Project Purpose

The independence of those involved in small fishing in the Samana area is promoted by the improvement of the management and the execution system of CEDEP.

#### 3) Outputs

- a) The management and execution system of CED-EP is established.
- b) The technical level of the CEDEP staff members is improved by the training.
- c) The technical level of the fishermen of the Samana area is improved by the training.

d) Training materials are developed.

## 4) Inputs

### Japanese Side

Long-term experts	2
Short-term experts	4
Trainees received	5
Equipment	25 million yen

### Dominican Republic Side

Local costs	3 million yen
Land, facilities and equipment	

## 3. Members of Evaluation Team

JICA Dominican Republic Office  
(Commissioned to a Local Consultant: Eco Mar Program)

## 4. Period of Evaluation

Mid-February 2001 – March 2001

## 5. Results of Evaluation

### (1) Relevance

In the Dominican Republic, the fishing industry have provided the nationwide supply of the protein and played an important role. However, many fishermen were living below the poverty line. This project set as its goal the promotion of the self-reliance of small fishermen. The relevance in this sense was thus high.

Moreover, in Samana, there were many fishermen engaging in fishing out of economic need. Partly due to this, the fishing methods and equipment were problematic from the viewpoint of ocean resources protection, which was also considered by the project. There is a satisfactory level of relevance from this as well.

### (2) Effectiveness

In this project, the experts of the Japanese side made 26 kinds of training manuals in seven areas, and training was carried out. As a result the technical level of the CEDEP staff improved. However, the goal of establishing the management and operation system of CEDEP was not successful due to the lack of budget expenditure from the

Ministry of Agriculture and to the weakness of the management and financial administration of CEDEP.

The bottom long line fishing method introduced to the fisherman through the training. In comparison with the conventional fishing method, this method registered a 2.5 fold increase in efficiency and a 50% increase in the amount of fishing products and profit, which had a strong impression on the fishermen. The level of technology was thus improved. However, the number of fishermen participating in the training was confined to a small number – 56 people over three years.

From these facts, it is difficult to say that the objective of "the improvement of the technological level of the fishermen" is widely achieved. Based on this, the degree of achievement of this project as a whole is evaluated to be low.

### (3) Efficiency

As for the materials provided to CEDEP, they can be said to be appropriate in terms of type and quantity, and the timing of their provision was as planned.

However, on the other hand, the expenditure of the Ministry of Agriculture was confined to 18% of the budget plans of initially planned, and CEDEP sold the fishing products from the practical training for making up for deficiency with the revenue from the products. A situation occurred in which the staff members took time to sell the fishing product, although they were originally supposed to be engaged in practical training with the fishermen. Because of this, the average number of fishermen who were able to participate in the training was only as few as 17 per year, and the efficiency of the training can be evaluated as being low.

### (4) Impact

By the introduction of the new fishing method such as the bottom long line method, the operating depth of water deepened in the Samana area to 90-600m from the usual 90-300m, and it became possible to catch species of fish that were formerly difficult to catch. This developed the fishing possibilities of the Samana area, and it showed the opportunity that lies in the extension of technology related to fishing and new fishing methods. In this sense, this project had the positive impact.

However, in the Samana area, where 55 locations on the 300 km coastline are dotted with about 3,000 fishermen, and considering the fact that the number of the fishermen who participated in the training carried out by CEDEP was extremely small, it is difficult to evaluate whether or not this project had enough direct impact in terms of improving the socioeconomic conditions of the area.

### (5) Sustainability

The financial and management assistance by the government for CEDEP has been insufficient. The degree of independent financial development is also low, and the organization execution and management system of CEDEP is not fully established. By the sales of the fishing products, it tried to generate self-income resources. However, this resulted in straying from the original duty, which was to provide the opportunity for training for the fishermen. Therefore, the authority and the reputation of CEDEP



CEDEP

EP in the local fishing sector are low. In this sense, it is difficult to say that the degree of sustainability is high as a whole.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

In the case of fishing training for the fishermen, not only fishing method is taught, but it also is necessary to teach protection of fishing resources from a medium-term perspective, including the dangers of over-fishing. In other words, alongside learning methods for increasing the amount of fish caught is learned, it is also necessary to provide a good knowledge of fishing periods, locations and types.

In the fishing project, selling the fishing products and using the profits for the project execution costs should be avoided. By doing so, the organizational financial problems are not being fundamentally solved, and the original purpose of the project is not sufficiently recognized. Also, unnecessary competition may start with local fishermen in the sale of the fishing products. This may cause friction with the local community.

### (2) Recommendations

First, financial support must be secured fully. Second, in the occasion of the training, consideration is necessary for fishermen to have equal opportunity to receive the training by the means of making a fishermen registration list in the applicable areas. Finally, for the early solution of problems, a system to periodically carry out evaluation is necessary.

# Environment Preservation and Mineral Pollution Prevention Technology



Project Sites Tegucigalpa

## 1. Background of Project

In Honduras, where the level of economic development is lagging even compared to other Central American countries, the mining industry was attracting attention as a promising source for inviting foreign capital. Large mines, mainly of zinc and lead, and small and medium-sized mines, mainly of gold and silver, were in operation. However, the wastewater and material management were poorly carried out in these mines. For example, in Lake Yojoa, which is located in about 150km north of the capital Tegucigalpa, a deformed fish appeared due to the mineral waste water from the El Mochito mine near the lake. As described, the environmental pollution was in progress.

From such reasons, the Government of Honduras was concerned about this deterioration of the environment that was accompanying mining. They requested cooperation from Japan with the aim of introducing the proper technology for curbing the environmental pollution in the mining industry, and establishing proper mining management techniques.

## 2. Project Overview

### (1) Period of Cooperation

16 June 1997 – 15 June 2000

### (2) Type of Cooperation

Research Cooperation

### (3) Partner Country's Implementing Organization

Mines and Hydrocarbon General Directorate (DEFOMIN)

### (4) Narrative Summary

#### 1) Overall Goal

The mining industry development is promoted without causing contamination.

#### 2) Project Purpose

Joint study is conducted on the appropriate technology and on improving the skills and knowledge on environmental conservation, specifically on mining industry contaminant control.

#### 3) Outputs

- a) Research on present conditions of mining contamination.

- b) Improved technology on hazardous substances treatment by DEFOMIN.
- c) Environmental monitoring methods are established.

## 4) Inputs

### Japanese Side

Long-term experts	2
Short-term experts	8
Trainees received	2
Equipment	24 million yen
Local facilities	

### Honduran Side

Counterpart	16
Local cost	
Land and facilities	

## 3. Members of Evaluation Team

JICA Honduras Office

(Commissioned to a local consultant: ESA Consultores)

## 4. Period of Evaluation

9 February 2001 – 16 March 2001

## 5. Results of Evaluation

### (1) Relevance

Today, it is commonly recognized worldwide that it is necessary to give careful and full consideration to the preservation of the environment on the occasion of development. On one hand, the Government of Honduras holds expectations for the development of the mining industry as the core of national development. On the other, it is seriously considering how to curb the environmental pollution brought about by the development of the mining industry. This proves the fact that the Government of Honduras has a high level of awareness regarding sustainable development and the preservation of the environment. The project carries out direct cooperation for such points; therefore, it can be said that the relevance of the cooperation is high.

## (2) Effectiveness

In this project, a section that deals only with environmental preservation in the mining field, the "Environment Unit", was established inside DEFOMIN with cooperation of the Japanese experts. In the Environment Unit, Japanese experts carried out training and instructions, and cooperated in the making of two kinds of textbooks about chemical analysis techniques. According to interviews with the persons concerned in this project (13 people including two from the Japanese side), almost all the expected outputs are evaluated as having been achieved. For example, in the investigation related to "the actual condition of environmental pollution that originated in the mining industry," through techniques such as collection of information, field investigations, environmental specimen analysis, 245 specimens of water and soil were collected and analyzed in the total 78 mines. Hazardous substances such as heavy metals and zinc were detected.

## (3) Efficiency

According to the interviews on both sides of the project, more than 80% of the responses indicated that the setting of the purpose for this project and the scale of cooperation were appropriate. On one hand, as for the Japanese side experts, they were dispatched when necessary throughout the cooperation period. On the other hand, as for the first half of the year when the cooperation started, delays occurred in the arrival of the equipment and in the appointment of the Honduran counterparts. Also in Honduras, when the Government changes as a result of the Presidential election every four years, it is characteristic that official personnel and public servants will also be replaced. Sometimes the change of personnel, including the Director of DEFOMIN, had a negative impact on the efficient management of the project. Some had the opinion that although Japanese experts transferred the technology in Spanish, and an anticipated level of results was achieved, if their language skills were higher, it would have been more efficient.

## (4) Impact

In the mine areas, due to the activities of the Environmental Unit, raising of awareness about the environment was recognized in the community and in the local governments. Furthermore, because of the clear existence of environmental pollution in the mine areas, concern about the health of mine workers and local people has been rising. However, the Environment Unit does not have the authority to make any regulations against the mining industry. Therefore, for the purpose of controlling the environmental pollution, it could only have limited impact.

Information such as the actual conditions, the results of the investigation of the Environment Unit and the actual mining activities were provided for the community. This seems to be raising the level of environmental awareness of the local people.

## (5) Sustainability

It was decided to permanently establish the environment section within DEFOMIN as the environment preservation organization for the mining field in July 2000, when this project was to be finished. This decision was made



River water examination

based on the recognition that the research analysis section in this unit has the extremely eminent research analysis ability in the mining field in the country.

In DEFOMIN, the maintenance of the facilities and the equipment has been good. However, the management cost was attained with some difficulties. DEFOMIN is also considering the means of gaining self-income by providing services. However, it is still to reach the stage of self-sustenance. Moreover, reflecting the personnel affairs of Honduras, human resources who have accumulated training or experience tend to move. Therefore, on the point of the effective utilization of human resources, it can be said that there is a side that lacks sustainability.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

By trying to dispatch experts who can carry out instructions using the language of the dispatched area, efficiency can become even higher.

### (2) Recommendations

In order for the project to have sustainability, it is necessary to bring about a situation in which human resources accumulate knowledge and the training experience from the project. Furthermore, in order to minimize the potential of the environmental pollution in the mining industry, the Environment Unit should be given legal authority to set up regulations.

## 7. Follow-up Situation

From 2000, one long-term expert is dispatched as "a mine development adviser," and two short-term experts in "rules for pollution prevention" and one expert in "monitoring and waste water management technology" have been dispatched. Also from 2001, in-country training in "environment preservation technology" is being carried out with a schedule of five years.

# San Pedro Sula Water Treatment Plants Improvement Project in Honduras



Project Sites San Pedro Sula

## 1. Background of Project

The City of San Pedro Sula, located in the northwestern part of Honduras, is the second largest city with a population of 51,000 people (in 2001), and population increase is drastic due to the population inflow from the surrounding areas. Regarding the drinking water supply of the city, there was a serious problem originating in the decaying of facilities with a leak rate equivalent to 60% of the potential ability of water supply. The lack of sanitary water management capability, where surface water is only treated with chlorine sterilization, was also a problem. Especially in western areas, Santa Ana and Rio Piedras, the time when water was supplied was limited. According to a water survey including the remaining impurities value, the standards for water quality established by the World Health Organization (WHO) and others were not being satisfied. Thus, the Government of Honduras and the city of San Pedro Sula decided upon the "basic plan" for realizing a stable supply of safe drinking water in the city. A Grant Aid was requested to Japan in order to construct a water purification plant equipped with purification plants of slow-filtering method in both Santa Ana and Rio Piedras,.

## 2. Project Overview

### (1) Period of Cooperation

FY1994 – FY1996

### (2) Type of Cooperation

Grant Aid

### (3) Partner Country's Implementing Organization

San Pedro Sula Municipal Division of Water (DIMA)

### (4) Narrative Summary

#### 1) Overall Goal

The sanitary situation of the people of San Pedro Sula is improved.

### 2) Project Purpose

The capacity of DIMA to steadily supply safe drinking water is improved.

### 3) Outputs

- Water treatment plants in Santa Ana and Rio Piedras are constructed.
- Knowledge and skills of water supply among DIMA staff are improved.

### 4) Inputs

#### Japanese Side

Grant	2,121 million yen (E/N amount)
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#### Honduran Side

Land and electricity supply

## 3. Members of Evaluation Team

JICA Honduras Office

(Commissioned to a local consulting firm, ESA Consultores)

## 4. Period of Evaluation

1 March 2001 – 14 March 2001

## 5. Results of Evaluation

### (1) Relevance

The drinking water supply of the city of San Pedro Sula had problems in terms of water supply range, quality and stable supply capability. The capability to purify water directly relates to the sanitary conditions of the people, thus this project aiming for the improvement of the City's water purification plant is evaluated as responding to the concerns of the municipal authority and citizens of San Pedro Sula.

The relevance of this project was unexpectedly proven after the cooperation period when Hurricane Mitch hit San Pedro Sula in November 1998. The Hurricane was a

disaster that affected the lives of 2.2 million people, or one third of the country's population. However the processing ability of the two water purification plants fully recovered and water supply resumed within two days. There is a report that states that, without these water purification plants, the sanitary conditions of the people might have been much worse if the water supply had been cut for more than a month.

## (2) Effectiveness

The water purification plants improved the City's drinking water supply capability in fields of water supply range, stability of the water supply, and water quality. According to the statistics for 1995, only 61% of the inhabitants in Santa Ana and Rio Piedras were able to obtain safe drinking water throughout the day. After this project in 1999, this was improved to 96%, and in 2000 it became 89%. The amount of water purification was expected to be 25,000m<sup>3</sup> per day in the initial plan, but it reached an average of 27,600m<sup>3</sup>. Correspondingly, the amount of water supply per person was expected to be 210 liters, became 241 liters on average.

Before this project, because the medicine precipitation in the water purification process was not sufficient, residual coagulant, sulfuric acid aluminum was observed in the drinking water. However the water quality steadily came to satisfy the water quality standards of the WHO and others by the improvement of water purification plants.

## (3) Efficiency

The equipment introduced by this project can be evaluated appropriate in terms of quality and quantity. Although there were several pieces of equipment that had initial troubles, these were repaired by the Japanese constructor. All the equipment was installed and the construction finished as initially planned. During the construction period, DIMA had a meeting every week with the Japanese constructor. These meetings functioned well as the locus for the Project's decision making.

## (4) Impact

Socio-economic impacts from this project such as the decrease in the waterborne diseases to local residents are observed, due to the realization of a stable wide-range supply of safe drinking water. The completion of the water purification plant also made the full utilization of surface water possible so that the people do not have to depend on the high cost subterranean water.

In addition, the equipment specification was changed from a slow-paced filtration system to a rapid filtration system, accepting the proposal of the Japanese constructor. The latter has high processing ability in comparison to the original specification of DIMA, and fully demonstrates its functions when the original water is highly turbid. The arguments, skills, and methods of the Japanese construc-



Water treatment plant of Santa Ana

tors that were demonstrated at this proposal also became lessons to the DIMA staff, promoting technology transfer for the improvement of knowledge and technology of DIMA.

## (5) Sustainability

The management of the water purification plant by DIMA is recognized to be sustainable from the improved capabilities of the DIMA staff after the technology transfer by the Japanese constructors. However, since DIMA had not considered preventive maintenance method important, a sufficient system for maintaining the facilities has not been established.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

The equipment manual should be translated into the language of the counterpart country in order to increase the efficiency and the durability of the project.

### (2) Recommendations

For the maintenance and strengthening of the water purification capability, a technical evaluation system should be established by academic experts or engineers. Furthermore, in order to secure independent development, DIMA needs to establish a maintenance framework of the facilities.

## 7. Follow-up Situation

Based on the above recommendations, a total of 14 DIMA staff members have participated with the Group Training in the related fields in Japan.

# Earthquake-Resistant Design and Construction of Structure



Project Sites Mexico City

## 1. Background of Project

Latin America and the Caribbean region is of high seismic activity. In these areas, there are many small-scale residential buildings that lack resistance to earthquakes, and it is necessary to regulate the construction of the building by the appropriate Construction Standard Law and to diffuse low-priced and safe structures. However, due to the lack of financial resources, the number of the experts in earthquake-resistant design and construction is not sufficient.

After the major earthquake in 1985, the Government of Mexico requested Japan to cooperate in the research, training and diffusion of the technology related to disaster prevention, since Japan has vast experience in this field. Receiving this request, the Grant Aid had been implemented and "National Disaster Prevention Center (CENAPRED)" was constructed. Following the Grant Aid, the Project-Type Technical Cooperation, the "National Disaster Prevention Center Project", was executed for seven years from April 1990. After the Project was completed, new cooperation was requested by CENAPRED, and technical transfer in the fields of earthquake-resistance due to the fact that earthquake engineering to the neighboring countries was also desired. Thus, it was decided to implement a Third Country Group Training.

## 2. Project Overview

### (1) Period of Cooperation

FY1997 – FY2001

### (2) Type of Cooperation

Third-country Group Training

### (3) Partner Country's Implementing Organization

National Disaster Prevention Center (CENAPRED)

### (4) Narrative Summary

#### 1) Overall Goal

The earthquake-resistant design and construction technology for decreasing earthquake damage is improved and contributes to the social and economic development of the participant countries by training construction engineers in the countries of Latin America and the Caribbean.

#### 2) Project Purpose

To enhance the earthquake emergency capacity of the Latin America and Caribbean countries by transferring the technology and knowledge of the

earthquake-resistant design and construction transferred to CENAPRED through the Project-type Technical Cooperation by Japan.

### 3) Outputs

Trainees learn the following knowledge.

- Preliminary knowledge of seismology and application to earthquake-resistant design.
- Earthquake-resistant design technology and structure analysis method.
- Earthquake-resistant design and construction according to building structure, and evaluation method of the degree of resistance to earthquakes of existing buildings.
- Implementation of earthquake-resistant design and construction and the legal aspects.

### 4) Inputs

#### Japanese Side

Short-term experts	6 (1998 – 2001)
Training expenses	36 million yen (1997 – 2000)

#### Mexican Side

Training expenses	9 million yen (1997 – 2000)
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### (5) Participant Countries

Argentina, Belize, Bolivia, Chile, Colombia, Costa Rica, Cuba, Dominica, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Panama, Peru, Dominican Republic, Venezuela, and Mexico.

## 3. Members of Evaluation Team

JICA Mexico Office  
(Commissioned to Y. I. T. Asociados, S. C.)

## 4. Period of Evaluation

17 November 2000 – 23 March 2001

## 5. Results of Evaluation

### (1) Relevance

The level of knowledge and technology of CENAPRED as a training institution was high, and the researchers of CENAPRED appropriately grasped the seismic character and the needs of the surrounding countries. Thus, delivering knowledge related to earthquake-resistant design through Third-country Group Training was relevant.

## (2) Effectiveness

In the questionnaire survey, more than 80% of the participants in each training answered either "extremely so" or "very much so" to the question: "Have you obtained knowledge and technology through the training", which led to the high evaluation of the trainings.

However, according to the instructors, there were differences in trainee's understanding depending on the contents of the training and the organization to which they belonged (governmental organization, private companies, universities). For example, the level of understanding of the following course, "The Earthquake-Resistant Design, Construction and Law, and the Method of the Evaluation for the Resistance to Earthquake of the Existing Building" (especially concrete structures), was as low as 5 out of 10 points, and as for the difference in the level of understanding, the participants dispatched from governmental institutions received low evaluations.

## (3) Efficiency

In the questionnaire survey carried out by CENAPRED at the end of the training, 40-80% of the participants that responded gave marks of 5 out of 5 (very good) about the management of the training, and it was concluded that the evaluation was high. On the other hand, regarding the contents of the training, there were differences in the level of their understanding as well as the satisfaction depending on their countries, needs, technology level, and whether they were structure design engineers or the designers. There were requests for the lecture time to be extended for some subjects and for the textbooks to be upgraded.

Regarding the 4th training, it was implemented during the transition of the Mexican administration and the reorganization of CENAPRED. It became difficult for CENAPRED to execute the training along with the R/D (the record of discussions) due to the transition, so the Training was not smoothly executed. Besides that, the introduction of the computer program for structure analysis was delayed and could not be used in the Training due to late application of CENAPRED as well as the time required for the approval by JICA.

## (4) Impact

With regard to the questionnaire, 26 participants out of 47 (57%) answered that "The knowledge and technique learned through the Training could be utilized in the workplace."

## (5) Sustainability

CENAPRED carries out domestic training using almost the same contents as those of this training, and the materials left by the Japanese short-term and long-term experts are also utilized. It is said that transferred techniques are gaining ground in CENAPRED. Based on this, it is concluded that CENAPRED has the ability to implement training from the technical point of view. However, from the financial point of view, CENAPRED is in difficult conditions to prepare the budget to invite the trainees from overseas on their own. This can be a factor inhibiting the continuation of the training independently.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

During the "National Disaster Prevention Center Project" which was implemented prior to the Third Country Training, the researchers of CENAPRED properly grasped the seismic character of the surrounding countries and their needs. The construction circumstances of the neighboring



Seismography and volcano monitoring laboratory

countries were investigated, and these factors led to the high reputation of the Training and caused the increase in the number of applicants.

The report prepared by the Japanese long-term expert contains extremely useful information regarding the standards and guidance for existing buildings. However, printing to meet the demand has not been finished due to a shortage of budget. It would be preferable that JICA keeps the report and provides it directly to organizations or individual persons, so that the results of expert's efforts can be transmitted securely.

### (2) Recommendations

During this training, computers for large experiments and the seismometers were not well maintained due to the lack of budget of CENAPRED, but no serious troubles were caused on the Training itself. It will be necessary, however, to maintain these machines to continue with similar trainings.

With regard to the sustainability for the Training, it would be expected to secure the enough budget for invitation of the trainees within the budget of the South-South Cooperation of the Ministry of Foreign Affairs of Mexico.

As for the contents of the training, it seems effective to implement short-term training on earthquake-resistance diagnosis and reinforcement of existing buildings in accordance with the needs of each country.

## 7. Follow-up Situation

It is expected that Phase 2 of the Third Country Group Training will be requested. at the time of investigation request in fiscal 2003, after the management system of CENAPRED and the contents of the courses are revised.



# Integrated Production of Educational Television



Project Sites Mexico City

## 1. Background of Project

In Mexico, school education, pre-school education, adult education, and vocational education using TV broadcasting were considered important, in order to mitigate the decline of education quality caused by the regional disparities in education and by the chronic shortage of teachers.

Japan dispatched an expert to the Education Television Training Center of the Ministry of Education with the aim of improving the program production technology and the broadcasting technology and implemented Project-type Technical Cooperation (1991 – 1996) for the purpose of the establishment of the Educational Television Training Center (CETE). As a result of this project, CETE was able to have its own training center for the production of the educational TV programs, and could come to provide training for a wide range of related persons on educational programs in Mexico.

Mexico declared that it would provide the opportunity to improve the knowledge and technology of the technicians of Latin America and Caribbean countries in the field of production of educational TV programs in accordance with the joint declaration "Tuxtla II" at the conference by the leaders of Caribbean governments or countries. Mexico requested Japan to implement the Third-Country Training to spread the technology and knowledge transferred to CETE in the field of the production of the integrated educational TV program production to these countries.

## 2. Project Overview

### (1) Period of Cooperation

FY1997 – FY2001

### (2) Type of Cooperation

Third-country Group Training

### (3) Partner Country's Implementing Organization

Ministry of Education, Educational Television Training Center(CETE)

### (4) Narrative Summary

#### 1) Overall Goal

Through educational TV programs, the quality of education in Latin America and Caribbean coun-

tries is improved.

#### 2) Project Purpose

Educational TV program production capability of trainees from Latin America and Caribbean countries is improved.

#### 3) Outputs

- The trainees complete the practical training process from the planning to the production of high-quality educational TV programs
- The trainees (TV producers) gain knowledge of the production process of educational TV programs through learning the basics in pedagogy, program planning, and production system.
- The trainees (technical staff) gain the technical ability for working as part of a team through the production processes.
- The trainees (technical staff) learn to attain efficient communication methods through vivid images by the operation of the production machines.
- The trainees learn the integrated process of high-quality educational TV program production by a combination of both contents and the engineering sides of production.

#### 4) Inputs

##### Japanese Side

Training expenses	40 million yen
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##### Mexican Side

Instructors	19 people (1997-2000)
Training expenses	16 million yen
Facility maintenance cost	2 million yen
Equipment maintenance cost	5 million yen

#### (5) Participant Countries

Colombia, Costa Rica, Cuba, Dominica, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Panama, and Venezuela.

## 3. Members of Evaluation Team

JICA Mexico Office

(Commissioned to Y. I. T. Asociados, S. C.)

## 4. Period of Evaluation

17 November 2000 – 23 March 2001

## 5. Results of Evaluation

### (1) Relevance

Under the present situation in which educational TV programs and TV programs for culture are confused in many of the countries participating in the training, the relevance of the project purpose depends on how the situation develops at the related agencies of the countries participating in the training. Also, some of the trainees requested themes related to digital technology, and this reflects the fact that analogue based training machines installed in CETE are becoming obsolete in terms of the needs of the trainees.

### (2) Effectiveness

The final works of the trainees that clearly indicated that the acquired knowledge and techniques. According to interviews with the persons concerned with CETE training and the lecturers, these final works have reached the level that had been anticipated at the beginning and evaluated the trainees' achievement highly. The knowledge and the technology of the trainees for program production improved drastically, and it can be assumed that the results will be useful for their actual work after returning to their countries.

### (3) Efficiency

Since no problems were pointed out by the trainees with any areas of the contents of the lectures and the practices, the quality of the lecturers, the training machines and facilities, and the management of the training, CETE's ability to implement and manage the training are highly evaluated. However, at the beginning of the training, due to a delay in the administrative work, enough information was not sent to the countries participating in the training, and sometimes the application documents were not delivered until just before the start of the training.

### (4) Impact

In terms of the actual situation of the participating countries-educational TV programs and TV programs for culture are confused – it is difficult for the trainees to directly apply the techniques learned on returning to their countries. According to the questionnaire <sup>1)</sup> about the opportunity and the possibility of making use of the knowledge learned, many answered as favorable. However, a considerable number of negative answers were also given (out of a top mark of 5, 16 participants gave 5, 6 participants gave 4, 5 participants gave 3, and 3 participants gave 2 respectively). In the interviews conducted in Nicaragua and Panama, the shortage of machines and the lack of vision among the leading members of the organization to which the trainees belong are cited as the barriers.

### (5) Sustainability

Technology transfer has taken root in CETE, and their ability to implement training is high. Therefore, if the Educational Television Department of the Ministry of Education provides complete financial support, the same



Interview for the ex-trainees (Panama educational radio and television station)

type of training can be implemented. However, the awareness of the current leading members about the training in terms of financial sustainability seems to be weak. Therefore, the limits of the budget system in the Government of Mexico can be said to lead to factors limiting sustainability.

## 6. Lessons Learned and Recommendations

### (1) Recommendations

Regarding the problem about the delay on the Mexican side in carrying out administrative work, it is necessary to develop the application procedure by establishing contact networks between trainees returning to their countries along with the official procedure.

In order to raise the sustainability of the Third-Country Training, the system "South-South cooperation" that is implemented by the Mexican side, or the scholarship system of international organizations should be considered from the stage of planning.

When the second phase of this project is considered, it will be necessary to pay attention to the digitization of the machines.

## 7. Follow-up Situation

Seminars and forums have already been planned by the independent efforts on the Mexican side. In order to properly evaluate the results of the sustainability of the Mexican side, it is planned to dispatch a short-term expert related to the evaluation of educational TV programs in 2002.

<sup>1)</sup> The questionnaire covered ex-participants of the 1st to the 4th year. The response rate was 58.1%.

# Casting Technology at the Material Engineering Qualification Center



Project Sites San Luis Potosí

## 1. Background of Project

The mining industry and other important metal casting and manufacturing industries are concentrated in the State of San Luis Potosí, which is located in the central part of Mexico. The improvement of metal-related technology and the strengthening of the small and medium industries that have weakened since the early 1990's were indispensable to the development of these industries.

Autonomous University of San Luis Potosí has been providing technical consultants for those enterprises along with the state government. The University decided to establish a special institution for education, research and technical consulting in areas that were of interest to the industry. For the field of casting technology, the Government of Mexico requested technical cooperation from Japan.

## 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

Autonomous University of San Luis Potosí, Faculty of Engineering, Material Engineering Qualification Center

### (4) Narrative Summary

#### 1) Overall Goal

The Material Engineering Qualification Center plays a leading role in the development of the casting industry in San Luis Potosí state and its surrounding areas.

#### 2) Project Purpose

Human resources capable of training small and medium-sized enterprises in the casting industry of the project area are secured by the Material Engineering Qualification Center.

### 3) Outputs

Counterparts are able to collect data by using the experiment equipment of the following 1) to 4)

- a) The optimization of the casting design by computer simulations.
  - 2) The mechanism of the casting defective phenomenon and its countermeasure.
  - 3) Examination of a quality evaluation method for casting.
  - 4) Examination of a quality control method in the manufacturing process of casting.
- b) Counterparts are able to give lectures for seminars related to the casting technology based on items 1) to 4) above.
- c) The center builds the capacity to offer consultation to small and medium-sized enterprises in San Luis Potosí state by using the acquired data when they receive requests for casting examinations.

### 4) Inputs

#### Japanese Side

Long-term experts	1
Short-term experts	7
Trainees received	6
Equipment	30 million yen

#### Mexican Side

Counterparts	12
Land, facilities construction and equipment	Approx. 43 million yen
Local cost	6 million yen

## 3. Members of Evaluation Team

JICA Mexico Office  
(Commissioned to Y. I. T. Asociados, S. C.)

## 4. Period of Evaluation

17 November 2000 – 23 March 2001

## 5. Results of Evaluation

### (1) Relevance

The present Mexican casting industry consists of small and medium-sized enterprises. Although there are some exceptions, the innovation of new casting products and the reduction of defect rate are not dealt spontaneously. The goal of this project was that the center would play the leading role in casting product development and in quality control of the surrounding area. This top-down objective was adequate in this case.

Regarding the working plan for the technological transfer of this project, it was difficult to complete within the project period. One long-term expert had to handle both administrative and management duties, and counterparts lacked the basic knowledge required in this field since casting engineering was a new field for San Luis Potosí University. The reasons for this delay were that the plan was conducted without satisfactory reflection of the predicted obstacles identified by the preliminary study, and Mexico did not have an adequate base for receiving the cooperation. They underestimated the contents of a technical cooperation in the form of dispatching a team of individual experts.

### (2) Effectiveness

This center organized seminars on casting two or more times per year. Six seminars were held between 1999 and 2000, and three seminars and two training sessions were scheduled in 2001. The center also executed 62 examinations, which were commissioned from local enterprises between 1998 and 2000. Therefore, in the medium run, it is possible to achieve the project purpose of securing human resources.

However, preparing examination reports, which is regarded as very important in the industry, has been taking twice as much time as it supposed to be. Therefore, the actual needs of the enterprises have not been fulfilled. Based on this situation, the achievement level of the technology transfer is a little insufficient.

### (3) Efficiency

Dispatching experts, providing equipment, and training counterparts have taken place without any problems. The university was very cooperative in preparing the land and facilities, but hindered the execution of the project by its insufficient response in terms of the selection and installation of equipment and local costs.

### (4) Impact

Regarding the contribution to the casting industry, the center's performance has been limited only in the areas of executing commissioned examinations and preparing its report. Therefore, it would be difficult to say that the center plays a leading role in developing casting technology at the moment. However, according to the local casting industry, the establishment of the center has been recognized by the great impact given by the existence of Japanese experts in Mexico.



Facilities of the Autonomous University Faculty of Engineering. (Material Engineering Qualification Center at the second building from the left)

### (5) Sustainability

Presently, the center gains attention because of the technical training provided by the Japanese experts. However, there is concern that the industry will lose interest in the center once the project has been completed.

On the other hand, a group of small and medium-sized enterprises in Guadalajara, which has established the Institution for Casting Machine, is very interested in an interchange with the center. They show strong commitment to cooperating in strengthening the capacity of the center.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

In cases where only one long-term expert is dispatched, plans should be carefully made not to burden the expert considering the multiple tasks expected of experts. There will be work for both technical transfer and management as either a chief advisor or coordinator.

### (2) Recommendations

It is assumed that a follow-up by Japanese experts is necessary for further developing the center. It is important to execute interactive training with private companies. Experts who support such activity should have coordination skills and be familiar with the overall casting technology rather than a specific area.

## 7. Follow-up Situation

A follow-up started in May 2001 by a dispatch of a short-term expert for six months. In April 2002, a Senior Overseas Volunteer was dispatched.

# Project on Improvement Techniques for the Production of Vegetables in Morelos State



Project Sites Zacatepec

## 1. Background of Project

In Mexico's National Development Plan (1989 – 1994), modernization of agriculture is listed as an important goal, towards improving the agricultural productivity hence living standards of farmers.

Although Morelos State is a typical semi-savanna agriculture region and produces mainly corn, sugar cane and rice. Other vegetables such as onions, tomatoes, husk tomatoes, etc. are also produced in an area of approximately 20 thousand hectares. In recent years, while rice production has decreased, the importance of vegetable production has been increasing due to its proximity to the capital, Mexico City.

Under these circumstances, the Government of the United Mexican States requested project-type technical cooperation to Japan in March 1993 to improve production technologies and to diversify farm products in order to enhance competitiveness in commerce.

## 2. Project Overview

### (1) Period of Cooperation

1 March 1996 – 28 February 2001

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Secretariat of Agriculture, Livestock and Rural Development (SAGAR)

National Forestry, Agriculture and Livestock Industrial Research Institute (INIFAP)

Zacatepec Experimental Station (CEZACA)

### (4) Narrative Summary

#### 1) Overall Goal

Applicable and practical vegetable cultivation techniques are extended to key small scale farmers in Morelos State.

### 2) Project Purpose

Practical techniques for cultivation of vegetables in CEZACA, INFAP, and the techniques and knowledge of counterparts are improved. Improved techniques are verified and transferred to extension officers and key farmers.

### 3) Outputs

- Suitable crops and varieties of vegetables are selected and introduced.
- Disease and pest control techniques for vegetables are improved.
- Breeding techniques and seed and seedling production techniques for favorable varieties of vegetables are improved.
- Cultivation techniques of commercial vegetables are improved.
- Verification, training and extension materials for the above-mentioned cultivation techniques are improved.

### 4) Inputs

#### Japanese Side

Long-term experts	10
Short-term experts	17
Trainees received	16
Equipment	137 million yen
Local cost	57 million yen

#### Mexican Side

Counterparts	14
Land and facilities	
Local cost	181 million yen

## 3. Members of Evaluation Team

### Team Leader/Plant Protection:

Yoichi SEKIGUCHI, Vice President, Japan Agricultural Aviation Association

### Agricultural Administration/Breeding and Seed Production:

Tomoyasu SASAKI, Chief, Project Management Section,

Technical Cooperation Division, International Affairs Department, Economic Affairs Bureau, MAFF

**Vegetable Cultivation Techniques/Extension System:**

Masafumi WATANABE, Chief, Fruit Marketing Section, Horticulture Division, Agricultural Production and Marketing Department, Kyushu Regional Agricultural Administration Office, MAFF

**Evaluation Analysis:**

Kazuo TORII, Chief Engineer, Overseas Activities Department, Taiyo Consultants Co., Ltd.

**Plan Evaluation:**

Kenji KANEKO, Deputy Director, Agricultural Technical Cooperation Division, Agricultural Development Cooperation Department, JICA



Box packing at the demonstration field of Tomatoes

## 4. Period of Evaluation

17 September 2000 – 30 September 2000

## 5. Results of Evaluation

### (1) Relevance

The project purpose is consistent with the agricultural development plan of Mexico and Morelos State. It can also be determined that the project was relevant through the fact that it coincided with the research policy of INIFAP, which was to improve practical agricultural techniques for betterment of agricultural management.

### (2) Effectiveness

In the beginning of the project it required some time to begin the joint research, due to delay in maintenance of testing fields and miscommunication between experts and counterparts.

Afterwards, through the cooperation between the two parties, improvement of technology such as disease and pest control and breeding progressed. Also selection of suitable crops such as tomatoes, onions and husk tomatoes and selection of new crops such as cabbage, broccoli and cauliflower were made. Technical manuals of these crops were also created. Although further cooperation with related facilities for extension of these technical improvements is required, it can be concluded that the results of the project achieved the goals of the project.

### (3) Efficiency

Due to lean budget measures from Mexico and vacancy of a counterpart in the field of soil and fertilizers, some activities were delayed, but generally operation as first planned was smoothly enforced including the inputs from Japan, triggering achievement of the expected results.

### (4) Impact

Through field observations of CEZCA and training for extension officers and key farmers, the vegetable-cul-

tivating technology developed in this project was introduced to farmers, and is beginning to be used by them. By continuing these activities in the future the project impact would be extended throughout Morelos State.

### (5) Sustainability

The research enforcement system has been strengthened on the Mexican side, and research capability of vegetable cultivation of the counterparts has improved through the program. If training of young researchers and financial grounds are strengthened, sustainability can be expected.

## 6. Lessons Learned and Recommendations

### (1) Recommendations

Extension of the project or follow-up cooperation is not necessary due to the considerable technical improvements made in the area of vegetable cultivation.

However, in order to further extend the achievements obtained from this project to small-scale farmers, cooperation with the extension facilities is required and follow-up from the Japanese side in extension fields are considered necessary.

## 7. Follow-up Situation

As a response to the above mentioned recommendation and also by the strong request of technical extension of the Mexican side, a long-term expert will be dispatched for one year as a follow-up expert for the extension of project achievements.

# 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
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## 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 SENSEA 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)<sup>1)</sup>

### (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)
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#### 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.

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

# The Regional Fisheries Training Project



Project Sites Chaguramas

## 1. Background of Project

Trinidad and Tobago, a country of islands in the Caribbean Sea which has a fragile socio-economic foundation has been in the process of reviewing its economic policy of which fisheries development was an important part. Such development was being implemented in order to obtain foreign currency and raise the food self-support ratio by shifting its fisheries style from coastal fisheries to offshore fisheries. Fisheries development has been a common challenge for the Caribbean islands. With the cooperation of the UNDP and FAO, Trinidad and Tobago established the Caribbean Fisheries Training and Development Institute (CFTDI) in 1974 as a technical training organization for fisheries. Due to the lack of training equipment and trainers, however, activities of the CFTDI were being stagnated. Thus, the Government of Trinidad and Tobago requested a project-type technical cooperation from the Government of Japan, with the purpose of reestablishing the CFTDI and enhancing its function.

## 2. Project Overview

### (1) Period of Cooperation

1 April 1996 – 31 March 2001

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Caribbean Fisheries Training and Development Institute (CFTDI)  
Ministry of Agriculture, Lands and Marine Resources

### (4) Narrative Summary

#### 1) Overall Goal

The technical skills of fishery personnel in Trinidad and Tobago and other Caribbean countries are improved.

#### 2) Project Purpose

The technical skills and training courses of the CFTDI are improved, and the capacity of human resource in fishery-related areas is enhanced.

### 3) Outputs

- Technical skills and expertise of CFTDI staff are improved.
- Appropriate and extendable fishery techniques, including those for maintenance of marine engines, fish processing and quality control are acquired and accumulated at the CFTDI.
- An appropriate curriculum and texts are prepared in fishery-related areas.
- More sophisticated seminars can be held.

### 4) Inputs

#### Japanese Side

Long-term experts	8
Short-term experts	18
Trainees received	15
Equipment	164 million yen
Local cost	118 million yen

#### Trinidad and Tobago Side

Counterparts	11
Local cost	205 million yen

## 3. Members of Evaluation Team

### Team Leader:

Hajime KAWAMURA, Chief, Fishery and Environment Division, Forestry and Natural Environment Department, JICA

### Fishery Technology:

Tatsuro MATSUOKA, Faculty of Fisheries, Kagoshima University

### Marine Engine:

Masato HAMAGUCHI, National Fisheries University, Fisheries Agency

### Fish processing:

Haruka IIDA, General Manager, Food Processing Division, National Research Institute of Fisheries Science, Fisheries Agency

### Planning and Management:

Ikuo TAKEKAWA, Fishery and Environment Division, Forestry and Natural Environment Department, JICA

## 4. Period of Evaluation

4 November 2000 – 18 November 2000

## 5. Results of Evaluation

### (1) Relevance

The Government of Trinidad and Tobago has put importance on technical improvement for fishery staff even after the reorganization of the CFTDI, and stressed the significance of human resource development in the fishery sector.

The CFTDI has been so far the only technical training organization in the fisheries sector in the region, and is regarded as the only international training center that targets Eastern Caribbean countries. Given these facts, the project is deemed relevant.

### (2) Effectiveness

Technical guidance has been provided on eight items related to fishery technology including the vertical long-line fishing method, and the total number of participants of training courses amounted 755. In the marine engine field, technical guidance on seven items has been provided including maintenance of outboard engines (44 training courses and 559 participants in total). Broad technical guidance has been provided from that on methods of fish processing to frozen storage methods. Counterparts of each field have held seminars with knowledge and practical skills obtained in the training courses in Japan, and they valued highly as well as requests for further seminars from participants and their employers. As for preparation of textbooks and teaching materials, they are either in the process of being prepared or almost completed. Overall evaluation is that the project purpose was successfully met.

### (3) Efficiency

Although various training courses and types of technical guidance have been provided, efficiency of the project is evaluated as somewhat low. This is because Trinidad and Tobago set a high level of conditions on appointment of counterparts and it resulted in significant delay in staff allocation. It took two and a half years after the project initiation until the staffing was completed. During this period, counterparts who received training courses in Japan were transferred and training on the same issue on newly assigned counterparts were required. At the initial stage of the project, this kind of inefficiency was observed, but in the latter stage, the project was implemented smoothly and effectively with good teamwork among dispatched experts, and with diligence of counterparts.

### (4) Impact

Project activities covered a total of 25 items in fisheries-related areas. New techniques such as the vertical longline fishing method and diesel outboard engines were accepted by fishermen, as well as fried fish balls cooked as a trial have come to served at local hotels. As seen in



Practical training of bottom trawling

the above, the project had a significant impact.

### (5) Sustainability

There were uncertain factors in terms of project sustainability. For fish processing, a procurement route of materials is not secured for maintenance of provided equipment, which causes negative impacts. Financial sustainability is relatively high, however, there are many uncertainties in organizational aspects since it may have difficulties in coordinating and developing fisheries strategies due to the reorganization of the CFTDI.<sup>1)</sup> Furthermore, Trinidad and Tobago has not yet made a commitment that the reorganized CFTDI would continuously hire counterparts of the project. There are some uncertainties in terms of system maintenance to make good use of project outputs.

## 6. Lessons Learned and Recommendations

### (1) Recommendations

The CFTDI needs to reorganize itself smoothly, taking necessary measures for maintenance of equipment provided by Japan, and to consider stable and continuous employment of counterparts. The CFTDI should also encourage cooperation with other fields within the institute, and seek the improvement of technical skills and training curriculum. The encouragement of technical extension for the private sector, including fishermen and fish processing companies, is also needed.

### 7. Follow-up Situation

Based on the above recommendations, the second phase of the "Promotion of Sustainable Marine Fisheries Resource Utilisation" was started in September 2001, and broader cooperation has been provided.

<sup>1)</sup> Reorganization of the CFTDI is scheduled in September 2001. It will be integrated with the Maritime Training Division under jurisdiction of the Department of Agriculture, of the Ministry of Agriculture, Lands and Marine Resources.

# The Veterinary Laboratories Improvement Project



Project Sites Montevideo

## 1. Background of Project

The livestock industry in Uruguay is of significant importance as a contributing sector to Uruguay's export and is subject to governmental promotion measures. Low productivity of livestock caused by diseases not only affects farmers' income, but also trade to both domestic and international markets. Priority was given to improving the functions of the Division of Veterinary Laboratories (DILAVE), which is responsible for diagnosis of diseases and inspection and research on the hygiene of exporting livestock. However, DILAVE has been suffering from inadequate veterinary diagnostic techniques and aging equipment. Training and retention of staff were thus among the urgent needs of the country, therefore, the Government of Uruguay requested to Japan for project-type technical cooperation for a project to transfer skills on diagnosis of animal infectious diseases and to train technicians related to the subject.

## 2. Project Overview

### (1) Period of Cooperation

1 October 1996 – 30 September 2001

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Division of Veterinary Laboratories (DILAVE)

### (4) Narrative Summary

#### 1) Overall Goal

An effective system for the control or eradication of animal infectious diseases is established.

#### 2) Project Purpose

Veterinary diagnostic techniques are improved to detect animal infectious diseases rapidly and precisely.

#### 3) Outputs

a) Diagnostic techniques for the following are im-

proved: 1) histopathology, 2) diseases caused by mycotoxins, 3) clinical pathology; 4) microbial infections (including reproductive disorders); and 5) viral infections.

b) Appropriate laboratory animals necessary for diagnostic activities are supplied.

c) Improved diagnostic techniques are extended through technical guidance and seminars at DILAVE and related institutions.

### 4) Inputs

#### Japanese Side

Long-term experts	11
Short-term experts	21
Trainees received	21
Equipment	189 million yen
Local cost	61 million yen

#### Uruguayan Side

Counterparts	33
Land and facilities	
Local cost	71,738 USD (9 million yen)

## 3. Members of Evaluation Team

### Team Leader:

Yusuke TADA, Development Specialist, Institute for International Cooperation, JICA

### Pathology:

Makoto HARITANI, Head, Laboratory of Infectious Disease Pathology, Department of Pathology and Physiology, National Institute of Animal Health (NIAH), Ministry of Agriculture, Forestry and Fisheries (MAFF)

### Bacteriology:

Takafumi HAMAOKA, Head, Laboratory of Epidemiology, Department of Systematic Diagnosis, NIAH, MAFF

### Virology:

Hiroyuki OTOMO, Senior Veterinary Officer, Division of Animal Quarantine, Department of Animal Quarant-

tine, Animal Quarantine Service, MAFF

**Cooperation Policy:**

Yuichi NAKAMURA, Chief of Project Cooperation Section, Division of Technical Cooperation, Department of International Affairs, General Food Policy Bureau, MAFF

**Evaluation Analysis:**

Shinsuke KUBO, NEWJEC Inc.

**Planning Evaluation:**

Junko KATSUNISHI, Division of Livestock and Horticulture, Department of Agricultural Development Cooperation, JICA

## 4. Period of Evaluation

4 March 2001 – 17 March 2001

## 5. Results of Evaluation

### (1) Relevance

DILAVE's main role is to assure the safety of meat products for export through accurate inspection of infectious diseases. The country's top priority of increasing the export of animal products requires the prevention and control of animal infectious diseases with improvement of veterinary diagnostic techniques. The Project was in line with these needs.

### (2) Effectiveness

The Project has enabled DILAVE to diagnose animal infectious diseases accurately and rapidly. Its epidemiological survey showed clear existence and epidemic of diseases. The production of Tuberculin, used for the detection of TB in cattle, was increased from 137,850 doses in 1997 to 258,000 doses in 1999. A survey done in September 2000 by the USA and Mexico confirmed the reliability of DILAVE's inspection results and increased trust from export counterparts.

### (3) Efficiency

Dispatch of experts, counterpart training and provision of equipment were executed effectively, and the project was managed smoothly. Those inputs met the needs of Uruguay for relatively high techniques.

Budget allocated to DILAVE from the Uruguay government was not sufficient enough to replenish consumables.

### (4) Impact

The Project enhanced capabilities of DILAVE to deal with various diseases beyond the project scope. The importance of animal disease diagnostic study became more recognized by executive officers of the Ministry of Livestock, Agriculture and Fisheries (MGAP), clinical veterinarians and farmers. Impacts reached neighboring coun-



Pathologic diagnosis by the counterparts

tries. Chile with no veterinary lab requested DILAVE for inspection.

### (5) Sustainability

The MGAP upgraded DILAVE from an "inspection center for livestock export" to a "reference lab," and is planning to strengthen the organization and expand budget allocation. DILAVE also has several income sources such as fees from diagnostic services. The technical level was improved and maintained high enough to sufficiently conduct diagnostic and research work. Aging of DILAVE staff is a concern due to the non-hiring policy of new civil servants, but staff development fellowship of the MGAP is one of the solutions. Overall, few hindering factors are expected.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

Most objectives will be achieved as scheduled, owing to well-examined and effective inputs, the high acceptance level of Uruguay with a quality organizational system and techniques, and the strong commitment of the Government to the Project that yielded self-help.

### (2) Recommendations

Since a few problems exist in DILAVE's system for providing lab animals, an "Animal Committee (tentative name)" must be established to promote appropriate operation of lab animal facilities. Staff training is also necessary.

Further sustainability and development of DILAVE will require a multidisciplinary approach in its research activities, human resources development plan, and internal exchange to fulfill the technological disparity between central and regional labs.



# Reconstruction of Radio East New Britain



Project Sites Kokopo

## 1. Background of Project

In Papua New Guinea, radio broadcasting plays an important role as an effective medium for transmitting information throughout the nation. It provides news reports, educational and entertainment programs, and is also used for extending knowledge on health, sanitation and agriculture cultivation, and for emergency information transmission. Radio East New Britain (RENB) used to be the main broadcast station for the northern area until the studio facilities were completely destroyed by the eruption of a volcano on the outskirts of Rabaul in September 1994. The RENB established a temporary office in Kokopo to resume broadcasting, but since the facilities and equipment were not sufficient, they could not produce programs to provide sufficient information for the inhabitants. Under a situation in which volcanic eruptions continued, restoration of the broadcasting service was a pressing need in order to secure the transmission of emergency information.

Based on such background, the Government of Papua New Guinea compiled a reconstruction plan for RENB, and requested Japan Grant Aid for the construction of the new broadcasting station.

## 2. Project Overview

### (1) Period of Cooperation

FY1996 – FY1998

### (2) Type of Cooperation

Grant Aid

### (3) Partner Country's Implementing Organization

Radio East New Britain (RENB),  
National Broadcasting Corporation (NBC),  
Ministry of Communication

## (4) Narrative Summary

### 1) Overall Goal

Necessary information and knowledge is transmitted to the inhabitants in East New Britain Province.

### 2) Project Purpose

Quality radio programs are provided to the people of East New Britain Province

### 3) Outputs

- a) Facilities and equipment for the broadcasting are developed.
- b) The technology and the system are developed to edit, produce, and broadcast programs.

### 4) Inputs

#### Japanese Side

Grant	795 million yen (E/N amount)
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#### Papua New Guinean Side

Land Facilities	95 million yen
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## 3. Members of Evaluation Team

JICA Papua New Guinea Office  
(Commissioned to a local consulting firm, Theodore Varpiam)

## 4. Period of Evaluation

19 February 2001 – 2 March 2001

## 5. Results of Evaluation

### (1) Relevance

In East New Britain Province, where the diffusion rate of television is low, the radio broadcast by RENB is

indispensable to life. This project was requested by the Government of Papua New Guinea in responding to the needs of the inhabitants who lost such services.

Since the State of East New Britain places emphasis on radio broadcasting in its development policy, this project can be evaluated as being relevant in terms of meeting the needs of the inhabitants and the district and central government of Papua New Guinea.

## (2) Effectiveness

The facilities, materials, and services of the RENB were improved and restored completely. The broadcasting time was restored up to 17 hours per day, from the 5-7 hours per day in the aftermath of the volcano explosion.

Although radiowave interference was occasionally observed in several places in the State, radio services were provided for most of the inhabitants. The project objectives are considered achieved.

## (3) Efficiency

All the materials of this project were procured as planned, and the budget was appropriate. The equipment provided was compatible with the management ability of the RENB staff. A staff member pointed out that the training carried out by the Japanese on how to use the equipment was insufficient due to the instructor's language skills. However, the operating conditions of the equipment are reported to be good, so the efficiency of this project is highly evaluated.

## (4) Impact

Because the broadcasting of RENB was restored, the people suffered from the volcanic eruption are able to learn ways to improve their lives. The broadcasting also contributes in the education of East New Britain Province by introducing agriculture techniques, land use methods, and remote education by universities.

Furthermore, most of the Government organizations, NGOs, churches, local enterprises, community groups and inhabitants are among the listeners of RENB, thus its impact on East New Britain Province is considered to be large.

On the other hand, some people are concerned about the commercialization of life by the advertisements, and the negative influence given to the youth by pernicious information.

## (5) Sustainability

RENB is positioned as the local branch of the NBC network, and continuing the business is not a problem.



The REVB main studio

However, RENB has difficulties in maintaining the present service level because of the personnel restructuring plan of its regulatory authority, NBC. In this restructuring plan, only an eleven personnel arrangement is officially agreed for the radio stations of each state, and salary are not to be paid for the excess staff. Therefore, RENB will have no option but to dismiss some of its 26 present staff members if employment is not maintained by budget distributed by the state government and income from broadcasting. RENB is required to enhance its management ability so that the station is managed with a limited number of staff members.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

When supplying comparatively advanced equipment, it is necessary that maintenance training is carried out by a person with sufficient language skills.

### (2) Recommendations

It is necessary for RENB to acquire enough budget to maintain and expand its services in the future. Measures to be taken are, the transfer of the supervision authority from the NBC to the state government, the increase in revenues from commerce and enterprise, and the acquisition of financial assistance from overseas can be considered.

Furthermore, it is important to deal with the needs of listeners such as solving radiowave interruption, strengthening of popular programs, establishing a program judging committee, and providing staff training and upgrading of facilities.

# Energy Efficiency Center Project



Project Sites Sofia

## 1. Background of Project

Recently, energy import has imposed a heavy burden on the Bulgarian economy. The accumulation of energy-saving technology and information has been poor in Bulgaria, as rich energy from the former Russian bloc was supplied cheaply before the collapse of the COMECON system. Inefficient use of energy was obstructing industry activation.

Based on such conditions, the Government of Bulgaria planned to establish the Energy Efficiency Center (EEC) to promote efficient use of energy by policy proposals to the government and technological guidance to industry. The Bulgarian government requested a Project-Type Technical Cooperation from the Japanese Government since Japan has been at the top level in the world in these techniques.

## 2. Project Overview

### (1) Period of Cooperation

1 November 1995 – 31 October 2000

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Ministry of Industry (up to December 1999)

Ministry of Economy (after December 1999)

### (4) Narrative Summary

#### 1) Overall Goal

Energy consumption within industries in Bulgaria is improved.

#### 2) Project Purpose

The function of the EEC is intensified so that it can effectively recommend national policies, and give guidance to industry regarding energy conservation by itself.

#### 3) Outputs

- EEC's administration and management structure are established.
- The staffs of EEC are able to operate and maintain equipments, and to carry out proper factory audits and consultations independently on energy consumption improvement.

- Practical utilization of information system is established.
- Public information system is established.
- EEC's ability to recommend national policies is to be developed.

### 4) Inputs

#### Japanese Side

Long-term experts	5
Short-term experts	33
Trainees received	8
Equipment	110 million yen
Local cost	22 million yen

#### Bulgarian Side

Counterparts	6
Facilities and equipment	
Local cost	5 million yen

## 3. Members of Evaluation Team

### Team Leader:

Kazuo TANIGAWA, Special Technical Advisor, JICA

### Technical Cooperation Planning:

Kenichiro KOREEDA, International Affairs Office, Coal and New Energy Department, Agency of Natural Resources and Energy Cooperation Planning, Ministry of International Trade and Industry

### Technology Transfer Planning:

Mitsutoshi SUZUKI, Toyo Engineering Corporation

### Energy Conservation Technology:

Takeshi SEKIYAMA, The Energy Conservation Center Japan (ECCJ)

### Evaluation Management:

Hisae OSHIKANE, Second Technical Cooperation Division, Mining and Individual Development Department, JICA

### Data Compilation and Analysis:

Tomoyuki YAMASHITA, Tokyo Electric Power Services Co., Ltd.

## 4. Period of Evaluation

18 June 2000 – 6 July 2000

## 5. Results of Evaluation

### (1) Relevance

In Bulgaria, there has been an increasing interest in energy saving, to strengthen international competitiveness of domestic industries and to preserve its environment. Hence, energy saving has been positioned as one of the important policies. It is, therefore, highly relevant to foster an organization that can give the guidance to promote energy saving to industry.

### (2) Effectiveness

As a result of the project, the Center for Energy Saving grew to be an organization that can give guidance to industries. The number of diagnosed companies increased steadily, and energy reduction proposals were submitted to 95 companies. Besides, the Center has made contracts with five companies as model factories including the two that were the most energy consuming companies. In one of the companies, the energy reduction effect worth of 88 million yen was achieved in the first year.

However, in the middle of the project, the mechanism was changed, and the income from the Center's service, once paid directly to the Center, came to be collected by the Ministry of Economy. This made the cash flow on factory diagnosis unclear, and thus, the establishment of the management system was not fully achieved.

Regarding the establishment of the Center's ability to propose policy measures for energy saving, the external conditions changed during the project period. The State Agency on Energy and Energy Resources was newly established as the national policy development and execution organization, and considering the new mandate of the Center, it became difficult to achieve the project objective to propose policy options at the national level. However, when the energy saving law was enacted in 1999, the purpose could be partly attained through reflecting the Center's opinion to the law.

### (3) Efficiency

The equipment provided was used frequently and effectively. Furthermore, the training in Japan, which put emphasis on the practice, gave results, and staff with satisfactory technical level were fostered. This led to the smooth technology transfer of the factory diagnosis. One staff member left the Center, this was due to unsatisfactory treatment and the lack of transparency of the organization.

### (4) Impact

In July 1999, "laws on energy and energy saving" were implemented, and energy saving diagnosis became mandatory for factories beyond a certain scale. This is partly because the Center of Energy Saving reflected its opinion in the bill, by exchanging opinion and information with the State Agency on Energy and Energy Resources.

Meanwhile, based on the diagnosis of the Center, foreign-affiliated private enterprises started programs to invest in factories that try to save energy. If this takes root, without the factories raising a large sum of capital investment by themselves, it enables to promote energy saving. Therefore, it may have the potential to have a major impact on Bulgarian industry.



A long-term expert giving lecture to the counterparts

### (5) Sustainability

The Center has acquired enough technology to continue and develop the activities initiated by the project, and its services has been highly valued, as seen in the actual performance. By energy saving law, energy saving diagnosis has become mandatory. Thus, the needs of the private sector for the Center's service, such as measurement, the diagnosis, and the analysis technology, continue to be high.

Financially, the assistance from the government is assured. Furthermore, the prospects for the source of income there are, such as the factory diagnosis fees, and contract fees from the model factories. If it attempts to work towards sound management and to prevent of staff turnovers, project activities can be expected to continue.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

The relations among the related organizations and companies were extremely effective. For instance, Japanese private companies introduced factories applicable for diagnosis to the project. For future projects of similar nature, active approaches should be made to various public and private institutions and organizations.

### (2) Recommendations

It is necessary to reinforce the Center's management in terms of finance by making the income and costs clear, and to promote sound management and preventing turnover of staff. Regarding sources of income such as factory diagnosis and consultations, the proper settlement of prices would be necessary for covering the operation cost and giving staff incentives.

Furthermore, in order that an enterprise may continue energy saving efforts, the Center should strengthen its alliance with the State Agency on Energy and Energy Resources. Furthermore, it is necessary to support preferential treatment for the companies that are making such efforts.

<sup>1)</sup> By the reorganization of the ministries and agencies of the Government of Bulgaria, the Ministry of Industry was integrated with the Ministry of Trade and Tourism and became the Ministry of Economy.

# Polish-Japanese Institute of Computer Techniques Project



Project Sites **Warsaw**

## 1. Background of Project

Since 1989, Poland has been experiencing a transition to a market economy. Accordingly, in view of enhancing efficiency and productivity in various sectors, they have started applying computer technology such as automatic production systems and information processing systems.

To cope with the rapid computerization, development in human resources of computer engineers is essential. However, existing universities, where theoretical and mathematical approaches have been emphasized in the field of information science, were not able to provide practical education for computer engineers who would satisfy the social demand.

The Government of Poland requested a project-type technical cooperation to Japan, a country with rich experience in the field of information technology, to establish the Polish-Japanese Institute of Computer Techniques (PJICT) and to train practical-minded computer engineers.

## 2. Project Overview

### (1) Period of Cooperation

8 March 1996 – 7 March 2001

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Polish-Japanese Institute of Computer Techniques (PJICT), Ministry of National Education

### (4) Narrative Summary

#### 1) Overall Goal

Computerization in Poland is advanced.

#### 2) Project Purpose

Computer engineers that meet the demands in Poland are educated at the PJICT.

#### 3) Outputs

- Education program for the basic course and three specialized courses are developed.
- Teaching/learning materials are developed.
- Facilities and equipment are set up in seven laboratories.
- High level teaching staff is developed, based on research at the Institute.

e) Demands in Poland for computer engineers are surveyed.

f) Management of the PJICT is strengthened.

## 4) Inputs

### Japanese Side

Long-term experts	12
Short-term experts	44
Trainees received	17
Equipment	515 million yen
Local cost	36 million yen

### Polish Side

Counterparts	55
Land and facilities	
Local cost	710 million yen

## 3. Members of Evaluation Team

### Team Leader/Management of the Institute

Kenji OSHIMA, Professor, Faculty of Engineering, Saitama University

### System and Network Software:

Ryoichi URAO, Professor, Faculty of Engineering, Ibaragi University

### Information, System Engineering/Application of Artificial Intelligence:

Hitoshi MAEKAWA, Professor, Faculty of Engineering, Saitama University

### Cooperation Planning:

Kazuro SHIBUYA, Second Social Development Cooperation Division, Social Development Cooperation Department, JICA

### Evaluation Analysis:

Makiko KOMASAWA, Sekkei Keikaku Ltd.

## 4. Period of Evaluation

3 December 2000 – 15 December 2000

## 5. Results of Evaluation

### (1) Relevance

This project is relevant to Poland's national policy, which aims at the establishment of an IT nation. The PJICT is considered as the organization that will play a key

role in reaching the nation's objective. This project is also consistent with the Japanese ODA policy toward Poland, which aims to further support the transition to market economy. Moreover, it is relevant since Japan has competency in cooperation in the field of information technology.

## (2) Effectiveness

The number of PJICT students increased steadily from 572 in FY1996/1997 to 1,337 (incl. master's degree students) in FY2000/2001. Approximately 80% of the graduates and students seeking jobs has got places in IT-related jobs. The number of undergraduates proceeding to a master's degree was 26% of the total in FY1998/1999, increasing to 35% in FY1999/2000. It can be said that the graduates are receiving sufficient education of an undergraduate level.

Both students and graduates are satisfied with the practical curriculum the PJICT is providing. Around 80% of the graduates have appreciated the teaching methods of the instructors, equipment in the laboratory and the specialty of the course.

Thus, the PJICT has come to regularly supply computer-related engineers who meet the needs of society; and therefore this project has successfully achieved its purpose.

## (3) Efficiency

Inputs from both Japanese and Polish sides were appropriate in terms of quality and quantity, contributing greatly to the achievement of project outputs.

As for procurement of equipment, there was a case where the technology transfer was slightly affected. This was due to the delay of the delivery of the supercomputer, which was not delivered within the dispatch period of the expert in charge. However, this was solved by sending a short-term expert after its installation.

In the early stages of this project, both parties had difficulty in sharing technology transfer, because Polish counterparts had served concurrently in other universities. With the efforts of the PJICT, fulltime teaching staff is gradually increasing in numbers.

## (4) Impact

PJICT graduates has been contributing to the progress of computerization with their remarkable efforts in IT-related business. The result of a self-evaluation questionnaire for graduates asking whether they are "contributing to the progress of IT" in their offices indicated that 54% believe that they are. Result from interviews with graduates and their employers also implied that they are contributing to the progress of IT in their companies, and the growth of the IT industry in general.

Although a master's degree program was not included in this project, it was newly established by efforts of the Polish side in 1998 to further develop human resources in the IT field.

## (5) Sustainability

Although private universities such as the PJICT are not subject to direct financial support from the government, the Ministry of National Education has promised to support the PJICT by giving research consignments and support through scholarship fund systems. Since full-time



Robotics laboratory

teaching staff has been increasing in number, the technology transferred by the project will be sustained in the PJICT.

Thus, from technical and institutional aspects, it is expected that the PJICT can sustain itself as well. From the increase in the number of students and acquisition of a research grant, the financial basis is being established well. However, since computers need to be upgraded on a constant basis to cope with rapid progress in the IT area, it can not be too optimistic in terms of finance.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

In the IT field where technology progresses rapidly, the overall plan of the project should be carefully reviewed periodically in close collaboration with the project supporting committee in Japan, and it should be modified flexibly when needed.

### (2) Recommendations

It is important to balance practical and new academic education in the future. Since the number of students has increased, the PJICT should sustain the level of students' learning environment, such as securing enough space for classrooms and laboratories, and the adequate ratio of teachers and students. Equipment maintenance and the renewal plan should have a long-term perspective, and efforts should be made to realize the plan. The PJICT should also build an administrative structure with a long-term vision, personnel and financial management system.

## 7. Follow-up Situation

In order to strengthen the sustainability of the PJICT, follow-up experts working on the "Establishment of a Doctoral Course" and "Cooperation with Private Enterprise," areas indicated as part of its future vision, are being dispatched.

A third-country training program begun in 1999 called "East Europe Information Engineering" is being carried out with a five-year schedule. The training aims at development of human resources who will play an important role in the computerization of Eastern European countries.

# The Irrigation System Readjustment Project



Project Sites Bucharest, Giurgiu

## 1. Background of Project

The average annual rainfall in Romania ranges between 550-600 mm, and the shortage of water is especially serious from June to August, with sometimes no rain at all. The Romanian Government has recognized the necessity of irrigation since the previous regime.

However, existing irrigation and drainage systems had not been renewed due to the economic downturn since the democratic revolution, and the progress of decrepitude had deteriorated irrigation efficiency<sup>1)</sup>. According to the Land Law issued in 1991, a land privatization program has made steady progress, however, it will take more time for private farmers to manage their own farms, and to organize cooperatives. There has been an inefficient condition with little irrigation water used, and small-scale irrigation facilities scattered.

Under these circumstances, the Romanian Government requested to Japan a project-type technical cooperation in April 1994, to render technical advice, guidance and training in order to readjust its irrigation systems.

## 2. Project Overview

### (1) Period of Cooperation

1 March 1996 – 28 February 2001

### (2) Type of Cooperation

Project-type Technical Cooperation

### (3) Partner Country's Implementing Organization

Ministry of Agriculture and Food,  
National Company "Land Reclamation" (SNIF),  
Academy of Agricultural and Forestry Sciences,  
Research Institute of Irrigation and Drainage (ICITID)

### (4) Narrative Summary

#### 1) Overall Goal

The operating ratio of irrigation facilities is increased by the rehabilitation and modernization of irrigation facilities, and agricultural production and the net income of farmers are increased by the improvement of maintenance efficiency and irriga-

tion methods in the field.

### 2) Project Purpose

Irrigation efficiency is improved through research, implementation, management and training.

### 3) Outputs

- The irrigation efficiency of water conveyance facilities is improved.
- The irrigation efficiency of terminal water conveyance and control facilities is improved.
- The irrigation efficiency of field water application is improved.
- Improved methods of irrigation efficiency through training are extended.
- The information systems for the effective execution of irrigation programs are improved.

### 4) Inputs

#### Japanese Side

Long-term experts	9
Short-term experts	12
Trainees received	7
Equipment	200 million yen
Local cost	27 million yen

#### Romanian Side

Counterparts	22
Land, facilities and fields	
Local cost	5.82 billion leis (Approx. 26 million yen)

## 3. Members of Evaluation Team

### Team Leader:

Hiroshi OSARI, Associate Director of Research, National Research Institute for Agricultural Engineering, Ministry of Agriculture, Forestry, and Fisheries (MAFF)

### Irrigation System:

Kouhei KATOU, Assistant Director for Irrigation, Drainage and Reclamation Engineering, Tohoku Regional Agricultural Administration Office, MAFF

### Agricultural Development Strategy:

Masashi NAKAI, Senior Technical Officer, Technical Cooperation Division, International Department, Eco-

conomic Affairs Bureau, MAFF

#### Evaluation Analysis:

Mitsuo NISHIYA, (Nippon Giken Co.)

#### Evaluation Plan:

Yasuto TAKEUCHI, Deputy Director, Agricultural Technical Cooperation Division, Agricultural Development Cooperation Department, JICA

## 4. Period of Evaluation

29 October 2000 – 10 November 2000

## 5. Results of Evaluation

### (1) Relevance

The relevance of this project is recognized from the fact that the purpose of this project and project activities meet the "Ten Year Development Program" that was announced in 1995 by the Romanian Government, and have not changed since the project started.

### (2) Effectiveness

The Japanese experts developed manuals, video materials, and training plans on drainage and maintenance of irrigation facilities, with which counterparts actively provided training courses. Researches have been developing as well. For example, it was analyzed characteristics of soil and crop moisture, and finally found the most applicable irrigation efficiency for each farm field. Irrigation technologies were also improved through the research on crop yields. Overall, this project is judged to have satisfied the goals.

### (3) Efficiency

The delayed assignment of the Romanian counterparts, together with extraordinary rainfall in 1997 and financial difficulty in 1999, hindered efficient progress in the improvement activities of irrigation facilities. However, project staff took appropriate measures against the various situations, and input resources were managed efficiently.

### (4) Impact

This project was the first Japanese technical cooperation implemented in Romania. The Japanese experts and counterparts had productive discussions to jointly solve the problems of irrigation. The Romanian counterparts, which was accustomed to bureaucratic administrative methods in the previous regime, learnt efficient institutional management through the project. The technical skills transferred were widely introduced to various areas, leading to the adoption of modern research methods and technologies by other institutions.

### (5) Sustainability

Although there was not enough budget for Romania in transition, grant aid from the EU <sup>2)</sup> and loan from the World Bank was already started for the Ministry of Agriculture and Food. The financial situation should be better,



An expert and counterparts installing a moisture measuring equipment for the soil

as these aids are targeting water resource management (irrigation, usage of water resources and drainage) and farmer organizations. The ministry is also tackling institutional modernization under reform, and stable progress can be expected.

The irrigation technologies, improved though the project, have been transferred to the counterparts and the engineers. A manual for the improvement of irrigation technologies was developed by ICITID, and Romanians themselves will hopefully make further progress.

## 6. Lessons Learned and Recommendations

### (1) Lessons Learned

A joint coordination committee should be regularly held for the smooth implementation of a project, especially when the implementing body is not a single organization.

### (2) Recommendations

In order to make good use of the transferred techniques of a project, associated farms and water users associations should be set up, aiming at supporting the smallest irrigation groups.

For monitoring and large-scale implementation of the project results, it is necessary to set up a division for development and transfer of technology within SNIF.

As the project purpose has been satisfied, there is no need for follow-up.

<sup>1)</sup> How efficiently water is used to reach the root area in soil from the water resource.

<sup>2)</sup> 15 billion yen is disbursed annually during 2000—2006 by the Special Association Programme for Agriculture and Rural Development (SAPARD).



# Glossary

- **Accountability**

Responsibility to furnish adequate and accurate explanations to citizens and the people of a recipient country regarding content, financial affairs, and reasons behind decisions when proceeding with development aid and international cooperation activities and programs.

- **Activities**

Activities, an element of PDM, are carried out to achieve the output of a project. Each activity flow is described for every output in PDM.

- **Aftercare Cooperation**

Additional cooperation, including provision of equipment and dispatch of experts after completion of a project. In addition, as a part of aftercare cooperation, in the Acceptance of Technical Training Participants Program and Youth Invitation Program, support is given to the establishment and management of alumni associations for such groups, and reference materials are sent to former training participants after their return to their home countries.

- **Baseline Survey**

Baseline surveys investigate and analyze the characteristics of a target area prior to implementation of a project. These surveys are necessary when project objectives are measured by indicators.

- **Basic Design Study (B/D)**

Japan's Grant Aid Programs are initiated in line with decisions (generally based on JICA's own B/D) made by the Japanese government on matters such as suitability and content. These studies aim to explore a project's potential and to create optimum plans for its realization. The main topics include basic design, construction costs,

work processes, alternative plans, economic and technical feasibility, financial concerns, and administrative systems.

- **Basic Study/ Project Formulation Study**

When cooperation is provided, there may be a lack of clarity concerning relations with other aid organizations, particularly in connection with the recipient country's development plans and fields of cooperation, the effects of cooperation, influence on the environment and society and sustainability. JICA carries out project formulation studies to clarify such matters and compensate for any inadequacies. Study teams are sent to discuss matters with the recipient government and related organizations, and support may be provided for drafting requests.

- **Beneficiaries**

Individuals, groups or organizations that receive the benefits of a project.

- **Capacity Building**

A concept referring to the establishing and raising of the recipient's ability to execute and administer the process of institutional building, i. e., the process whereby the agent of implementation achieves self-reliance.

- **Common Agenda**

The Common Agenda for Cooperation in Global Perspective (the Common Agenda) was launched by Japan and the United States in July 1993. The Common Agenda rests on five "pillars": promoting health and human development; responding to challenges to global stability; protecting the global environment; advancing science and technology; and expanding interactions for mutual understanding.

- **Community Empowerment Program**

A program started in FY 1977 on the basis of the "Global Welfare Initiatives" proposed by Japan at the Lyon Summit in 1996. Support related to maternal and child health; welfare of the elderly, the disabled and children; and poverty alleviation measures are commissioned by JICA for non-governmental organizations active in the regions concerned (local NGOs).

- **Counterparts**

Local technical experts who work together with JICA experts and Japan Overseas Senior Volunteers (JOCV) sent to developing countries to provide technical assistance and who receive technical instruction from these JICA experts or JOCV.

- **Country-focused Training Course**

These training courses limit participation to a certain country or region. The training subjects are focused on development issues that are unique to the country or region involved, and 5-10 trainees are accepted.

- **Country-program Evaluation**

Assessing the JICA cooperation projects of a country on a cross-sector basis. The overall impact of JICA cooperation and implementation problems in a country are analyzed and lessons and recommendations for future cooperation to the country are offered. The results of evaluation are reflected in improvements in future country programs and cooperation methods for the country.

- **Development Assistance Committee (DAC)**

The Development Assistance Committee (DAC) was formed in 1961 as a subordinate agency of the Organisation for Economic Cooperation and Development (OECD). DAC distributes aid information, adjusts aid policies, and examines the implementation of aid by member countries and their aid policies. Where necessary, it also gives advice to member countries. As of 2001, DAC consisted of 22 developed countries as well as the European Union (EU).

- **Development Study**

Development studies support the formulation of plans for public projects by dispatching a study team to contribute to social and economic advancement in developing countries in such sectors as electric power, ports, roads, transportation, communication, irrigation and water resource development. Reports, which are prepared based on the study results, provide recipient governments with data for assessing social and economic development policies. They also offer international organizations and donor countries resources for studying the need for financial aid and technical cooperation.

- **Dispatch of Experts**

Experts dispatched to developing countries and international organizations carry out the formulation of development plans, research studies, instruction, extension activities, consulting and other work at a variety of locations, including government-related organizations, testing and research institutes, and academic and training institutions. In selecting experts, JICA either asks for recommendations from appropriate personnel of related ministries and agencies, or chooses from among experts who are already registered. There are two types of experts, depending on the method of dispatch: individual experts and project experts. The former is individually dispatched, while the latter is dispatched under project-type technical cooperation. Experts are also classified by length of dispatch term into long-term (one year or longer) and short-term (less than one year).

- **Effectiveness**

Effectiveness is one of the five evaluation criteria. It measures the relationship between the extent to which the project purpose is achieved and the output.

- **Efficiency**

Efficiency is one of the five evaluation criteria. It identifies the productivity of input and output. It also measures how costly it is to conduct the input in order to achieve the output.

- **Exchange of Notes (E/N)**

An agreement concluded among two or more states or international organizations. In the case of grant aid, funds are provided based on the E/N.

- **Expert Team Dispatch Program**

A form of cooperation placed in an intermediary position between Project-Type Technical Cooperation and the dispatch of individual experts started in 1989. The dispatch of an experts' team is considered the core of the program, and the acceptance of trainees and supply of equipment are combined as needed. In principle, the cooperation period is three years, shorter than the five years for project-type technical cooperation. It is designed to offer instruction and advice to counterparts on specific technology topics, while working within the existing local organization.

- **Ex-post Evaluation**

Ex-post evaluation is an evaluation executed at a certain period of time after completion of a project. It is undertaken for the purpose of deriving lessons and recommendations that contribute to making effective and efficient JICA projects in the future, by focusing its examination most notably on impact, relevance, and sustainability among the five evaluation criteria.

- **Evaluation Grid**

An evaluation grid is a table that documents the survey method and the source of information, which enables understanding of the framework of an evaluation study.

- **Feasibility Study (F/S)**

Feasibility studies investigate the economic and financial possibility of implementation, relevance and investment effects on projects. Generally, it attempts to objectively demonstrate whether the implementation of a project is socially, technically, economically and financially feasible. It is one of the types of the development study projects.

- **Feedback**

The transmission of findings generated through the evaluation process to parties for whom it is relevant and useful so as to facilitate learning.

- **Five Evaluation Criteria**

The evaluation criteria advocated in "Principles for Evaluation of Development Assistance" by the Development Assistance Committee (DAC) in 1991. The five criteria are relevance, effectiveness, efficiency, impact and sustainability.

- **Focus Group Discussion**

A small group of people with common characteristics or interests is invited to discuss specific topics in detail. This survey method can be used to clarify the group's understanding of and interests in specific topics.

- **General Information (GI)**

GI refers to a documentation that includes information such as training course purpose, period, curriculum, training organizations, prerequisites, and conditions during the stay for training. JICA distributes them to the governments of partner countries upon implementing a group training course.

- **Gender**

Differentiation based on social constructs rather than biology.

- **Global Issues**

Issues of global significance such as the environment, population, HIV/AIDS, women in development (WID) and narcotics. Also, includes issues requiring international cooperation for their foundation.

- **Grant Assistance for Grassroots Projects**

A form of grant aid executed through Japanese overseas diplomatic offices to support small-scale projects that cannot be dealt with adequately by means of ordinary grant aid. Implemented in response to requests by local governments and NGOs in developing countries.

- **Impact**

Impact is one of the five evaluation criteria, and is the positive and negative effects produced by a development project, intended or unintended. Of the impacts, the overall goal in the project design matrix (PDM) is the positive intended output.

- **Important Assumptions**

Important assumptions, elements of PDM, are factors or risks that cannot be controlled by a project but may have impact on the progress of the project or the achievement of the goal.

- **In-Country Training**

A type of training implemented within a developing country in order to extend the knowledge and skills within the country. In most cases, the personnel who received a technical transfer play the central role in its implementation.

- **Indicator**

Indicator is a quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement of a project.

- **Input**

Input refers to the financial, human, and material resources used to implement a project.

- **Japan Bank for International Cooperation (JBIC)**

A special governmental corporation founded through the merger of the Overseas Economic Cooperation Fund (OECF) and the Export-Import Bank of Japan in October 1999 in order to support the implementation of ODA through yen loans and the trade and investment of Japanese companies.

- **Japan Overseas Cooperation Volunteers (JOCV)**

Japan Overseas Cooperation Volunteers program, established in 1965, promotes and fosters volunteer activities by the youth of Japan who wish to work with

local residents in developing countries and contribute to the economic and social development of the region to which they are dispatched.

- **Japanese Cooperation to Support the Formulation of Key Government Policies**

A cooperation for countries that are facing the transition to a market economy, which it aims to provide at policy level to the main organizations of a nation responsible for policy-making of important sectors such as finance, industry and regional development. Japan has been operating the Program to Support the Formulation of Key Government Policies since 1995, and some of them were already implemented in Poland, Uzbekistan, and Vietnam. JICA has widened the coverage of those studies to policy support for transition economies with the purpose of providing more effective intellectual cooperation for the introduction of a market economy.

- **JICA Partnership Program**

In the context of diversification of needs among developing countries, the JICA partnership program is concerned with providing cooperation in areas of social development involving a small-scale but detailed response and of intellectual support. This ODA program is implemented with Japanese NGOs, local government authorities, universities, and private companies processing practical experiences in these areas as partners.

- **Joint Evaluation**

An evaluation carried out together with relevant organizations in the partner country or with other donors.

- **Lessons Learned**

Generalized lessons drawn from evaluation results. They are applicable to other projects, development plans, and aid strategies.

- **Local Cost**

Of the funds necessary for the implementation of projects, local cost refers to the cost procured in partner countries in local currency, such as budget for local re-

muneration for construction and procurement of equipment. When a project is jointly implemented, it refers to costs that should be borne by the partner country (costs for land acquisition, facility construction, facility maintenance, and project management).

- **Logical Framework**

Logical framework identifies the project's main elements (input, output, purpose and goal) and their logical relationships, indicators and the assumptions or risks that may influence success and failure. It thus facilitates planning, execution, and evaluation. Similar framework is also applied to PDM.

- **Master Plan Study (M/P)**

M/P is a study carried out to formulate long-term sectoral development plans. It is implemented at national and regional levels, across different sectors, or levels of individual projects. Master plans ensure efficient execution of multiple projects by making them mutually compatible and by clarifying their priority. The formulation of economic development plans is also encompassed in its area of study.

- **Means of Verification**

Means of verification is an element of PDM that refers to information sources and survey methods used to measure the achievement of a project.

- **Mid-Term Evaluation**

Refers to an evaluation conducted at the mid-term of a project, examining points such as the efficiency and relevance of the project. It provides information for deciding whether or not the initial planning needs to be revised.

- **Monitoring**

A continuing function that uses a systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing development project with indications of the extent of progress in the use of all allocated funds.

- **Narrative Summary**

Narrative summary is a column of PDM that shows the logical links of activities, output, project purpose and overall goal.

- **Okinawa Infectious Diseases Initiative**

In the Okinawa International Conference on Infectious Diseases with representatives from the G8 in July 2000, the issue of infectious diseases was recognized as one of the principal causes that deteriorate life expectancy and hinder development, and lead to poverty in developing countries. Japan, the chairman of the conference, declared that Japan would actively invest in infectious disease control, targeting mainly HIV/AIDS, tuberculosis (TB), malaria, parasite diseases, and polio. The basic principle in promoting above activities identified as (1) ownership of developing countries; (2) training; (3) partnership among communities, donors, and international organizations; (4) south-south cooperation; (5) promotion of research activities; and (6) public health at the local level. Japan committed three billion dollars over five years to this initiative, and established a fund for NGOs in the United Nations.

- **Output**

Output is refers to the services and results produced by the implementing of a project.

- **Overall Goal**

The overall goal refers to the indirect and long-term impact defined at the project-planning stage.

- **Participatory Evaluation**

An evaluation in which representatives of donors, implementing agencies, and stakeholders (including beneficiaries) work together to evaluate all stages of a project; plan studies, and analyze study results.

- **Phasing**

After the completion of cooperation period, a project implemented as a project-type technical cooperation is generally handed over to the government of the recipient

country to be operated and maintained by its self-help efforts. However, in order to increase the effectiveness of the cooperation, the period of cooperation may be extended, when for example, expanding or modifying the contents of cooperation or enlarging target areas is considered necessary. In this case, the project is phased in order to distinguish between the original cooperation period and the extended period. As in the case of a grant aid project, when a project is too large to implement in a fiscal year, it may be phased as I/III phase, II/III phase and III/III phase.

- **Preconditions**

Preconditions, an element of PDM, refer to the requirements that must be satisfied before implementing a project.

- **Primary Health Care (PHC)**

An approach to healthcare in which diagnosis, treatment and efforts to raise health standards are handled integrally on the local level. Available to all members of local communities, PHC aims to establish affordable and accessible systems of medical care.

PHC is composed of the following eight elements: (1) health education, (2) provision of food and improvement of nutrition (3) supply of safe water and hygiene management, (4) maternal and child health (including family planning), (5) preventative vaccines, (6) prevention and control of epidemic illness prevailing in regions, (7) appropriate treatment of general illnesses and injuries, and (8) supply of essential drugs.

- **Project Cycle Management (PCM)**

PCM is a methodology of appropriately managing the cycle of planning, implementation, evaluation, and its feedback of a project.

- **Project Design Matrix (PDM)**

PDM is the term used in the PCM method, describing the logical framework of a project to facilitate planning, monitoring, and evaluation. It is composed of elements such as indicators, methods to acquire data, exter-

nal factors, input, and preconditions.

- **Project Formulation Study**

See Basic Study.

- **Project Purpose**

The project purpose is the target expected to be achieved by the completion of a project.

- **Project-Type Technical Cooperation**

A type of technical cooperation under which three kinds of aid schemes (dispatch of Japanese experts, acceptance of trainees, and provision of equipment) are integrated and implemented as a program. It has been integrated into technical cooperation projects since fiscal 2002.

- **Provision of Equipment**

The provision of equipment needed generally for technical transfer. JICA provides necessary equipment as a part of technical cooperation toward the effective implementation of the various types of technical cooperation projects being carried out by Japan.

- **Recommendations**

Specific measures, suggestions and advice obtained from evaluation results aiming at enhancing the effectiveness, quality, or efficiency of the project concerned; at redesigning the objectives; and/or at the reallocation of resources. Recommendations should be linked to conclusions.

- **Record of Discussions (R/D)**

R/D refers to documents signed by Japan and a partner country when Japan starts a project-type technical cooperation. This document includes items regarding cooperation contents that have been agreed upon by both sides.

- **Relevance**

Relevance, one of the five evaluation criteria, refers to the extent to which the objectives of a development

intervention are consistent with beneficiaries' requirements, country needs, global priorities and partner's and donor's policies.

- **Reproductive Health**

The main concept proposed in the International Conference on Population and Development (1994), which refers to a state of health in which all the functions and active processes of human reproduction are free from illness or impediments and are maintained in a wholly satisfactory condition (physically, mentally, and socially).

- **Research Cooperation**

A type of technical cooperation under which researchers from Japan and a developing country engage in joint research on topics related to economic and social development in the developing country. Cooperation normally lasts three years. JICA sends a team of experts, accepts counterparts for training, when necessary, provides equipment and local working costs.

- **Scope of Work (S/W)**

Before implementing a development study, JICA examines the request from a partner country and decides the draft implementation plan and basic policy. Following this procedure, a preparatory survey team re-examines the background of the requested project and explores the possibility of implementation through investigating the relevant information. The S/W is a document that is agreed upon between JICA and the partner government, defining the scope of work, contents, and schedule of the study.

- **Senior Advisor**

An expert working for JICA who is devoted to technical cooperation activities. Overseas, they work as high-level advisors, project leaders, and general experts, while in Japan, they conduct various kinds of research, offer advice on research, train would-be experts and instruct technical training for participants overseas.

- **Senior Overseas Volunteers**

Senior Overseas Volunteers is a program that assists the activities of Japanese volunteers between the ages of 40 and 60 with appropriate techniques, knowledge, and experiences suited to request countries who are dispatched for the development of each country. The assignment period is usually one or two years.

- **South-South Cooperation**

Mutual economic development among developing countries through regional cooperation. Development in these countries was previously thought to depend upon financial and technical aid from more developed countries. However, as evident in the emergence since the 1970s of the Organization of Petroleum Exporting Countries (OPEC) and the newly industrializing economies (NIEs), the developing countries have diversified and the importance of cooperation among them has been recognized. In particular, the capital-intensive, knowledge-intensive technology of the more developed countries often fails to meet the needs of developing nations, whose main need is for intermediate labor-intensive technology. Under these circumstances, cooperation among developing nations through institutions such as the United Nations Conference on Trade and Development (UNCTAD) has been encouraged since the late 1970s.

- **Stakeholders**

Stakeholders refer to agencies, organizations, groups, and individuals that have direct and indirect interest in a project and its evaluation, such as donor agencies and implementing agencies in partner countries.

- **Sustainability**

Sustainability, one of the five evaluation criteria, is of the continuation of benefits of a project after the project assistance is completed.

- **Terminal Evaluation**

Terminal evaluation is undertaken jointly at the time of completion of cooperation, with relevant organization

in the partner country. Using the five criteria of evaluation, research and analysis are conducted in various areas, most notably efficiency, effectiveness, and sustainability of the project. Evaluation is undertaken for the purpose of determining whether it is possible for JICA to complete its cooperation or there is a need to provide a follow-up program.

#### • **Thematic Evaluation**

Focusing on the themes of specific sectors, major issues (such as environment, poverty and gender) and project schemes, the impact and challenges of JICA cooperation are analyzed. The results of evaluation are reflected in establishing related development policies and the formation of related projects.

#### • **Third-country Training**

A type of training implemented by JICA aimed at enabling a partner country that was subjected to technology transfer from Japan, to hand on the knowledge and techniques it has acquired to neighboring countries. The host country receives financial and technological support from Japan and trainees from neighboring countries with similar natural, social or cultural environments are invited individually or in groups to be trained in the appropriate technology in accordance with each country's local circumstances.

#### • **Women in Development (WID)**

The essence of WID is that women are not merely the beneficiaries but also the agents of development. Women play an extremely important role in economic and social activities. Awareness that women's participation in development is indispensable to effective development aid led to the concept of WID.

## A ~ Z

- **ADB** Asian Development Bank
- **B/D** See "Basic Design Study"
- **BHN** See "Basic Human Needs"
- **CIDA** Canadian International Development Agency
- **DAC** See "Development Assistance Committee"
- **D/D** Detailed Design
- **EBRD** European Bank for Reconstruction and Development
- **EIA** See "Environmental Impact Assessment"
- **E/N** See "Exchange of Notes"
- **F/S** See "Feasibility Study"
- **GI** See "General Information"
- **HDI** Human Development Indicator
- **IBRD** See "International Bank for Reconstruction and Development"
- **ICAO** See "International Civil Aviation Organization"
- **IDB** Inter-American Development Bank
- **IFC** International Finance Cooperation
- **ILO** International Labor Organization
- **IMF** International Monetary Fund
- **IMO** International Maritime Organization
- **ISO** International Organization for Standardization
- **JBIC** See "Japan Bank for International Cooperation"
- **JOCV** See "Japan Overseas Cooperation Volunteers"
- **L/A** See "Loan Agreement"
- **M/P** See "Master Plan Study"
- **OECD** See "Organization for Economic Cooperation and Development"
- **OECF** The Overseas Economic Cooperation Fund (OECF) and the Export-Import Bank of Japan were integrated into the Japan Bank for International Cooperation in October 1999.
- **OSCE** Organization for Security and Cooperation in Europe
- **PCM** See "Project Cycle Management"
- **PDM** See "Project Design Matrix"
- **PHC** See "Primary Health Care"
- **R/D** See "Record of Discussion"
- **S/W** See "Scope of Work"
- **UNDP** United Nations Development Program
- **UNFPA** United Nations Population Fund
- **UNHCR** United Nations High Commissioner for Refugees
- **UNOPS** United Nations Office for Project Services
- **USAID** U.S. Agency for International Development
- **WHO** World Health Organization



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