

Terminal Evaluation

Latin America and the Caribbean

I. Outline of the Project

- Country: United Mexican States
- Project title: Project for Agricultural Development in Desert Lands in Mexico
- Issue/Sector: Agriculture
- Cooperation scheme: JICA Partnership Program
- Division in charge: Regional Department III (Latin America and the Caribbean), Central America and the Caribbean Team
- Total cost: 130,750,000 yen
- Period of Cooperation (R/D): From 9th July, 2001 to 8th July, 2004
(Extension):
(F/U) :
(E/N) (Grant Aid)
- Partner Country's Implementing Organization: Northwest Biological Research Center
- Supporting Organization in Japan: Faculty of Agriculture, Tottori University
- Related Cooperation: Project for Agricultural Development in Desert Lands in Mexico

1 Background of the Project

The California Peninsular is one of the most arid areas in Mexico. In the project target area which is the surrounding of La Paz, the capital city of the state of South Baja California, the mean annual rainfall is below 250mm and there is very limited surface water resources available. Therefore, the area is heavily dependent on the groundwater. Nowadays, there is a strong concern about the diminishing groundwater resource due to over-withdrawal, and, therefore, one of the important issues is to improve the water-use efficiency in the agricultural sector whose water consumption accounts for more than 80% in the area. On the other hand, soil salinization and alkalinization stemming from inadequate practices of irrigation and fertilization cause serious threats to the agriculture in the region.

In this context, the state government of South Baja California requested the Northwest Biological Research Center (CIBNOR) to undertake research that would lead to solutions to those problems. To address this task, CIBNOR asked for assistance from the Tottori University that had established the academic exchange program with CIBNOR for years and had a strong research record in the field of agriculture in arid lands. In response to the request, the Faculty of Agriculture of Tottori University initiated a collaborative project named "Project for Agricultural Development in Desert Lands in Mexico" (hereinafter referred to as "the Project") to address the issues in July 2001, under the scheme of "Development Partnership Program" financed by Japan International Cooperation Agency (JICA) since 1999.

2 Project Overview

(1) Overall Goal

The living standard of small/medium-scale farmers in the surrounding areas of La Paz is improved

(2) Project Purpose

The business performance of small/medium-scale farmers in the surrounding areas of La Paz is improved

(3) Outputs

Output 1 An extension package for cultivation technology with reduced irrigation and fertilization is developed.

Output 2 Small/medium-scale farmers in the surrounding areas of La Paz understand and adopt the cultivation technology with reduced irrigation and fertilization.

(4) Inputs

Japanese side:

Long-term Experts	0	Equipment	approx. 23,891,000 Yen
Short-term Experts	13 (the total number of their visits is 64)		
Local cost	approx. 40,019,000 Yen		
Trainees received	11	Others	approx. 5,687,000 Yen
Total Cost 130,750,000 Yen			

Mexican Side:

Counterpart Personnel	17		
Land and Facilities	project office, facility and equipment of CIBNOR, experimental field		
Local Cost, Equipment and Others	CIBNOR covered the costs of, among others, utility fees of the project office, installation and maintenance of the facility and equipment, and customs clearance of equipment imported from Japan. The amount of those costs, however, is not available because they are not divisible from the entire operational costs of CIBNOR.		

II. Evaluation Team

Members of Evaluation Team

- Yasushi Wada, Director of Latin American Office, IC-Net Inc.
- Maya Asakura, Junior Consultant, IC-Net Inc.
- Takayuki Ando, Vice Resident Representative, JICA Mexico Office

Period of Evaluation

Day/ month/ Year~ Day/ month/ Year
31 May, 2004 ~ 18 June, 2004

Type of Evaluation:

Terminal

III. Results of Evaluation

1 Achievement

(1) Achievements with regard to Output 1

The activities originally planned under Output 1 were all implemented. The cultivation manuals (components of the extension package) for the recommended crops were developed except for pigeon peas. The finalization of those manuals was delayed, however, because time had elapsed before the Japanese experts and the Mexican counterparts understood each other and established the effective collaboration. As to the 5 recommended crops for which the cultivation manuals were developed, illustrated posters (simple cultivation manuals) were also prepared to explain the cultivation process of each crop in a way that was easy to understand. At the time of the evaluation, most of those cultivation manuals had just been finalized and they were yet to be applied. Therefore, it was considered that Output 1 was attained, (in other words, the extension package was developed) within the project period but the delay of the attainment left little time to apply the extension package for the achievement of Output 2.

(2) Achievements with regard to Output 2

Under Output 2, it was planned to (a) implement the training for extension agents, (b) establish the institution for the extension activities, (c) organize seminars for small/medium-scale farmers (including the model farmers) in the surrounding areas of La Paz, and (d) provide technical assistance to those farmers. None was undertaken at its full extent by the end of the project period. The level of the achievement of providing technical assistance to small/medium-scale farmers except model farmers in the surrounding areas of La Paz was particularly low, and they had not adopted the cultivation technology with reduced irrigation and fertilization that the Project had intended to proliferate in the area.

For the purpose of measuring the level of understanding of small/medium-scale farmers in the area about the cultivation technology with reduced irrigation and fertilization, a test of the understanding of the 9 farmers (including model farmers) about the technology was carried out. As a result, it turned out that the understanding of the farmers fulfilled the goal (i.e. the scores of the understanding test exceed 80% by the end of the Project) set in the project design matrix (PDM). Those farmers who were tested had been applying the cultivation technology with reduced irrigation. Nonetheless, farmers other than the model farmers had acquired the knowledge and skills for the water-saving practices from private agricultural consultants rather than the extension agents of the Project, and they did not make the best use of the technology. As for the cultivation technology with reduced fertilization, none of them (including the model farmers) adopted it.

(3) Achievements with regard to the Project Purpose

As explained above, Output 1 was attained within the project period but the level of achievement of Output 2 was low. It was considered, therefore, that the Project Purpose had not been attained. Although there were many probable factors that might have caused this result, the principal factor seemed to be the fact that the Project Purpose was too ambitious, given the time and resource constraints of the Project.

2 Summary of Evaluation Results

(1) Relevance

In reference to the "National Development Plan 2001-2006" and the "Sector Program for Agriculture, Livestock Farming, Rural Development, Fisheries and Food 2001-2006" of the federal government, a strong emphasis is given to the primary industry as the foundation of the welfare improvement for the citizens. Furthermore, soil conservation and efficient use of water are regarded as the priority issues in order to conserve the environment and secure the sustainability of the economy. Therefore, the Project was considered to be relevant to the policies of the federal government in that it intended to develop and disseminate the cultivation technology with reduced irrigation and fertilization, which were supposed to be effective for saving water and preventing soil contamination.

In the "State Development Plan 1999-2005" of South Baja California State, the efficient use of water in the agricultural sector is deemed important in consideration to the very limited availability of water resources in the state as well as the fact that agriculture takes by far the greatest share of the water. This indicates that the orientation of the Project is perfectly in line with the state policies as well.

On the other hand, the project period as well as the amount and the contents of the inputs did not match the scope of the Project; in other words, the Project Purpose was too ambitious for the given time and resource constraints. Moreover, problems were found in the logic of the plan of the Project. For example, the plan did not contain some activities that are logically indispensable to achieve the set objectives.

(2) Effectiveness

The Project Purpose was "the business performance of small/medium-scale farmers in the surrounding areas of La Paz, and it was supposed to be achieved through the following process;

- (a) the recommended crops were cultivated on the experimental and demonstrative basis,
- (b) the extension package was developed based on the results of the experimental cultivation,
- (c) the technology of cultivation with reduced irrigation and fertilization was transferred to the small/medium-scale farmers in the surrounding areas of La Paz, using the extension package, and
- (d) the introduction of the technology improved the profitability of the agricultural production (i.e. the Project Purpose was fulfilled).

The results of the evaluation study indicated that the level of achievement was moderate up to the point of developing the extension package but the stage afterwards, that is, technology transfer using the extension package, was unsatisfactory. Taking all these into account, the level of attainment of the Project Purpose was necessarily deemed low.

The reasons for the insufficient technology transfer were, among others, that the development of the extension package was delayed, and there were problems with the selection of the recommended crops and the model farmers. Nevertheless, the single most critical factor seemed to be the inadequate planning of the Project by attempting to develop and disseminate the extension package within the three years of the project period. Three years appear to be not sufficient to disseminate and internalize new cultivation technology, given the fact that it is time-consuming to demonstrate cultivation technology because it often takes several months to complete a cycle of cultivation, and small/medium-scale farmers tend to be conservative in adopting new technology. If a three-year-period is too short for the dissemination of the technology alone, it is naturally extremely challenging to add the technology development stage before the dissemination stage.

(3) Efficiency

Generally, the efficiency of inputs of Japanese experts and equipment was adequate. Due to the institutional restrictions of Tottori University, the Japanese experts, being the university personnel, could not stay in the project site for more than 2 consecutive months, and this affected the progress of the project activities to a certain extent. Having said that, the best effort was made to send the experts with maximum efficiency under the given institutional restrictions, and there was no sign of critical problems in terms of the efficiency of the project.

A few remarks are due with respect to the efficiency regarding the methodology of the technology transfer. First of all, the recommended crops, which were supposed to be the media of technology transfer, were difficult to sell in the market. Consequently, those recommended crops were not widely introduced to farmers and neither were the accompanying cultivation technology with reduced irrigation and fertilization. Furthermore, the model farmers, who were supposed to be the key to the technology transfer, were selected solely due to their willingness to be the model farmers. As a result, the selected model farmers lacked the aptitude that the Project expected of them, that is, they should have been the front-runners in adopting the new technology and should have disseminated it to the nearby farmers

(4) Impact

As to the primarily anticipated impact of the project, that is, the contribution to the realization of the Overall Goal, the positive impact of the Project on the Overall Goal was considered to be small because of the low level of attainment of the Project Purpose.

The impacts of the Project that were observed but not anticipated at the outset were as follows. As for the impact on the model farmers, one of them newly initiated agriculture, they began to show interest in the conditions of their own land and the management of water, and they understood the balance of revenue and spending of agricultural production. Regarding the impact on the staff of CIBNOR and Tottori University, the project triggered the initiation of exchange of academic information among some researchers of both institutes outside the project activities, and hence reinforced the academic exchange program between the two research institutes. Furthermore, many students of Tottori University (both undergraduates and postgraduates) visited the project site to work on the field practice while helping with the project activities. In this sense, the project provided the students of Tottori University with valuable opportunities of developing their academic career and the cross-cultural understanding.

(5) Sustainability

In the federal and the state government policies, the improvement of water use efficiency and soil conservation will continue to be priority issues. Therefore, the policy environment will remain favorable for the project.

After the cooperation period of the project, CIBNOR will succeed the task of disseminating the cultivation technology with reduced irrigation and fertilization that were not achieved within the cooperation period, and CIBNOR shows determination to undertake it at the time of evaluation. In recent years, CIBNOR has been committed to carrying out research that reflects the needs of producers in the field, rather than research for the sake of research, and feeds the research results back to the producers. In accordance with this policy, the technology transfer department was founded in 2002. The department currently has 21 staff members, and works actively on the formulation of technology transfer projects as well as the sales of technology and knowledge for private companies and farmers' groups. The sustainability of the project could be secured if the technology transfer department, which will take the responsibility of disseminating the concepts and achievements of the Project, could further develop institutionally, in terms of both budget and personnel, making the best use of internal and external funding sources.

3 Factors that promoted realization of effects

(1) Factors related to Planning

Water resources are extremely scarce in South Baja California State where the project target area is located, and agriculture takes by far the greatest share of water-use in the state. Furthermore, the region is under the threat of soil salinization and alkalization. Therefore, the development and dissemination of the cultivation technology with reduced irrigation and fertilization that the Project had intended precisely met the demand of the region, which in turn led to a certain level of the attainment despite various problems faced in the implementation stage of the Project.

(2) Factors related to the Implementation Process

During the first half of the project cooperation period, there was a lack of communication between the Japanese experts and the Mexican counterparts due to various reasons, such as (a) the ambiguous assignation of the counterparts to each expert because of differences in the fields of specialties, (b) a difference in attitudes towards field works in that Japanese experts considered that direct observation of the fields and farmers was indispensable for practical research whereas the counterparts, mostly researchers of CIBNOR, were not accustomed to going to the field themselves, and (c) language barriers and cultural

differences. Nonetheless, the efficiency of the project implementation was elevated dramatically as communication and relations between them began to improve gradually since the change of the Mexican-side project leader when counterparts were re-assigned in consideration of the opinions of both experts and counterparts. At the time of the evaluation, no one among either the experts or the counterparts perceived any problems in their relationship with each other.

4 Factors that impeded realization of effects

(1) Factors related to Planning

The plan of the project was considered to be too ambitious in that it had intended to achieve development of the cultivation technology with reduced irrigation and fertilization as well as its dissemination to farmers in the surrounding areas of La Paz within 3 years of the cooperation period. Besides, the original plan was to disseminate the technology through government extension agents in spite of the fact that the government extension program had been terminated more than 10 years before, and government extension agents no more existed. In response to the circumstances, it was decided that the staff of CIBNOR would play a role of the extension agents but they did not have much experience in technology transfer to farmers and, therefore, the dissemination activities did not proceed until the staff of the technology transfer department newly joined the Project as counterparts.

(2) Factors related to the Implementation Process

There were differences of opinions regarding the contents and the methodology of the development of the technical manuals that compose the extension package. As a result, the elaboration of the manuals was delayed, and some manuals were elaborated by Japanese experts alone because of a lack of cooperation of the counterparts. The delay of finalization of the manuals hindered the implementation of the technology transfer.

5 Conclusions

The cultivation technology with reduced irrigation and fertilization incorporating technology of soil conservation and management as well as the farm business administration was largely developed through the implementation of the project. In this process, valuable knowledge about sustainable development of agriculture in arid areas in South Baja California was acquired. On the other hand, the dissemination of the cultivation technology developed by the Project was yet to be undertaken. Considering the fact that (a) both Tottori University and CIBNOR had a strength in research and technology development while they had little experience in dissemination work, (b) the project cooperation period was 3 years, (c) the available funding is limited under "Development Partner Program", and (d) small/medium-scale farmers tended to be conservative against new technology, the Project should have focused on the development of the cultivation technology with reduced irrigation and fertilization in arid areas through experimental studies. Although the dissemination of the developed technology is apparently important as it affects the value of technology itself, the scope of the Project should have been kept up to the formulation of the basic strategy of dissemination of technology rather than extending to the implementation of the dissemination.

6 Recommendations

CIBNOR should disseminate the cultivation technology with reduced irrigation and fertilization after the project cooperation period. In carrying out the dissemination, there are 2 points to be noted.

First, farmers with a credit in the area should be identified and trained to be model farmers as the principal agents of the dissemination. Although small/medium-scale farmers tend to be conservative, they would try new technology and crops if they see the neighboring farmers making a success with them. This is how new technology could spread. For this purpose, it is necessary to develop technology that is easy to apply, make and sell instead of such technology as the products of laboratory research. Then, the bases of the dissemination (i.e. model farmers) need to be established. The characteristics required of model farmers are as follows; they are always willing to try something new, they will become very successful with a little more assistance, and they could give assistance to other farmers if they come to consult with them. Although farmers with all those characteristics are scarce, it is possible to identify them if one knew the area very well and construct a strong and extensive network with the farmers in the area. It is necessary to cooperate with such farmers and train them to be model farmers who are the principal agents of the technology transfer.

Secondly, CIBNOR should develop partnerships with small/medium-scale farmers in the surrounding areas of La Paz, and disseminate the technology to them while making the best use of external funds and resources. The Project had gone through the process of developing practical technology by experimental studies. Besides, the concept of the Project indicates that it is possible to cultivate crops even in arid areas like Baja California through conserving soil and reducing the use of water and fertilizer, and it should attract interests of the farmers in the area as well as donors inside and outside Mexico. With this methodology of technology development and the concept of the Project, it is important to develop and disseminate practical agricultural technology by utilizing national programs to support agricultural producers such as "Alianza Contigo" and "Fundación Produce" as well as international donor funds while maintaining partnerships with farmers in the region.

Another recommendation is to actively disseminate the concept of the cultivation technology with reduced irrigation and fertilization to other regions, for it is applicable and should be useful in other regions in Mexico. By disseminating this technology in other regions, additional crop land will be developed which would have been infertile without such technology, and this will contribute to the stable provision of food. As population growth is not the trend in Mexico only but the trend over the world, stable provision of food is the issue of the world. When the technology is spread in the surrounding areas of La Paz and the model of dissemination is established, it will be the time to consider the dissemination of the technology to other regions.

7 Lessons Learned

It is necessary to design the project framework in a way that the characteristics and the capacity of the cooperation's schemes and implementing organizations are properly taken into account. Each organization has its own characteristics, and the project should be designed to take advantage of the strengths of the organization by assessing the strength, the weakness, and the environment of the organization. Such characteristics and capacity of the organization can be assessed before the project starts by applying organizational diagnosis and enhancement skills such as ID/OS. In the case of JICA's technical cooperation projects, it is not common to assess the institutional capacity of the implementing organizations (on both the recipient country's side and Japanese side), that is, the operational capacity, before the initiation of the project. This evaluation study, however, revealed the needs for such assessments.

One of the principal reasons for the time it took to build an effective working relationship between the experts and counterparts is the fact that the counterparts were not given sufficient explanations about the JICA project and, therefore, misunderstood it. This misunderstanding caused complaints and a reduction in motivation. To avoid such situations, the Japanese implementing organization should explain the system and the regulations of JICA projects to the counterparts and make them understood before the project starts. In addition, the project activities were delayed in the beginning of the Project because of the lack of smooth collaboration between the experts and the counterparts due to a difference in the classification of specialties. When the projects are initiated, the implementing organizations of both the donor and the recipient countries need to have opportunities to communicate and enhance the mutual understanding about the regulations and situations of the other organization. The plan of the project based on such dialogues and mutual understanding would become the foundation of implementing effective cooperation projects.

Adequate management is indispensable for effective and efficient operation of the project. In many cases, however, PDM of the project is not utilized well during the implementation stage of the project. It is, therefore, desirable to require the implementing organization to prepare quarterly reports describing the progress of activities as well as the achievements of outputs and project purpose in accordance with PDM. This will also provide opportunities to revise PDM in the implementation stage to ensure that it is consistent with present situations.