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Plurinational State of Bolivia

Ex-post Evaluation of Japanese Technical Cooperation Project

“The Improvement of Technical Extensions for Small-Scale Livestock Farmers Project”

External Evaluator: Tsuyoshi Gomi, Tekizai Tekisho Organization

## 0. Summary

This Project was promoted to produce adequate livestock technique improvements for small-scale livestock farming business in the area targeted in this Project<sup>1</sup> to extend to small-scale livestock farmers the techniques transferred to and accumulated in the Centro Nacional de Mejoramiento de Ganado Bovino (CNMGB) as a result of Japan’s cooperation to date. In so doing, the Project was implemented with the aims of establishing a technical extension model for ensuring that the farmers acquire the technique through technical extension workers’<sup>2</sup> capacity improvement and extension system enhancement, and of increasing productivity by spreading the use of the techniques among the small-scale livestock farmers in the Yapacaní region in Santa Cruz.

This Project was consistent with the National Development Policy of the Bolivian government, the needs of the Santa Cruz Department and the target areas where the Project was carried out, and Japan’s ODA policy. Therefore, the relevance was high. The results aimed to be obtained at the end of the Project, and the Project objectives were all realized. Moreover, in the ex-post evaluation, the Project was considered greatly beneficial to raw milk productivity improvement in the target areas, technical diffusion among farmers, and technological spillover effects spread among villages/communities, ensuring a high degree of effectiveness and significant impact at the level of the farmers. As far as inputs from the Japanese side are concerned, it was considered necessary to partly review and improve the dispatch of relevant Japanese experts; however, the strengthening of a technical extension support system in cooperation with 5 associated organizations allowed the specified results and the Project objectives to be achieved within the term of cooperation. In addition to this, the amount of cooperation funds fell within the planned budget; so the assumption can be made that the Project was very efficient. After the Project, 3 out of the 5 associated organizations suspended their extension activities, while the remaining 2 are still actively developing the activities with the Project results continually produced for farmers. However, the Project executing agency underwent a major change in system and their support for the extension activities has not been maintained. In ensuring the further development of the Yapacaní region through mutual coordination among the agencies, the sustainability of the Project effects can hardly be expected because there are still some challenges in terms of the sustainability of the relevant policy, structure, system,

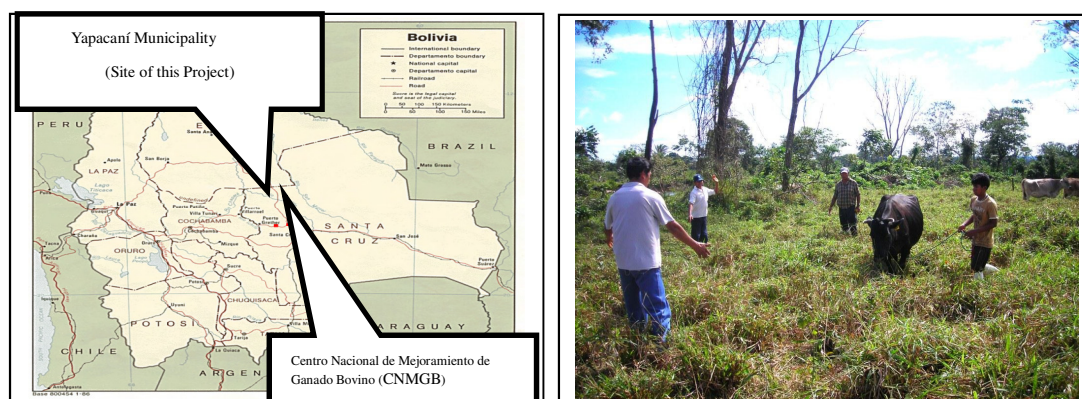
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<sup>1</sup> The southern part of the Yapacaní region in Ichilo County, the site implementing the internal migration policy, which has a large number of small-scale livestock farmers

<sup>2</sup> “Technical extension workers” in this Project means stockbreeders’ associations actually in charge of disseminating livestock techniques in Bolivia and specialists independently hired by NGOs, not the so-called “extension workers” belonging to Japanese authorities.

technologies, and finances. In light of the above, this project is evaluated to be satisfactory.

## 1. Project Description



(Project Location)

(Raising Crossbred Cattle as Dairy Stock)

### 1.1 Background

In Bolivia, the agricultural sector is one of the major industries; it contributes 15.6% to the GDP and its workforce accounts for 44% of the entire working population. This has encouraged the Bolivian government to make an enormous effort increasing the productivity of agriculture and cattle breeding, its major industries, and establishing the sustainable system for developing and diffusing agrotechnology, and especially developing the production chain mainly for the livestock industry including “beef cattle breeding” and “dairy farming.” Under these circumstances, Japan has provided cooperation based on “Livestock Breeding Improvement Project (1987-1994)” and “The Beef Cattle Improvement Project in the Republic of Bolivia (1996-2003)” to transfer various types of livestock techniques to the country. However, the technology and knowledge transferred for technical research institutes has not been improved to be appropriate for small-scale livestock farmers, which have prevented livestock farmers facing financial difficulties from implementing it. In Bolivia, moreover, the necessary techniques have been extended to the farmers by each local stockbreeder’s association or NGO in their own limited way since the country has no official system to support the extension. The technical levels of extension workers belonging to each association are low and the training for them lacks coherence; this has led to the present state of affairs where appropriate techniques are not sufficiently extended to small-scale livestock farmers. As a result, those farmers’ low levels of dairy and beef cattle<sup>3</sup> breeding techniques and hygienic control technology, and lack of information on necessary techniques are a major reason preventing the techniques of farmers in each sector from reaching basic standards. As these problems have seriously

<sup>3</sup> The small-scale livestock farmers raise crossbreds as both dairy and beef cattle and earn regular income from dairy products including raw milk and cheese. (According to the Ex-ante Evaluation)

affected small-scale livestock farmers' milk yields, it has been expected that technical improvements, appropriate for those farmers, can be achieved and the techniques can be introduced to the farmers clearly and accurately. Consequently, with the CNMGB, which has its knowledge of livestock techniques playing a central role, technical improvement for small-scale livestock farmers, extension workers' capacity improvement, and extension system reinforcement were facilitated with Japanese cooperation; and then a request to run this Project to establish a technical extension model, which can also be applied to other regions, was made to start this four-year Project in December 2004.

## 1.2 Project Outline

Overall Goal		The productivity of small-scale livestock farmers in Yapacaní Municipality is improved.
Project Objective		Extension Model is developed for small-scale livestock farmers in Yapacaní Municipality.
Outputs	Output 1	The system for extension activities is established.
	Output 2	Adequate techniques for small-scale livestock farmers are adapted.
	Output 3	Extension workers are trained and appropriate extension activities are executed.
	Output 4	Livestock technique is extended to Model Groups.
Inputs		<p>Japanese Side:</p> <ol style="list-style-type: none"> <li>1. Experts 6 in total (4 for Long-Term, 2 for Short-Term)</li> <li>2. 8 Trainees received (for Counterpart Training Course in Japan)</li> <li>3. 14 Trainees for Third-Country Training Programs (total)</li> <li>4. Equipment 11.98 million yen</li> <li>5. Local Cost 25.55 million yen</li> <li>6. Others (incl. dispatch of related missions)</li> </ol> <p>Bolivian Side:</p> <ol style="list-style-type: none"> <li>1. 13 Counterparts, 1 Secretary, and 1 Driver</li> <li>2. Land and Facilities: Provided by CNMGB Headquarters Office, Yapacaní Extension Activity Office, Universidad Autónoma Gabriel René Moreno (UAGRM), Unidad Académica de Yapacaní (UNAYA) Agricultural and Stock-farming Experiment Station</li> <li>3. Local Cost 3.77 million yen</li> </ol>
Total Cost		238 million yen
Period of Cooperation		December 2004 - February 2008
Implementing		Centro Nacional de Mejoramiento de Ganado Bovino (CNMGB)

Agency	
Cooperation Agency in Japan	Ministry of Agriculture, Forestry and Fisheries
Related Projects	“Livestock Breeding Improvement Project (1987 – 1994)”, and “The Beef Cattle Improvement Project in the Republic of Bolivia (1996 – 2001)”

### 1.3 Outline of the Terminal Evaluation

#### 1.3.1 Expected Achievement of Overall Goal (incl. Other impacts)

Looking at each Model Farmer (Ganaderos Modelos), some cases are reported where raw milk yield and productivity showed great improvement after the Project. Therefore, it was considered that the goal would be achieved on a long-term basis. For achieving the overall goal, it is necessary for the Technical Extension Committee consisting of the agencies and associations concerned to set up the system and strategy for maintaining the Project outputs or the developed Model.

#### 1.3.2 Expected Achievement of Project Objective

Taking the activities of grouping livestock farmers based in the target area with Model Farmers into account, setting it as the core of this objective, training extension workers in associated organizations, and establishing the extension model based on improvement technology, only one of the expected concrete results, Output 4, has not been achieved. However, it is likely that this will be attained, too<sup>4</sup>. Thus, the probability was judged to be high that the technical extension model would be finished by the end of this Project.

#### 1.3.3 Recommendations

Short-term Suggestions made at the terminal evaluation	The Resulting Status Corresponding to Each Suggestion at the End of the Project
To designate a person in charge of technical extensions in the Project so as to maintain cooperation among organizations	The chief of the Project executing agency was assigned as the person in charge.
To formulate rules and regulations of the Extension Committee where associated organizations gather and discuss extension activities after the Project	Rules that the Extension Committee should be held periodically (once a month), and a proxy has to be selected and he/she must take part in the Committee if the representative of each agency is absent were devised.
To organize the Extension Committee by choosing suitable persons from each associated agency	The representative was selected from each associated agency and the Committee was held once a month.
To incorporate into the Extension Committee the suitable rules to let extension workers conduct stable activities, with the Extension Committee positioned as superior to	The Extension Committee was positioned at the level of the Working Committee. To ensure that extension workers conduct stable activities, rules

<sup>4</sup> The level for the Project objective attainment is about 92%, and the one for each output about 93% (on a percent basis respectively) in post-project evaluation.

the existing Committee	that a budget for each activity should be discussed and technical support organizations <sup>5</sup> are to be the members consisting of the Committee were incorporated into its organizational regulations.
To establish rules and regulations about the revision of the Extension Committee	Rules and regulations, for example, to require the Committee approval, were incorporated into its organizational regulations for extension activities.

Medium- and long-term Suggestions made at the terminal evaluation	The Resulting Status Corresponding to Each Suggestion in ex-post evaluation
To expand the function of the Extension Committee to secure its sustainability	The expansion of the Extension Committee to secure revision of its rules and regulations was not made and regular meetings were not held. One of the main reasons for this is that the executing agency did not continue the expansion activities and failed to take the initiative to make the necessary adjustments.
To ensure that technical teams classify farmers by milk production when selecting Model Farmers	No specific progress can be seen because the executing agency did not continue the extension activities.
To ensure that Ministerio de Desarrollo Rural, Agropecuario y Medio Ambiente (MDRAyMA) perform periodic follow-ups concerning the extension activities while making necessary adjustments in close cooperation with local agencies	A research interview with the executing agency and the Ministry of Agriculture found that MDRAyMA did not conduct periodic follow-ups regarding the extension activities by making the necessary adjustments with local agencies after the Project. The chief factor behind this is the situation where MDRAyMA could not participate in the follow-ups due to a change of the system including the rules and policies of UAGRM. However, MDRAyMA and UAGRM started to foster a harmonious relationship as illustrated in the example where they discussed the plan that the government would buy up cattle sperm to distribute among farmers from 2012. On the basis of such a relationship, monitoring activities will be conducted.
To support the systematization of farmers for allowing them to gain access to agricultural financing and revolving funds so as to strengthen support components for increasing input	It became possible for Asociación de Productores de Leche (ASOPLEA) to obtain access to agricultural financing and revolving funds. For further details, please refer to the “Impact” part.

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Tsuyoshi Gomi (Tekizai Tekisho Organization)

<sup>5</sup> As technical support organizations, Universidad Autónoma Gabriel René Moreno (UAGRM), la Federación de Ganaderos de Santa Cruz (FEGASACRUZ), Federación Departamental de Productores de Leche (FEDEPLE), Asociación de Criadores de Raza Lechero (ASOCRALE), Asociación de Criadores de Cebu (ASOCEBU) participated.

## **2.2 Duration of Evaluation Study**

In performing the ex-post evaluation this time, the study was conducted by following the schedule described below:

Duration of the Study: November 2011 - July 2012

Duration of the Field Study: January 26, 2012 - February 26, 2012, June 30, 2012 - July 8, 2012

## **2.3 Constrains during the Evaluation Study**

CNMGB, the Project executing agency, did not conduct periodic monitoring activities after the Project, resulting in the unavailability of information required for evaluation and judgment concerning the overall goal. Among the producers' associations and authorities worked in concert with in this Project, only Asociacion de Productores de Leche (ASOPLE) managed statistical data related to farmers in the target area; the data was utilized for evaluating and judging the overall goal<sup>6</sup>. Therefore, it should be noted that the data does not cover all the information gained in the entire area targeted in the Project as far as the goal attainment level.

# **3. Results of the Evaluation (Overall Rating: B<sup>7</sup>)**

## **3.1 Relevance (Rating ③<sup>8</sup>)**

### **3.1.1 Relevance with the Development Plan of Bolivia**

Estrategia Boliviana de Reduccion de la Pobreza (EBRP) and Estrategia de Transformación Productiva Agropecuaria (ETPA) of Plan Bolivia, developed when the Project was planned, continued to be executed as Plan Nacional de Desarrollo (2006-2011) under the administration of Juan Evo Morales Aima. The new Plan regarded the support for small-scale or smallholder farmers and poverty reduction as its major challenges. And in the "Agricultural Sector Development Plan" formulated by MDRAyMA in 2007, programs were promoted to develop farmers and agricultural regions with the improvement of agricultural and cattle-breeding productivity, technical development on the basis of production chains, and the improvement of the nutritional status of smallholder farmers as the pillar of its main policy. Among them, the "Creacionn de Iniciativas Alimentarias Rurales (CRIAR)" program positioned small-scale livestock farmers' production development as a key task in policy matters, making efforts to ensure that high-quality agricultural and livestock products are produced and provided to local markets.

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<sup>6</sup> Although hearing surveys with Santa Cruz Department (Departamento de Santa Cruz) and Yapacaní Municipality (Honorable Alcaldía Municipal de Yapacaní) were also carried out, it turned out that they did not understand the milk yield of Yapacaní Municipality.

<sup>7</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>8</sup> ③: High, ②: Fair, ①: Low

As it can be seen from the above, this Project supported livestock technique extension in the field of dairy farming for small-scale farmers. In this regard, the Project was consistent with the farming policy of the Bolivian government.

### 3.1.2 Relevance with the Development Needs of Bolivia

In the Santa Cruz Department, a district in the target area of this Project, the livestock industry is positioned as one of the major economic activities. According to FEDEPLE, about 6,000 families living in rural areas in the Santa Cruz Department are engaged in livestock raising, 80-90% of which are small-scale livestock farmers. On the other hand, the same areas are suffering from a high poverty rate (64%). This rate is perceived as a problem; adequate techniques have not been extended to small-scale livestock farmers living in the rural areas, which is a major obstacle to productivity improvement. As measures to fight poverty in the Santa Cruz Department, in a word, there is a tremendous need for improving the technical levels of small-scale livestock farmers and their productivity. Given this backdrop, this Project established a necessary livestock technique extension system and training personnel to provide technical support for productivity improvement as the Department's important policy challenge.

In the Yapacaní region, the area targeted in this Project, the farmland of the northern region is used for rice cultivation, and the southern region adopts the farming system mainly for cattle raising because many parts of its land are unfit for dry field farming<sup>9</sup>. The Project selected small-scale livestock farmers in the southern region of Yapacaní as its target group, 60% of which nurture only 10-30 heads of cattle. And 90% or more of the whole livestock farmers raise crosses between dairy cattle and beef cattle as dairy stock; their source of income comes from selling raw milk, dairy products (e.g., cheese) and feeder calves. Most of the small-scale livestock farmers are internal migrants who were encouraged to move from the highlands to lowlands by the Bolivian Government. The problem here is that a milk yield from one cow is extremely low (only 4 liters) according to ASOPLEA since their breeding management technology is insufficient. Therefore, this Project targeted such farmers and planned appropriate technical development aiming at an increase in milk yield in milk production and a business based on support components setting the organization of a technical extension system as its main activity.

A beneficiary survey, covering 127 persons in total from Model Farmer Groups and GTT (Grupos de Transferencia de Tecnología)<sup>10</sup>, shows that as for the consistency of small-scale livestock farmers

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<sup>9</sup>According to ASOPLEA, 80% or more of livestock farmers in the Yapacaní region carried out their farming activities in districts in the southern region at the time of the ex-post evaluation.

<sup>10</sup> A GTT (Grupos de Transferencia Tecnologías) method is an extension method in which grouped core farmers consisting of about ten members respectively hold study sessions on their own initiative and conduct study tours for new production methods on a continual basis under the guidance of relevant extension workers.



27 persons with extended techniques developed in the Project, 34% of those surveyed answered “Consistency was very high,” and 57% “Consistency was confirmed.” A major contributing factor to this positive result is considered to be an effective technical extension; to be more precise, an appropriate technique was extended to the Model Groups or GTT after the technique was developed in the Model Farmers’ demonstration farm lands. This led to the high relevance of the Project with the technical needs of small-scale livestock farmers, this Project’s beneficiaries.

It is also clear from the above that this Project was consistent in terms of the selection of its target areas and regional needs, and support components set for this Project were also appropriate.

Table 1: Consistency of Beneficiaries’ Needs with Extended Technology

Consistency of Beneficiaries’ Needs with Extended Technology	
Consistency was very high	34% (43 persons)
Consistency was confirmed	57% (72 persons)
Consistency was confirmed to some extent	9% (11 persons)
Consistency was not confirmed	0% (0 person)

(Source: Beneficiary Survey)

### 3.1.3 Relevance with Japan’s ODA Policy

The country-specific program of the Japan International Cooperation Agency (JICA) points out “the improvement of both agrotechnology and its extension system” as challenges to be addressed in the field of agriculture and rural development in Bolivia. It also espouses “agrotechnology development and the establishment of the extension system in humid tropical regions over which Japan has a comparative advantage” as its cooperation policy for Bolivia, formulating the “Program for Agrotechnology Extension in Humid Tropical Regions” as a programmatic approach in the agricultural sector. Consequently, the relevance of this Project with Japan’s ODA policy was high.

### 3.1.4 Appropriateness of Cooperative Approaches

As regards the establishment of a technical extension support system, CNMGB is the one and only research and educational institution in the field of livestock and dairy farming in the Santa Cruz Department, which has a series of accumulated technical knowledge regarding livestock and dairy farming as a result of Japan’s technical cooperation to date. This led CNMGB to act as an agency to implement the Project, and made cooperative approaches for developing appropriate techniques for small-scale livestock farmers, ensuring that core farmers (e.g., Model Farmer Groups and GTT) in the Yapacaní region acquire and make full use of the technique in teamwork with extension workers of associated organizations<sup>11</sup> (2 associations, a farmers’ organization, a university, and an authority),

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<sup>11</sup> Livestock farming associations (ASOPLEA, Asociación de Ganaderos de Yapacaní (AGAYAP)), a university (Unidad Académica de Yapacaní (UNAYA)), a farmers’ organization (Federación Sindical de Colonizadores

and extending the technique to and spreading technological spillover effects to small-scale livestock farmers in the same region. It can be said that these approaches are appropriate in order to solve challenges in popularizing the livestock industry in Bolivia with no official extension support system and insufficient technical extension service for farmers.

With reference to MDRAyMA, CNMGB's superagency, it turned out that it had a policy intention to determine the effectiveness of the system for extending proper techniques to farmers in close cooperation with universities, private associations, and citizens' organizations. A hearing with the relevant personnel at the time of the ex-post evaluation, moreover, found that it aimed to improve the technical competence of extension workers and the productivity of small-scale livestock farmers through this type of extension support system establishment.

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

### 3.2 Effectiveness and Impact<sup>12</sup> (Rating ③)

#### 3.2.1 Effectiveness

##### 3.2.1.1 Project Outputs

##### 1) Output 1

Output 1 aimed for the goal that associated organizations build a system necessary for extension activities. At the time of terminal evaluation, the following activities were conducted: (a) select 5 Model Groups (from associated organizations), (b) choose 11 extension workers, and (c) form the Technical Extension Committee and hold its regular meetings. Likewise, in the ex-post evaluation, extension workers were assigned to selected groups and the regular meetings of the Extension Committee were held smoothly. Given the above, the system for extension activities succeeded in being improved.

Table 2 : Change Observed in Extension System Established by Associated Organizations  
(Change in Number of Extension Workers)

Name (Initialism) of Associated Organization	Number of Extension Workers at the Time of the Terminal Evaluation	Number of Extension Workers at the Time of Ex-post Evaluation
ASOPLEA	3	5
UNAYA	2	2
AGAYAP	1	0
FSCPAPIY	3	0
HAMY	2	0
Total	11	7

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Productores Agropecuarios Provincia Ichilo – Yapacaní (FSCPAPIY)), and a governmental body (Honorable Alcaldía Municipal de Yapacaní (HAMY))

<sup>12</sup> Ratings are assigned by making judgments as to the effectiveness with impacts taken into consideration.

The following are descriptions of the status of associated organizations that also maintain the system at the time of the ex-post evaluation.

In ASOPLEA, extension workers who acquired high livestock techniques through the Project provide livestock farmers with technical support. As it produces milk on a commercial basis, funds for extension activities are secured and the extension system is maintained. And in UNAYA, its extension workers continue extension activities in the form of providing training to GTT. UNAYA realizes technical training in a self-supporting accounting system, by collecting training fees from participants. The other three associated organizations stopped the activities, and AGAYAP, an association for livestock farmers, also suspended the activities because its business objective places more weight on beef production, its financial base is weak, and funds to support the activities cannot be secured. FSCPAPIY, a political pressure group, is strong in favor-based business, but does not continue its extension activities owing to its indifference toward the activities themselves and weak financial base. And HAMY also stopped activities because of a change of leadership even though it continued the activities by creating a budget for an extension until 2010.

From the viewpoint of the continuation of extension activities in organizations, only the organizations that can raise funds to support extension activities on their own continue the activities. The other organizations could not continue the activities because they could not secure funds for the activities; they lost interest in the activities related to the Project after any external support became unavailable because their organizational missions did not include technical extensions, or they, as authorities, could not continue consistent extension activities owing to political factors. Although some organizations had no extension system established and maintained at the time of the ex-post evaluation, the extension system developed through this project has been maintained by ASOPLEA, of which about 40% of farmers producing milk in the Yapacaní region are its members.

## 2) Output 2<sup>13</sup>

The goal of Output 2 was the development of techniques useful for improving the productivity of small-scale livestock farmers (e.g., for livestock-raising management, breeding, hygiene control, and grassland management); to be more precise, it aimed at the improvement of the average milk yield from dairy cattle of Model Farmers by 50% and a breeding coefficient by 20%. At the time of the terminal evaluation, as a result, the milk yield per dairy cow increased by 60.7% and the breeding coefficient rose by 31%. Viewed in this light, the goal of Output 2 was attained at the time of the terminal evaluation.

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<sup>13</sup> Since there is no data on Output 2-4 on completion of the Project, data gained after the Project and at the time of the Ex-post evaluation are compared.

In the ex-post evaluation, moreover, a beneficiary survey of Model Farmer Groups<sup>14</sup> showed that 41% of the farmers experienced a 50% rise in milk yield, and great productivity improvement. On the whole, 89% of the farmers answered that their milk yield per dairy cow increased by 30% or more (For further details, please refer to “Other Impacts” in 3.2.2.1). As for breeding coefficient improvement, relevant data with high accuracy was not obtained because the farmers kept no necessary records or had only vague memories.

In response to the question about techniques that were effective in improving productivity, the most popular reply, at 27%, was the technology for “Paddock Management and Effective Utilization of Electric Fences.” Proper paddock management allowed pasture grass to grow in an appropriate manner and enabled cattle to eat more food than ever, contributing to an increase in milk yield, while the implementation of electric fences made it possible to leave more space between the fences, which reduced barbwire fences to realize cost reductions. The interviews with the beneficiaries revealed that other benefits obtained from the implemented technique such as the ease of technical introduction, an increase in milk yield, cost reduction, and the reduction of the workforce also gained the farmers’ favor. Such technical introductions consequently increased milk yield per dairy cow.

Table 3 : Techniques Evaluated and Implemented by Beneficiary Farmers<sup>15</sup>

Implemented Technique	Ratio of Farmers that Implemented Technique (Number of Persons)
Paddock Management and Effective Utilization of Electric Fences	27.0% (34)
Milking Plant Management	15.0% (19)
Creation of Incubation House and Nursing Calves	15.0% (19)
Anthelmintic Treatment (Repelling Ticks)	14.3% (18)
Twice-a-day Milking	7.7% (10)
Creation of Stand for Cattle to Lick Salt and Effective Utilization of Added Salt (Iodized Salt)	6.0% (8)
Effective Utilization of Green Feed	6.0% (8)
Effective Utilization of Concentrated Feed-stuff for Adult Cattle and Calves	5.5% (7)
Udder Treatment	3.5% (4)
Total	100.0% (127)

(Source: Beneficiary Survey)

### 3) Output 3

The goal of Output 3 was the training of extended workers, and more specifically, aimed to develop the skills of 140 local extension workers and technical extension experts to conduct extension activities by making use of relevant manuals. The terminal evaluation showed that the training helped develop 127 extension workers and technical extension experts (90.7% of the total)

<sup>14</sup> 60% of those surveyed in the beneficiary survey were members of ASOPLEA.

<sup>15</sup> A beneficiary survey was conducted with model farmer groups and GTT groups; 127 persons from the groups answered one of the introduced technologies that they considered useful for raising livestock and producing relevant products and actively adopted.

who could carry out the activities according to the manuals targeted for extension workers. By the time of Project completion, 11 training sessions in total to develop extension workers were conducted for 165 trainees (exceeding the target number). From this, it can be said that a sufficient number of extension workers were trained and acquired the necessary skills by the time of Project completion.

According to the results of the beneficiary survey with the target farmers in the ex-post evaluation, only 41% of the farmers answered that relevant local extension workers and technical extension experts continued extension activities after the Project. This means that only half of the trained extension staff or less continued their activities; it was mainly the extension staff belonging to ASOPLEA who continued the activities.

Since the extension manuals prepared for the training were thought to cover all the information necessary for the extension with practical content, the ASOPLEA extension workers had continued to use them. After the Project, however, the manuals are available only for the already trained extension workers because no training to develop extension workers is now carried out. As a result, at the time of the ex-post evaluation, a proper environment to develop extension staff was not secured because enough experience for training extension workers had not been accumulated and the staff had not been able to gain the opportunities to promote constant technical improvement.

#### 4) Output 4

Output 4 set the goal to make the technique that was introduced to Model Groups fully established and utilized. The terminal evaluation showed that 46% of farmers (151 persons) of the Model Groups succeeded in utilizing the transferred technique on which the relevant training was provided.

The result of the beneficiary survey conducted at the time of the ex-post evaluation indicates that 114 persons out of 127 (89.8% of the total) of the farmers which promoted the utilization of the transferred technique continue to make use of all of or part of the technique. Among them, the farmers utilizing all of the technique account for 38.6%, the ones utilizing part of them, 51.2%; although each of the rates did not reach the percentage of techniques fully established and utilized that the Project set as its numerical target (60%)<sup>16</sup>, it can safely be said that this percentage was comparatively high. Of special note is the large number of types of techniques that farmers greatly need; as much as 38.6% of the farmers utilize all types of the techniques in spite of the fact that they are not provided with all of them as one set for extension. But some of them are put together whenever necessary.

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<sup>16</sup> As for this numerical target, 60%, and the definition of the percentage of transferred technique fully established and utilized, there is no description of them in the relevant documents of this Project.

Table 4 : Percentage of Transferred Technique Fully Established and Utilized

Utilization of Technique	Utilization Ratio (Number of Persons)
Continuing to Utilize All Types of Techniques	38.6% (49)
Continuing to Utilize Part of Techniques	51.2% (65)
Not Continuing to Utilize Techniques	10.2% (13)
Total	100% (127)

(Source: Beneficiary Survey)

As the technical transfer did not require huge costs and even small-scale farmers could implement it, noticeable improvements in productivity were provided. Therefore, some major factors contributing to technical establishment and utilization can be recognized; for example, the facts that the target farmers could easily see the possible utilization of and the effects and results of the technique implemented by the Project, which was easy to observe the technique.

#### 3.2.1.2 Achievement of Project Objectives

The Project objectives were set for establishing a technical extension model for small-scale livestock farmers in the Yapacaní region in Ichilo County. As indicators for judging the objective attainment, it was required that 5 extension workers continue their extension activities to increase milk yield gained from dairy cattle raised in relevant Model Group Farmers by 30%, and 60% of the farmers continue to utilize the transferred technique.

At the time of terminal evaluation, the rate of increase in milk yield per one dairy cow was 38.7%, the number of extension workers who continued adequate extension activities was 11, and the percentage of the farmers who continued to utilize improved techniques was 46%. Given these numerical values, the ratio of transferred technique utilization was 14% below the target figure. However, it can be said that the proper technical extension model was established since an increase in milk yield was confirmed, the extension workers continued adequate extension activities as indicators, and relevant associated organizations also conducted extension activities.

Then the ex-post evaluation found that 7 extension workers continued relevant extension activities for the target Model Groups. As described in Output 4 in 3.2.1.1, furthermore, 89.8% of the total people of the Model Group Farmers continued to use the relevant improved technique at the time of the ex-post evaluation, proving that all the criteria as indicators for judging the Project objective achievement are also met at the above-mentioned time. What contributed greatly to the Project objection achievement were the continuous approaches of ASOPLEA extension workers who acquired more appropriate breeding techniques and the extension methods under the guidance of CNMGB or Japanese experts for extending the necessary technique to farmers in the Yapacaní region. Although some of the associated organizations stopped their extension activities, technologies transferred from CNMGB, the project executing agency, were acquired and thoroughly understood by ASOPLEA extension workers. The result is that the system for technical extension in

the Yapacaní region, with the task of technical extension taken over by ASOPLEA of which many target farmers are members, has been maintained even though the relationship between CNMGB and relevant associated organizations was not sustained at the time of the ex-post evaluation.

### 3.2.2 Impact

#### 3.2.2.1 Achievement of Overall Goal

##### 1) Indicator

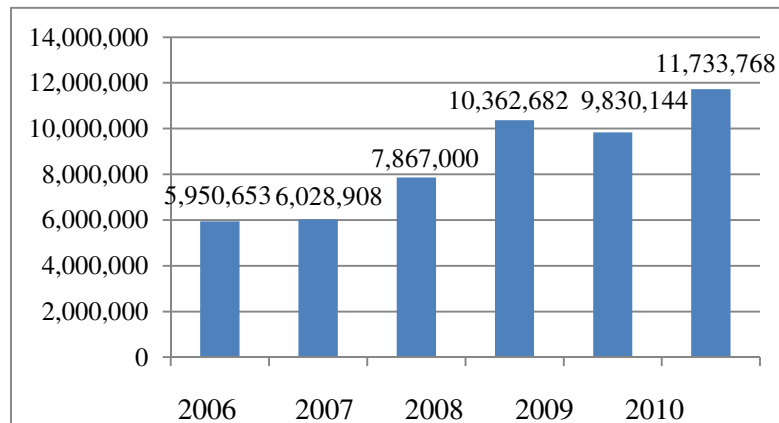
The indicator for the overall goal is CNMGB and relevant associated organizations were not sustained at the time per dairy cow by 2013. The problem here is that the executing agency did not perform monitoring activities with no data on the actual milk yield; so that no report on the status of the overall goal achievement using this indicator in the Yapacaní region can be presented. According to the data of ASOPLEA, which is active in the area targeted in this Project (shown in Fig. 1 below); however, the annual milk yield of member farmers of ASOPLEA tends to increase. Comparing the yield after the Project in 2008 with the one at the time of the ex-post evaluation in 2011, the yield was increased by 67%. And ASOPLEA reported that its member farmers' average milk yield per dairy cow reached about 9 liters. This is because that it ensured the extension workers who acquired high-level livestock techniques through the Project having provided technical support to relevant livestock farmers. When this figure is compared to the average milk yield per dairy cow in the case of non-member farmers of ASOPLEA, about 4 liters, the ratio stood at around 2-1<sup>17</sup>. In Yapacaní Municipality, about 40% of farmers producing milk are members of ASOPLEA. As this association gives technical support to local farmers and establishes the system to offer consultation to them, a sufficient impact can be recognized in the Yapacaní region. Therefore, at least ASOPLEA member farmers producing milk have achieved the overall goal easily and in a highly efficient manner<sup>18</sup>.

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<sup>17</sup> At first, ASOPLEA had only an undeveloped conservation technique and could not conduct milk sanitation inspections, failing short of the standards for quality conformance inspection of major dairy companies. In this Project it estimated an increase in milk yield in the Yapacaní region and set up the association's cooling stations by using grant aid. Moreover, the increase in production as a result of support for farmers provided in the Project made its milk treatment capacity increase from 500 liters a day at the start of the Project to about 50,000 liters a day. This enabled it to provide major dairy companies with a stable supply of milk.

<sup>18</sup> According to ASOPLEA, 80% or more of livestock farmers targeted in this Project are concentrated in the southern region of Yapacaní Municipality, where about 750 people are estimated to be mainly engaged in producing milk or cheese. As of July 2012, there were about 300 member farmers of ASOPLEA; they account for about 40% of the total members.

Fig. 1: Change in Annual Milk Yield (liter) of ASOPLEA Member Farmers



(Source: ASOPLEA)

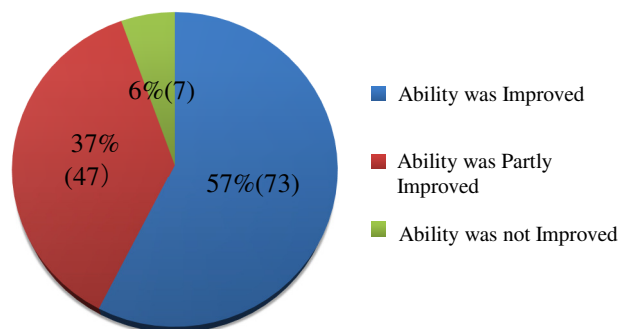
### 3.2.2.2 Other Impacts

#### 1) Impacts on Beneficiaries in Terms of Improvement of Technical Ability in Breeding

The beneficiary survey revealed that 57.8% of the target farmers answered that their “Ability Was Improved at 57.8% of the target farmers acquired through the Project (including training and seminars), and 36.7% of them answered their “Ability Was Partly Improved. 94.7% of the respondents recognized that their technical abilities in breeding improved through this Project.

Fig. 2: Contribution to Farmers’ Ability Improvement

(Number of Respondents Shown in Parentheses)



(Source: Beneficiary Survey)

#### 2) Impact on Productivity Improvement

In the beneficiary survey conducted at the time of the ex-post evaluation, 89% of the Model Farmer Groups answered that they could increase their milk yield per dairy cow by 30% or more. 41% of them, moreover, saw significant productivity improvement, a 50% increase in milk yield.



Table 5 : Status Concerning Increase in Milk Yield of Farmers in Model Groups at the Time of Ex-post Evaluation

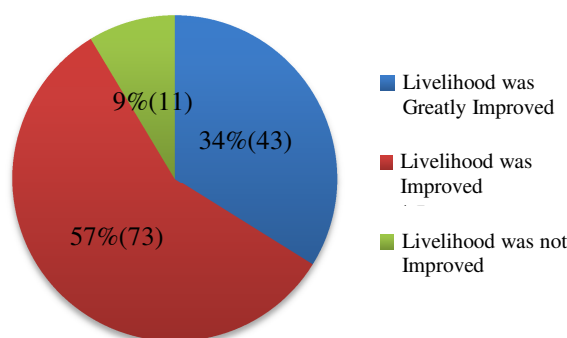
Increase in Milk Yield per Dairy Cow	Percentage of Farmers Whose Milk Yield Increased (Number of Persons)
10%	1.1% (1)
20%	9.5% (12)
30%	21.1% (27)
40%	24.2% (31)
50%	41.1% (52)
50% or more	2.1% (4)
Total	100% (127)

(Source: Beneficiary Survey)

### 3) Impact on Livelihood Improvement

According to the beneficiary survey, 91% of the target farmers answered that their livelihood was improved by technologies and knowledge acquired through the Project. There is no question in that productivity improvement and technical establishment and utilization were the driving force behind this result. The interview with relevant beneficiaries showed that the livelihood improvement was realized by the factors that raw milk and dairy products are not major products for home use, and that an increase in production tends to be directly linked to an increase in income because distribution routes are secured by the association.

Fig. 3: Improvement in Livelihood of Farmers (Number of Respondents Shown in Parentheses)



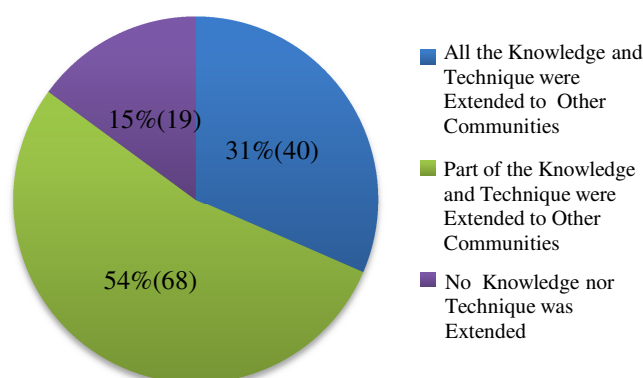
(Source: Beneficiary Survey)

### 4) Impact on Other Farmers

Great benefits for farmers as a whole can be recognized in view of the current status of the technical extension among farmers with the core farmers such as Model Group Farmers and GTT farmers at the nucleus. The result of the beneficiary survey shows that 83 respondents out of 127 in total (65.6% of the total) of the target farmers introduced the techniques gained through the Project to their friends, acquaintances, and relatives. Consequently, the techniques were transferred from extension workers to core farmers, and from the core farmers to conventional farmers. We could see this kind of technical extension not only among farmers in their villages but also in the communities

around the villages. As shown in Fig. 4 below, an enormous number of respondents (84.8% of the total) answered that they had disseminated their knowledge and information to the communities around their villages in some way. From this data, it can be said that the knowledge and techniques introduced through this Project were extended and became established widely in small-scale farmers. In the area targeted in this Project, ASOPLEA takes the lead in holding regular technical extension workshops. The interview with the relevant beneficiaries showed that in these workshops held by the association many conventional farmers became active participants because they got interested in the technique through word of mouth – that is, by obtaining the information given verbally from the core farmers. They made use of these opportunities to learn new breeding techniques, and appropriate techniques were extended and the resulting technological spillover effects were produced through opportunities for discussions and communication among farmers. One of the factors that contributed to great technological spillover effects was this type of approach in which core farmers provide opportunities to promote communication between them and conventional farmers.

Fig. 4: Dissemination of Knowledge and Information among Villages/Communities (Number of Respondents Shown in Parentheses)



(Source: Beneficiary Survey)

To sum up, from the result of the terminal evaluation, we learned that the Project effectiveness was high since the utilization of transferred techniques was facilitated and the entire milk yield increased through the support for extension activities given by relevant associated organizations. At the time of the ex-post evaluation, moreover, it can safely be said that the Project led to positive results in terms of extension system development through ASOPLEA and the development and establishment of the transferred techniques even though there were some issues concerning extension worker training because the relationship between the executing agency and the relevant associated agencies was not maintained. Although several issues remain to be addressed regarding part of the results gained from the Project, its implementation allowed the Project objectives to be achieved, which proves that the Project was highly effective. Looking at the overall goal attainment, it was observed that ASOPLEA

maintained the proper extension system and technical support for livestock farmers who promoted or produced productivity improvement, which had great benefits for farmers, and technological spillover effects among farmers and villages/communities even though some project executing agencies and part of the associated organizations have not continued extension activities. From the above, effectiveness and impact of the project are high.

### 3.3 Efficiency (Rating ③)

#### 3.3.1 Inputs

The plan and actual performance concerning inputs for this Project are shown below.

	Plan	Actual Performance
Japanese Side		
Total Cost	350 million yen	283 million yen
Period of Cooperation	December 2004 to December 2008	December 2004 to December 2008
Experts Dispatched (Number of Experts)	Long-term experts : 3 Chief Advisor Project Coordinator/Training Experts in the Technical Extension Field (Livestock)  Short-term experts: 3 as required every year	Long-term experts : a total of 4 (on a 3-person basis) Chief Advisor Project Coordinator/Training Experts in the Technical Extension Field (Livestock)  Short-term Experts: 2 Investigation of Actual Conditions of Farm Economy Hygiene Control
Trainees Received (Number of Trainees)	3 every year	8 in total
Third-country Training Programs	Main fields of training: Unknown	In Panama (on Breeding Techniques) In Chile (on Production of dairy and beef cattle)
Cost of Machinery and Equipment to be Provided	20 million yen	13.38 million yen
Local Operation Cost	40 million yen	25.55 million yen
Others	N/A	N/A

Bolivian Counterpart		
Counterpart Personnel Distribution (Number of Persons)	CNMGB (General Manager, General Director, Technical Director, Technical Extension Experts)	CNMGB Staff: 13, Secretary: 1, Driver: 1
Land and Facilities	Necessary facilities to be provided	CNMGB Headquarters Office, Yapacaní Extension Office, UNAYA Agricultural and Stock-farming Experiment Station
Others	Project operation expenses to be borne	3.77 million yen (Actual performance up to December 2007)

### 3.3.1.1 Elements of Inputs

With respect to inputs provided from the Japanese side, the progress of the project was interrupted by a bottleneck in the first half of the project term. Because the relevant team leader and project coordinators were stationed at Santa Cruz about 100km from Yapacaní Municipality to direct the necessary operations, there was a lack of communication. In response to this, some improvements were made in the latter half of the project period; for example, by making sure that the project leader and project coordinators were stationed at Yapacaní Municipality to hold weekly meetings or make the necessary preparations. As another issue, the lack of competence in Spanish of the technical extension experts dispatched there in the first half of the project was pointed out; this problem was handled by having them accompanied by their interpreters. The project, as a result, yielded practical results with the inputs appropriately transformed into expected outputs through the above-mentioned improvements or countermeasures.

It is assumed that the resulting desirable outputs and the achieved project objective were derived from several factors; main factors were that cooperation with associated organizations secured the adequate number of extension workers, and unified training content made it possible to perform extension activities targeted for a wider area. Another factor which enhanced the project effectiveness was that cooperation with multiple organizations including universities and NGOs instead of depending only on the executing agency minimized the negative impact caused by the frequent dismissal and new hiring of government employees in Bolivia. The organizations susceptible to political effects (e.g., FSCPAPIY and HAMY) still repeated the dismissal and hiring of extension workers, while in other organizations extension worker changes were few. Even during such continuous extension worker dismissal and hiring by the above organizations, the project activities could be maintained with the extension activities taken over and continued by other extension workers dispatched from other organizations.

The key issue of this Project was how to train extension workers of associated organizations and provide necessary technique to farmers. As there was a big difference in the level of extension workers' techniques at first<sup>19</sup>, efforts to train the workers started from standardizing basic knowledge about breeding management to be organized into manuals and providing training using the manuals. As for creating technical manuals and training extension workers, eventually, these activities realized the desired results, utilizing techniques transferred and accumulated in various JICA projects for 10 years or more before the project was launched, on account of 2 major factors. One was that the executing agency already had specialists with the ability to handle professional livestock techniques, and the other was that Japanese experts with a great deal of knowledge of livestock techniques and technical extension worked together in effective ways.

Next, in training in Bolivia, third-country training programs, and providing practical techniques to Model Farmers in technical instruction, the experts and their counterparts advanced the technical levels of extension workers by making use of various methods such as seminars and fieldwork called *tDia de campo*<sup>20</sup>." Added to this, the experts and counterparts offered consultations through regular visits to solve problems from which farmers suffered. If the problems were not able to be solved, they were left and dealt with later by seeking advice from specialists of the executing agency or Japanese experts and by discussing such problems as the subjects for upcoming seminars or fieldwork to feed the necessary information or solutions back to the farmers. Through this, the approaches were effective in providing extremely systematic and practical extension worker training while ensuring that the executing agency and Japanese experts laid out the framework to give technical backup to extension workers.

The third-country training program in Panama conducted after a wide range of techniques in different categories was acquired through the training in Bolivia; how each technique influenced the entire breeding method was disclosed, fully observing the livestock farming situation of Panama after the introduction and utilization of extended technique. In addition, higher-level techniques, for example, disease prevention for cattle (by making observations of pictures for case studies and symptoms of sick cattle and learning how to take steps to prevent diseases) or prophylactic drug management and application, were also explained. As discussed above, the main driving force for achieving an effective outcome in the project is considered to be the improvements of the extension workers by using a skillful combination of the input of the executing agency and Japanese experts with a high level of technique, training in Bolivia, and third-country training programs.

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<sup>19</sup>In the areas targeted in this project, technical support has been provided to livestock farmers by each local stockbreeder's association or NGO on its own. However, the technical levels of extension workers are low and technical guidance was not sufficient; as a result, the contents of the training lacked coherence.

<sup>20</sup> After picking up a subject in each seminar and training extension workers through lectures and discussions while utilizing pictures for case studies and manuals, fieldwork called "*Dia de Campo*" is conducted. The fieldwork was useful in that the knowledge and technique regarding the subject studied in the seminar deepened and improved, discussing the subject in demonstration farm fields and exchanging ideas.

The function of UNAYA Agricultural and Stock-farming Experiment Station was reinforced through the construction of cattle isolation facilities and other support facilities using grass roots grant aid. It operated as a demonstration farm field and was used for giving technical support to Modes Farmer Groups and GTT to help promote project activities.

#### 3.3.1.2 Project Cost

The project cost was lower than planned.

#### 3.3.1.3 Period of Cooperation

The cooperation period was as originally planned.

In light of the above, the project had some issues to be addressed regarding the dispatch of Japanese experts. However, the relevant improvements were shown during the project period. The inputs were appropriate for producing outputs and achieving the project objective, and both project cost and period of cooperation were as planned. Therefore, efficiency of the project is high.

### 3.4 Sustainability (Rating ①)

#### 3.4.1 Policy System

In 2011, Bolivia stipulated “production improvement in rural communities” in Article 144 in its new constitution, in which the establishment of the system to promote the agricultural and livestock industries is specified. The preparation to enforce this constitution was started by MDRAyMA and Instituto Nacional de Innovación Agroforestal (INIAF)<sup>21</sup>, based on the technical extension support system developed in the project through mutual coordination among organizations; their policy concerning the concrete extension activities to be performed in close liaison with CNMGB, however, has not been set yet. This is almost wholly ascribable to the fact that CNMGB is essentially an institution for research and education in the field of livestock and dairy farming, not an organization that aims to promote technical extension. Given the above situation, INIAF’s role as the public extension agency under the constitutional mandate is increasingly important to facilitate technology transfer and other related activities in collaboration with CNMGB and other organizations.

#### 3.4.2 Counterpart Organizational Systems/Structures

From the end of the project through May 2009, CNMGB had maintained the system to provide

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<sup>21</sup> INIAF was founded in June 2008, with its organizational goal of (1) maintaining food security in Bolivia and increasing major agricultural product yields through technical development and extension and (2) improving the quality and quantity of agricultural products in the domestic market.

technical support to both training for farmers conducted by HAMY and ASOPLEA and training for GTT given by UNAYA. After personnel changes were made in the administration of UAGRM as a result of the election held in 2009, and the dean of the Department of Veterinary Science at UAGRM was installed as president, CNMGB became an agency subordinate to this Department. Against this backdrop, regulations to position extension activities as the official activities of the executing agency were not approved, which made it impossible for UAGRM and its Department of Veterinary Science to continue extension activities. However, recently it has been expected that the activities would be restarted because the university president during the project period was reappointed in the election in June 2012.

The personnel and organizational systems/structures of CNMGB are as shown below. It should be noted that some functions (e.g., the function of developing techniques depending on the needs of small-scale livestock farmers) have not been maintained.

Table 6: Personnel and Organizational Systems/Structures of CNMGB

Title/Department	Number of Persons	Role
Director of CNMGB	1	Controlling all the departments
Reproductive Technology Department	1	Collecting sperm of cattle, etc.
Technical Extension Department	3	Providing guidance on artificial insemination techniques, etc.
Breed Improvement Department	1	Artificial insemination and promoting mating behavior
Production Department	3	Producing meat and milk

(Source : CNMGB)

As this project was designed to establish proper technical extension models in its target areas, it was expected that CNMGB, the project implementing agency, would carry out extension activities with the models developed in this project in the Yapacaní region in the Santa Cruz Department after the project. However, it stopped its extension activities after the project and no such activity is conducted in the same region now. For this reason, sustainability in terms of systems to maintain and extend technical spillover effects from this project was unlikely, at least at the time of the ex-post evaluation.

### 3.4.3 Technical Aspects of the Implementing Agency

Since June 2009, CNMGB has not conducted any extension activities, and along with this, UAGRM has allocated no budget for extension activities to CNMGB. Consequently, CNMGB has failed to gain an understanding of the actual state of livestock farmers, respond to technical needs, and hold extension committee meetings since the end of the project. According to CNMGB's account, this situation was caused by two factors: (1) commitments agreed to be observed during the

terms of persons in charge of technical extension were not properly taken over by the next relevant responsible persons because of frequent changes of members involved in the project, and (2) most of the members are not able to participate in extension activities because executives of each project implementing agency have to deal with a lot of their own operational management work, or if proxies are appointed to act for the original project members, they are indifferent to the relevant activities and work on the activities as if they were nothing to do with them. Moreover, we can see another cause for this situation in that there has been no agency taking the initiative in leading the extension activities after CNMGB gave up the continuation of the activities. At present, the result is that technical sustainability in the case of CNMGB as the implementing agency would not be sufficiently secured because it has not continued with the activities.

#### 3.4.4 Financial Aspects of the Implementing Agency

CNMGB has not received any budget for continuing the project implementation because UAGRM as its superior organization abolished the policy to continue extension activities, whereas ASOPLEA, an associated organization, has continued its extension activities. ASOPLEA has allocated funds of 269 thousand boliviano (about 2.98 million yen) to extension activities based on its revenue sources including the sales of milk, veterinary medicines, and livestock feed, and union dues.

Table 7: Annual Budget of ASOPLEA (in Fiscal 2012)

Budget Item	Budget Amount (Unit : Boliviano)
Administrative Costs	14,700
Labor Costs	1,700,000
Technical Extension Activity Costs	269,000
Communication Expenses	45,000
Facility Maintenance Costs	21,000
Gas and Water Bill	350,000
Others (Reserves, etc.)	660,300
Total	3,060,000

(Source: ASOPLEA)

Yapacaní Municipality had budgeted for extension activities from 2008 to 2010 to provide training to a total of about 150 livestock farmers in 6 regions in the northern part of Yapacaní without the opportunity to receive technical extension training during the project implementation period. It conducted the training in teamwork with extension workers of ASOPLEA, using the extension manuals developed in the project. In and after 2011, however, extension activities have been suspended because of political matters in Yapacaní Municipality.



Table 8: Budget for Extension Activities in Yapacaní Municipality

Fiscal Year	Budget for Extension Activities (Unit : Boliviano)
2008	120,000
2009	80,000
2010	Unknown

(Source: HAMY)

Although the Technical Committee<sup>22</sup> was formed for discussing the necessary budgetary measures concerning extension activities among associated organizations in this project, it is confirmed that the organizations in charge of the activities have not acquired and utilized funds for extension system maintenance. After the project, neither the Technical Committee nor the Extension Committee was held because CNMGB stopped its extension activities.

From the above, it can be said that the financial sustainability in the case of Yapacaní Municipality as an associated organization and CNMGB, the executing agency, will not be sufficiently guaranteed, while ASOPLEA has secured the budget for extension activities.

### 3.4.5 Continuity of Effectiveness/Impact

After the project, it was assumed that the overall goal could be attained by continuing extension activities with the Extension Committee, consisting of CNMGB and associated organizations, playing a central role in the activities as well as through mutual coordination among all the relevant organizations. However, this committee lost its function because the executing agency and part of associated organizations did not continue their extension activities. With this being the situation, the initially proposed policy to secure sustainability in terms of project effectiveness by maintaining and extending technical spillover effects through mutual cooperation among the organizations concerned even after the project has not been followed. Another factor, namely, that any extension policy was not instituted after INIAF was newly founded, also makes the realization of project effectiveness sustainability uncertain. However, in the future, it is expected that INIAF could increase persistence of the project effectiveness in clarifying role as well as policy in cooperation with each institution.

There are 7 extension workers who still continue their extension activities for livestock farmers out of 11 workers trained in the project in total. ASOPLEA now has 5 extension workers; 2 workers at HAMY joined 3 workers already belonging to this association. The reason why it was able to continue its extension activities was that the project goal was consistent with the business purposes of ASOPLEA and the activities were effective as services to association members because milk

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<sup>22</sup> The members of the Technical Committee were the same as those of the Extension Committee with one representative selected from each of the executing agency and associated organizations, respectively. This committee had the function of building consensus among all the associated organizations after the representatives selected from each associated organization discussed the necessary subjects in the Extension Committee and fed back the results gained through the discussion to each associated organization. It was the theory of the committee that the two committees had different names – that is, one for discussing technical extension and another for the budget, etc., even though the two committees have exactly the same members.

production became commercially viable. The number of extension workers who still continue the activities other than the ones in ASOPLEA is 2 at UNAYA. They still belong to UAGRM, providing technical support to Model Farmer Groups and GTT through lectures to students or by using the demonstration farm field of UNAYA. In UNAYA, training fees were collected from participants, thereby facilitating continuous extension activities. As for 6 extension workers at AGAYAP and FSCPAPIY, on the other hand, no actual performance concerning their extension activities was reported. Since these organizations do not conduct the activities as a business, they cannot secure funds necessary for continuing the activities.

Since 2009, the association members have been able to obtain agricultural financing at the rate of about 10% per annum from Banco de Desarrollo Productiva (BDP) with ASOPLEA as a guarantee agency<sup>23</sup>. This enables the members in the targeted area in this project to make efficient use of bank financing to introduce milking machines and upgrade facilities, which promotes the implementation of transferred techniques. ASOPLEA also provides incentives to the member farmers to market high-quality milk by rating milk according to quality and graduating the prices to buy up milk. For maintaining the technique and extension system implemented in the project, moreover, it sets the technical support department within its organization to establish a system to give technical support to both the member and non-member farmers and to provide consultation for them. From this aspect, it is likely that ASOPLEA member farmers in particular, would continue to further utilize the project results.

Given the above, the continuity of the project results will be able to be maintained at a high level with the help of the high levels of performance of the relevant associated organizations in the areas targeted in the project. However, the sustainability of the initially assumed project effects that the Extension Committee (consisting of CNMGB and the relevant associated organizations) takes the initiative in maintaining extension activities and extending necessary techniques in the Yapacaní region working hand-in-hand with relevant organizations has not been secured. Moreover, major problems have been observed in the policy background and structural, technical and financial aspects of the executing agency, Therefore, sustainability of the project effects is low.

The project could be more sustainable if it more focused on building institutional consensus on sustainability and make joint efforts to achieve sustainability from the outset. For the sustainability of technology transfer, it also needed a clear strategy to strengthen the technical support system between INIAF and other institutions.

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<sup>23</sup> As support generated by this project produced good results, and then the self-help efforts of ASOPLEA bore fruit, a business service from which association members can obtain agricultural financing, with ASOPLEA as a guarantee agency, started.

## **4. Conclusion, Lessons Learned and Recommendations**

### **4.1 Conclusion**

This Project was promoted to produce adequate livestock technique improvements for small-scale livestock farming business in the area targeted in this Project to extend to small-scale livestock farmers the techniques transferred to and accumulated in the CNMGB as a result of Japan's cooperation to date. In so doing, the Project was implemented with the aims of establishing a technical extension model for ensuring that the farmers acquire the technique through technical extension workers' capacity improvement and extension system enhancement, and of increasing productivity by spreading the use of the techniques among the small-scale livestock farmers in the Yapacaní region in the Santa Cruz Department.

This Project was consistent with the National Development Policy of the Bolivian government, the needs of the Santa Cruz Department and the target areas where the Project was carried out, and Japan's ODA policy. Therefore, the relevance was high. The results aimed to be obtained at the end of the Project and the Project objectives were all realized. Moreover, in the ex-post evaluation, the Project was considered greatly beneficial to raw milk productivity improvement in the target areas, technical diffusion among farmers, and technological spillover effects spread among villages/communities, ensuring a high degree of effectiveness and significant impact at the level of the farmers. As far as inputs from the Japanese side are concerned, it was considered necessary to partly review and improve the dispatch of relevant Japanese experts; however, the strengthening of a technical extension support system in cooperation with 5 associated organizations allowed the specified results and the Project objectives to be achieved within the term of cooperation. In addition to this, the amount of cooperation funds fell within the planned budget; so the assumption can be made that the Project was very efficient. After the Project, 3 out of the 5 associated organizations suspended their extension activities, while the remaining 2 are still actively developing the activities with the Project results continually produced for farmers. However, the Project executing agency underwent a major change in system and their support for the extension activities has not been maintained. In ensuring the further development of the Yapacaní region through mutual coordination among the agencies, the sustainability of the Project effects can hardly be expected because there are still some challenges in terms of the sustainability of the relevant policy, structure, system, technologies, and finances. In light of the above, this project is evaluated to be satisfactory.

### **4.2 Recommendations**

#### **4.2.1 Recommendations to the Executing Agency**

Recommendations to MDRAyMA, INIAF, CNMGB, and UAGRM are as follows:

- It is recommended that INIAF strengthen the technical support system in collaboration with other institutions in order to enhance the sustainability of the project's effects.

- It is recommended that extension policies be reviewed by MDRAyMA and INIAF to define how to build a collaborative relationship with CNMGB. When setting CNMGB as an organization responsible for extension, it is also to be desired that they make efforts to resume the extension activities in teamwork with the Santa Cruz Department and by making necessary adjustments with UAGRM and the Department of Veterinary Science.
- In resuming extension activities, inter-organizational coordination is important. If CNMGB restarts them, it needs to go through the following steps: to approve the regulations for extension activities, to make positive efforts to hold regular “Comité de Extensión,” to make the necessary adjustments with local stockbreeders’ associations and associated organizations, to redevelop an extension support system, and to provide technical support to small-scale livestock farmers in collaboration with INIAF

#### 4.2.2 Recommendations to JICA

None in particular

#### 4.3 Lessons Learned

When launching a project in the field of agricultural and livestock-farming technique extension, the planner of the project needs to consider the following points:

- If the executing agency, like CNMGB, sets research and education as its organizational goal, there remain some issues on the establishment of a system or structure to extend relevant extension models to other regions and make the impact affect the regions in the agency and relevant organizations like UAGRM to which it is subordinate in this case. Especially in countries with no official extension support system developed, such as Bolivia, it is necessary to build proper extension models through mutual cooperation with other players, clarifying the roles and functions of authorities and the agency such as MDRAyMA and INIAF.
- Regarding extension models to be established in such countries as Bolivia with no official extension support system developed, it is important to consider that the executing agency with specialists having technical competence to train extension workers (e.g., research institutions, universities) is to be engaged in the establishment and extension together with producers’ associations or educational organizations that have extensive knowledge about region-by-region actual conditions and can offer their cooperation to the agency for the extension. If the relevant organizations have highly political missions (e.g., authorities, farmers’ pressure groups) or their organizational goals are not consistent with the project objective, however, we should be aware that they tend to be less willing to get involved in the project and the project effect sustainability cannot be sufficiently secured. As in the case of ASOPLEA, on the other hand, when the project objective is consistent with the organizational goals of the relevant organizations or the project

activities can support their businesses and service provision, there is the high possibility that they can cooperate with each other smoothly. Moreover, such a cooperative framework can be strengthened effectively if the extension methods developed in the project (e.g., method for extension through a demonstration farm field system, Model Farmers, and GTT farmers) are put to effective use.

In the selection of partners to work with, it is vital to enhance the effectiveness of support to give, with post-project effect sustainability taken into account, through examining the possibility that the partners can secure funds and their business models and by supporting the business environments providing them with technical support and capital investment in combination at the stage of project implementation.

### Column

To formulate and implement farming and livestock extension projects in a country like Bolivia where the public extension system is vulnerable, what issues are necessary is examined. 3 projects implemented in Bolivia – Mejoramiento de la Extensión Técnica para Pequeños Ganaderos (MEXPEGA), Difusión de Semillas de Arroz de Alta Calidad para Pequeños Productores (DISAPA), and Project for Development of Coffee Culture as Agricultural Alternative (CAFAMA) – were examined from the 3 perspectives, namely; (1) choice of techniques, (2) extension support system and (3) extension method. MEXPEGA aimed at increasing productivity by introducing various cattle-raising/breeding techniques. DISAPA tried to diffuse packaged rice varieties and cultivation techniques. CAFAMA attempted to improve the quality of coffee, targeting the international market.

As for (1) choice of techniques, the study results identify the following vitally important to choose appropriate techniques:

- ① To understand farmers' (technical and financial) capabilities
- ② To select the techniques suitable to the technical level of the farmer (MEXPEGA showed various techniques at its demonstration farms, showing both advantages and disadvantages of each technique and explaining in what farming environment each technique can be effective.)
- ③ To choose techniques through on-farm trial and evaluation by farmers (DISAPA conducted survey with farmers on growth and yield of newly introduced rice varieties and compared the results with conventional cultivation techniques. This helped increase the adoption ratio of new varieties by the farmers.)
- ④ To choose cost-effective techniques (In the case of MEXPEGA, a great number of farmers were able to increase their milk production because of their selection of cost-effectiveness techniques such as installing electric fence and paddocks.)
- ⑤ To choose techniques that meet local and natural conditions (CAFAMA carefully selected the techniques and varieties suitable to the target area's soil conditions, the climate and altitude in order to increase benefits to the farmers.)

As for (2), extension support system, it is very important to involve two types of organizations: an executing organization such as research institutes and universities with technical capabilities to train extension workers, and a local partner organization such as NGO and producers' association with good knowledge of local agriculture, and capable of technical extension in close collaboration with the executing organization. It is worth noting that it is sometimes risky to cooperate with organizations with strong political orientations and/or influence (e.g., public

administration and farmer's lobby groups) and when there is a wide gap between the organizational mission and the project's objectives. The partner organization's financial capacity to implement extension activities is another aspect that we should look at. In sum, the following points should be considered in selecting partner organizations:

- ① The missions and characteristics of the organization (to whom it aims to serve, whether it is interested in the tasks assigned by the project and to what extent the organizational mission meets the project purpose)
- ② The management capabilities of the organization (whether it can manage fund properly and it has a sufficient financial and human resources to implement extension activities)

When the above points are satisfied, the following issues should be further considered to ensure the sustainability of their extension activities:

- ① To discuss ways on how the project can be useful to develop the business model of the partner organization. In the case of MEXPEGA, milk producers' association established a technical assistance unit and it introduced the technology and dissemination system learned from the project. Dissemination activities of the association are still maintained as a part of the technical services to its members.
- ② To discuss the possibility of supporting both technical assistance and facility investment. In the case of MEXPEGA, with the facility investment and technical assistance combined, milk processing capacity of the milk producers' association has drastically increased to the extent that it can provide stable supply of milk to a large dairy company.
- ③ To discuss To discuss how to build the financial foundation and fund management capabilities. In the case of CAFAMA, the partner NGO actively sought funding from donors and successfully won support from the EU.

As for (3), the promotion of farmer-to-farmer extension, it has been found that it is important to develop key farmers and effectively use the media. For the development of key farmers, the following points are important:

- ① To develop a mechanism where both the key farmer and ordinary farmers can receive economic benefits. In the case of CAFAMA, key farmers received economic benefits by providing seedling, technical services and transportation services to ordinary farmers. By return, the ordinary farmers received technical assistance from the key farmer and had access to high quality seedlings. To date, the producers' cooperative has been developed

enough to launch collective shipping of coffee from its members targeting the European market.

- ② To select the key farmers who can influence ordinary farmers as an opinion leader. Forward-looking, risk-taking spirit is another important quality as a key farmer.
- ③ To study how the local farmers' networks are formed in order to identify effective extension and technical diffusion channels,

Another interesting finding was that the use of the media is very effective when it is used with the development of farmer-to-farmer extension systems through site visits and technical exchange. In the case of CAFAMA, the project held such events as "coffee sommelier competition", advertising through newspaper, radio and television. The ordinary farmers who learned about the new techniques began to approach the key farmers to seek assistance.

Thus, it is expected that the effects of JICA's technical cooperation in the fields of agriculture and livestock development would be further enhanced by planning and implementing projects, taking the above mentioned points, regarding choice of techniques, extension support system and extension method, into account.