

**National Directorate for Industrial Crops & Agribusiness,
Ministry of Agriculture & Fisheries,
The Democratic Republic of Timor-Leste**

**THE STUDY
ON
PROJECT FOR PROMOTION OF AGRIBUSINESS
IN TIMOR-LESTE**

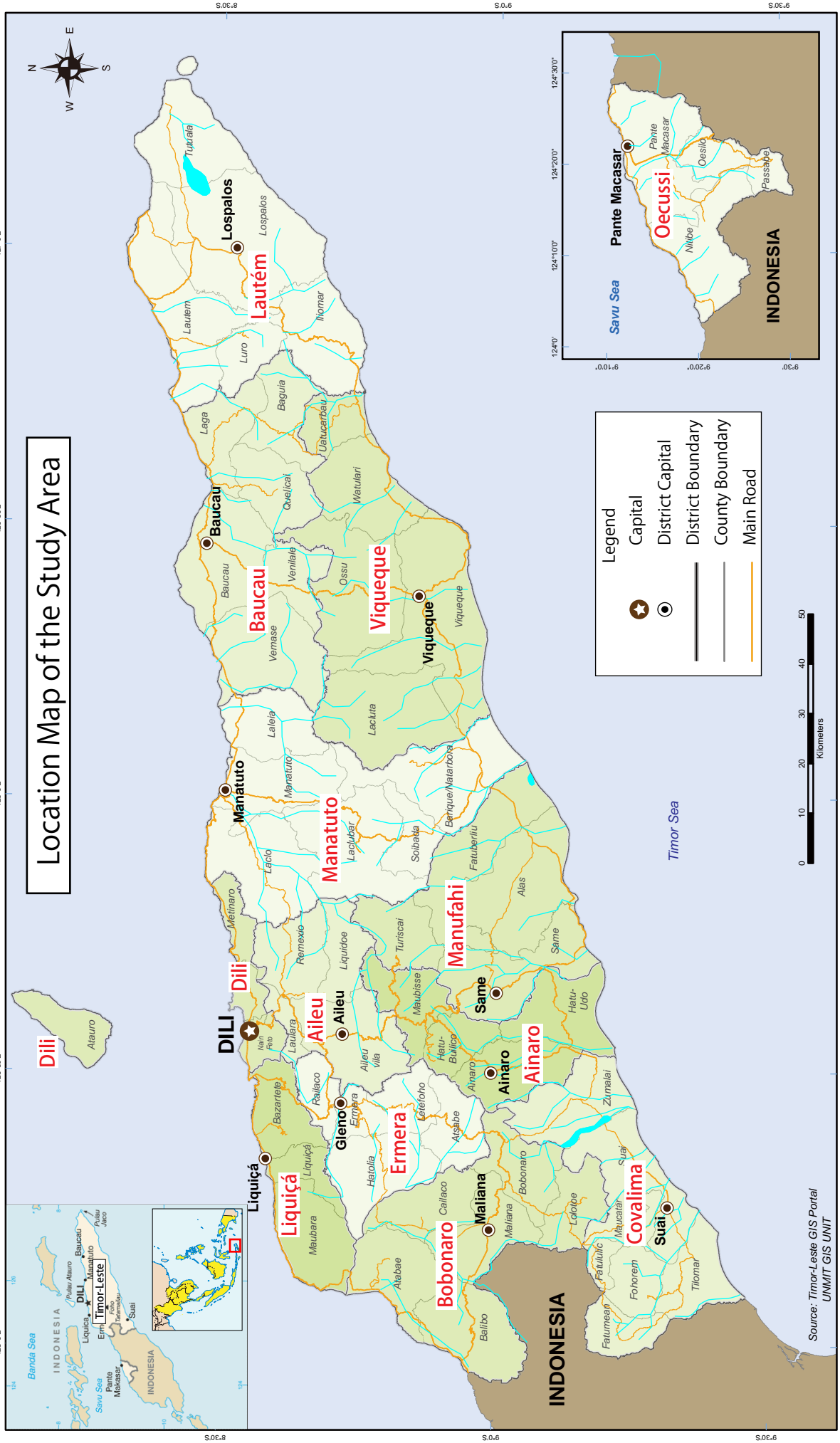
**FINAL REPORT
(PILOT PROJECT)**

NOVEMBER 2011

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

SANYU CONSULTANTS INC.

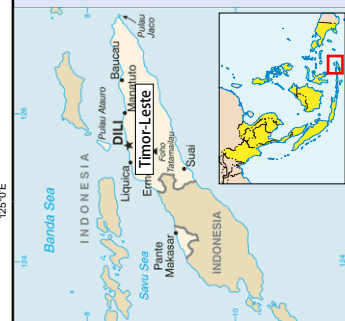
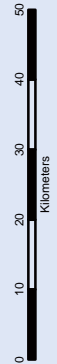
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Location Map of the Study Area

Legend

- Capital (Star in circle)
- District Capital (Circle)
- District Boundary (Dashed line)
- County Boundary (Dotted line)
- Main Road (Thick orange line)



Source: Timor-Leste GIS Portal
UNMIT GIS UNIT

EXECUTIVE SUMMARY

1. SELECTION OF PILOT PLOJECTS

1.1 OBJECTIVES OF THE PILOT PROJECTS AND PLANNING FOR SELECTION OF THE PILOT PROJECTS

(1) Objectives of the Pilot Projects

- 1) Agribusiness model with specified products/ commodities proposed in the draft master plan and draft action plan and,
- 2) Effectiveness of proposed draft master plan and action plan for promotion of agribusiness.

(2) Planning for Selection of the Pilot Projects

Selection process of pilot projects is planned as follows: 1) Pilot project candidates are picked, 2) Pilot project candidates are screened with the selection criteria, 3) .Pilot projects are selected.

1.2 SELECTION OF PILOT PROJECT CANDIDATES

Based on the selection criteria related with action group and target product, nine (9) projects were picked as the pilot project candidates as follows.

No	Pilot project candidates	Action group	Target product
1	Capacity Development of Agricultural Cooperatives	Rice cooperative Foliage cooperative	Rice, vegetable Foliage plant
2	Value Chain Improvement for Soybean Products	Tofu processing industry Soybean produce farmer groups	Soybean (tofu, soymilk, tempe)
3	Production, Processing and marketing of Natural Farming Products	Natural farming farmers	Natural farming vegetable and fruits
4	Improvement on Logistic Support of Fishery Products	Fish traders	Fishery products (fresh fish)
5	Promotion of Small Scale Business of Poultry Production by Women's Group	Chicken raising women groups	Livestock products (chicken and egg)
6	Diversification of Corn Product	Corn flour processor Bread making industry	Corn
7	Support on 'Local Product, Local Consumption' - Cooking Class -	Women groups	Root crops (cassava, potato, taro and corn, etc), corn and other crops.
8	Specialization of Local Products	Palm wine processor Honey collecting farmers	Palm wine Honey
9	Improving Export Quality of Candle Nuts Products	Candlenut producing farmers	Industrial crop (candlenut)

1.3 SELECTION OF PILOT PROJECTS

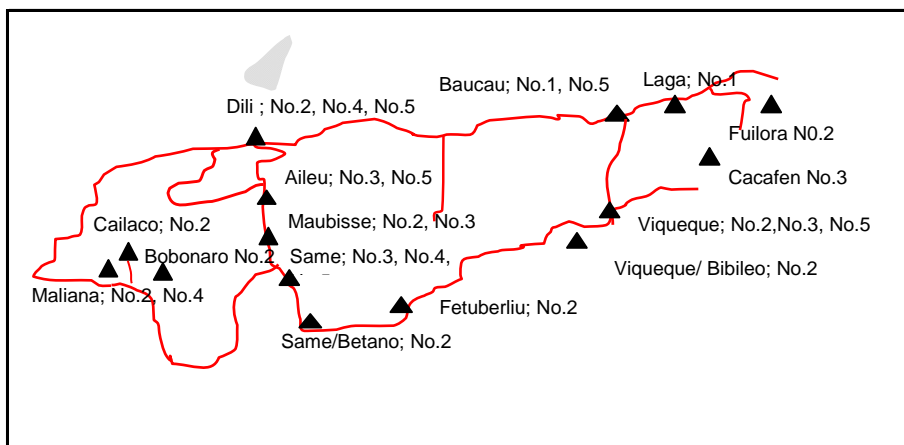
Selection criteria to rate the implementation priority was set to narrow the 9 candidates to several numbers with suitable scale.

Basic Concept	Rating Items
A. Impact on improvement of processing and marketing industry system.	A-1. Does the pilot project contribute to national food security policy?
	A-2. Does the consumer target put on the public?
B. Expected to be pilot.	B-1. Does the pilot project implementation contribute to capacity development of farmers/processors/ traders?
	B-2. Does the pilot project implementation cause a great extension effect on agribusiness field?

	B-3. Does the pilot project try to practice any useful pilot activities so that DNPIAC has not experienced in the past?
C. Expected to be general social and economic feasibility.	C-1. Are beneficial people expected to be large extent so that implementation effect can be easily extended to others?
	C-2. Is the pilot project likely to be feasible in cost and benefit analysis?

As the rating results, the following 5 pilot projects were selected.

Pilot projects are implemented in 13 sub-districts of 8 districts.



- No.1: Capacity Development of Agricultural Cooperatives
- No.2: Value Chain Improvement of Soybean
- No.3: Promotion of Small Scale Business of Poultry Production by Women’s Group
- No.4: Diversification of Corn Product
- No.5: Support on ‘Local Product, Local Consumption’ - Cooking Classes -

1.4 BASIC OPEARTION PLAN OF THE PILOT PROJECTS

Pilot project implementation organization is established by DNPIAC who is the implementation body and technical supporting groups who assist the action groups. It may be required for related MAF Directorates and Ministries to participate in the pilot projects. The Pilot Projects are evaluated from the view points of the five evaluative items; Validity, Effectiveness, Efficiency, Impact and Sustainability. Also, those evaluation results are graded into five levels shown from 5 to 1 score. Effectiveness of the Draft Master Plan and Draft Action Plans is verified through implementation of the pilot projects.

2. CAPACITY DEVELOPMENT OF AGRICULTURAL COOPERATIVES

2.1 IMPLEMENTATION PLAN

(1) Objective

This Pilot Project aims to verify promotion processes how rice and vegetable which are produced by the existing agricultural cooperatives are well processed and distributed to local markets under their own initiative management, through strengthening their cropping and business operation capacity.

(2) Action Plan

The main activities taken in the project implementation process consist of the followings.

- Action-1: Rehabilitation of the irrigation system
- Action-2: Improvement of cropping and marketing technology
- Action-3: Technical training for operation and management of the Cooperative

These actions are implemented independently. The Implementation organization is established by each

action. The pilot project activities are implemented, monitored and evaluated by each action.

2.2 REHABILITATION OF THE IRRIGATION SYSTEM

(1) Activity and Implementation Organization

This activity is to rehabilitate the existing irrigation facilities in order to strengthen the present production infrastructure of cooperative's cultivation fields. Operation and maintenance organization of the rehabilitated pump facility should be established in the cooperative. Implementation Organization was established as follows.

Implementing body	: DNPIAC, Baucau district agricultural office
Technical assistance	: Well digging company: well excavation, installation of pumps Baucau district agricultural office (Irrigation & water use management)
Related organization	: DNAH, DNIGUA, Cooperative Department of MED
Target group	: Salgueiros Cooperative (25 members)

(2) Final Evaluation

1) Implementation Organization in the Activity Process

Rehabilitation activities were guided by the study team, in cooperation with district DNPIAC. District DNPIAC staff participated in the implementation process from the beginning stage of the rehabilitation works. Through such participation, the district staff could learn the rehabilitation process how to proceed from survey to planning and designing. District DNIGUA staff has participated in the beginning stage such as site survey for planning, but, not participated in the next discussions and workshops with the cooperative for planning and designing. In the workshops for future operation and maintenance of the pumps and bearing its operation cost, District DNPIAC emphasized that support of pump driving fuel from the government did not been expected, therefore, cooperative should bear the fuel expenses. Such workshops were repeated. District extension workers did not participate in cropping vegetable with pump irrigation.

2) Final evaluation

Items	Final evaluation
Validity (Score: 4)	This action contributes to not only wet season paddy cropping but also dry season vegetable cropping. The action aiming to rehabilitate the devastated facilities is consistent with the needs of cooperative. And it helps the cooperative to strengthen cooperative's business operation/ management capacity. Scale of this action is very small. But, the rehabilitation works in this area surely contribute to the nation's Food Security Policy. Validity of this action is considered to be high.
Effectiveness (Score: 3)	Small farm (0.3 ha) was provided near the pump station so that it can be irrigated by the pump. Vegetable crops such as morning glory, tomato, water melon and long bean, etc. were planted in the plot. They got the benefits although pump fuel expenses were shared among the group members. For wet season paddy, rehabilitated pumps were used as supplemental irrigation water supply. Based on the performances through wet and dry season cropping, it could be judged that effectiveness of the rehabilitation of the irrigation facility was verified.
Efficiency (Score: 3)	Type of the pump installed in the Indonesian era was the submerged one. In this project activity, separated type of suction pump and diesel engine was installed since it is easy to operate and maintain. This pump type decision was made based on the discussion with the

Items	Final evaluation
	cooperative. The cooperative is now operating the installed pump engine. B/C is estimated at 1.2.
Impact (Score: 3)	In Timor-Leste, rain-fed paddy field like the targeted area is distributed widely. The farm plot is generally in the slope land. If yield of the paddy and vegetable would be increased through using the constructed pump, the construction work might have an effect on around farmers/ women group and cooperative members. The groups cultivated the dry season vegetables and shipped them to the Baucau market. They could benefit from the cultivation although they bore pump fuel expense. Judging from the dry season performance by the groups, it is considered that it may impact on the cooperative's future activity. This rehabilitation cause large impact on dry season's vegetable cropping.
Sustainability (Score: 2)	Discussion workshops with the cooperative were held to discuss above sharing consumed fuel expenses among pump users. As the discussion results, the cooperative allocated a pump operator and the fuel expenses are shared among pump users. It would be possible to sustain the O/M expenses. It may show they will be able to collect the O/M fee for future coming repair and exchange of spare parts in addition to the fuel expenses. It is necessary that district DNPIAC should monitor the cooperative's operation and maintenance activities for long term to judge properly the sustainability.
Total Score: 15	

2.3 IMPROVEMENT OF CROPPING AND MARETING THECHNOLOGY

(1) Activity and Implementation Organization

In order to improve the present skills/ technologies so that the cooperative members can sell them as value added ones, those actions are taken; 1) technical training for improvement of vegetable cropping, 2) creating additional value of rice by introducing rice grading system and conduct of technical training to cope with it, 3) technical training for market improvement of produced rice.

Implementing body	: DNPIAC, Baucau district agricultural office
Technical assistance	: CDC (Centro do Desenvolvimento Comunitario, NGO): Cropping, Post-harvesting, Marketing, Agricultural extension staff (Baucau district agricultural office)
Related organization	: DNAH, DNIGUA, Baucau district agricultural office
Target group	: Salguiros Cooperative (25 members), Related farmers groups

(2) Final Evaluation

1) Implementation organization in the activity process

DNPIAC directly assisted the activities by: (i) advising in the meetings and the workshops, (ii) informing the director of sub-district office and the suco chief about this pilot project activity, (iii) monitoring the activities. Agricultural extension staff provided useful farming skills in the cropping trainings in collaboration with the CDC.

In this Pilot Project, the relationship between the cooperative and CDC was not going well. The reason of the difficulty is considered that they did not communicate enough with each other. CDC has a good experience in organizing a farmers' cooperative. But in this Project, CDC had to start the training with the existing farmers' cooperative.

The cooperative “Salgueiros” is organized under the board of directors consisted of 13 members; a president, a vice-president, a secretary, a treasurer, 3 auditors and 6 directors. Main cooperative work is to cultivate paddy, mills them, packages rice and sells them to some dealers in Baucau and Dili. They produced 16 ton of rice (IR64) and sold them by \$1.0/kg to three supermarkets in Dili and five dealers in Baucau in last year. In this year, they plan to sell their produced rice (IR64, Nakroma) of 22 ton.

2) Final Evaluation

Items	Final Evaluation
Validity (Score: 4)	Rice farmers generally do not cultivate surplus rice exceeding their self-consumption. However, there is a big rice market in Dili, and other major towns like Baucau. If they can bring their surplus to those towns, they can sell them. They can sell their produce even in near marketplaces, but they have to pay the relative higher transportation and selling costs, since the scale of those town market is small. In addition, government products purchasing system is buying paddy without provision of quality standard. It seems to be weakened their own incentive to improve their cropping, post-harvesting and marketing activities. Under such conditions, the cooperative challenged to deal in vegetables in addition to the rice. This challenge is to make the cooperative’s agribusiness capacity strong. Validity of this activity is judged to be high.
Effectiveness (Score: 4)	The activity has demonstrated the effect of natural fertilizer and insecticide to boost their production. The importance of the post-harvesting was recognized well by the members. The problem to improve the quality is how to reduce the ratio of foreign matter and broken rice. As for the marketing, they identified current crucial problems 1) procurement of the plastic bags for packaging is still vague, and 2) arrangement of the transportation of their produced rice is difficult. It is considered that they learned positive marketing through this pilot activity. In this season, they plan to sell their rice to five supermarkets in Dili, adding the last targeted two supermarkets.
Efficiency (Score: 2)	As for the training of making natural fertilizer and pesticide, the members applied those learned skills to their fields indeed. They continue to use the installed silos properly. On the other hand, we could see the efficiency of the training of vegetables cultivation in their vegetable farm plot where vegetables cultivation was active. However, the efficiency was lower than the expectation since participates from the cooperative were a few.
Impact (Score: 2)	If their cultivation and marketing skills are improved, the sales volume will be increased, which will lead to a business model of agricultural cooperatives. An unintended negative consequence is that the activities caused bad relationship between active members and inactive members.
Sustainability (Score: 3)	Sustainability will depend on establishment of economically viable cooperative operations. The measures for increasing their sales were cleared, but the way to mobilize the members to the cooperative work is not found. Through the discussion of the members, it was confirmed that the members’ high concern matter who were not interested in the pilot’s activities was the "cash income". Therefore, setting a simple target in their cooperative activities which is able to increase their cash income is considered to be effective in encouraging their participation in the cooperative works.
Total Score: 15	

2.4 TECHNICAL TRAINING FOR STRENGTHENING OPERATION AND MANAGEMENT

(1) Activity Plan and Implementation Organization

Training programs provide any learning opportunities for cooperative members and other agribusiness stakeholders. Training is conducted as group training.

Implementing body	: DNPIAC, Baucau district agricultural office
Technical assistance	: Cooperativa Esperanca, NGO: Execution of training program, National Cooperative Department, MED: Introduction of cooperatives
Related organization	: DNPIAC, MED
Target group	: Salguiros Cooperative (8 persons), Related farmers groups, women groups, NGOs (11persons), DNPIAC staff (6 persons)

(2) Final Evaluation

1) Implementation organization in the activity process

MAF sent total 6 DNPIAC staff from Dili, Baucau (2), Lautem, Bobonaro and Oecussi to attend this training session. The training was conducted as the group training style. They sometimes served as resource persons. Cooperatives Directorate of MED provided an instructor for the training session. He conducted 2 lectures related to cooperative development and management. He provided an overview of cooperative activities in the agribusiness sector. The Cooperatives Directorate appears to have the skills, interest and resources to work together with MAF to build up the agricultural cooperative movement.

Cooperativa Esperanca (Esperanca) has experiences to participate in the donor projects including the Timor-Leste Government, USAID, and NGOs such as Belun, ETADep, USC (Canada) and Paz y Desarrollo (Spain). It was evaluated that Esperanca's management has proven itself technically competent, motivated and professional.

2) Final Evaluation

Items	Final Evaluation
Validity (Score: 4)	The cooperative is required to improve their management capacity. To do so, the cooperative is required to learn the lessons how to operate and manage their own organization through such agribusiness promotion. Participants were the persons from the Cooperative, MAF agribusiness staff and other related farmers group aiming to organize their group into cooperative. They learned the lessons how to promote agribusiness. Provision of training opportunity is consistent with the improvement needs of existing cooperative, farmers groups and DIPIAC staff. This also meets with requirement of Cooperative Directorate, MED. It is judged that validity of this training is high.
Effectiveness (Score: 4)	The overall development of the cooperative and agribusiness sectors is stated as long term target. To evaluate the effectiveness of this training activity, it will require at least 3 years. However, the trainees could have an immediate and positive impact. The cooperative and NGO participants can immediately begin to apply their skills in areas such as legal structures, and institutional organization.
Efficiency (Score: 3)	Total training cost was estimated at \$15,000. The cost per trainee/ day was calculated at \$50. This cost is very reasonable. Their business skills were improved in the fields of accounting, bookkeeping and formal registrations.
Impact	Besides the positive and intended impacts as described in "Effectiveness", unintended

Items	Final Evaluation
(Score: 3)	positive impacts include: (i) model for joint training implementation by MAF and Cooperatives Directorate, (ii) increased motivation by MAF staff to assist with cooperatives development, (iii) information exchange among MAF District, Agribusiness officers, and (iv) application of the skills in non cooperative endeavors. An unintended negative consequence was that it was difficult to show actual cooperative activities to the participants because well operated cooperative are still rare so that they could not get full understanding about the cooperative.
Sustainability (Score: 2)	As the results of promotion activity for organizing cooperative, a few cooperative such as savings and loan credit cooperatives, and the seaweed cooperative have done well, while most have languished. The participants now have the requisite skills. However, these skills will need to be consistent with the cooperatives' willingness to utilize their trained staff and apply their available resources. At the present time, the sustainability is judged to be low because the cooperative activity has not be prospective to established well.
Total Score: 16	

2.5 EVALUATION OF THE VERIFICATION THEMES

Through this pilot project, the following verification subjects 1) the method of administrative support by MAF in improving the operation from production to selling of cooperative's produced products, 2) the process of creating additional values in the stages of production, processing, marketing and selling for rice and vegetable, 3) the nurturing method of human resources of the existing agricultural cooperatives for strengthening their operating capacity, were evaluated.

3. VALUE-CHAIN IMPROVEMENT FOR SOYBEAN PRODUCTS

3.1 IMPLEMENTATION PLAN

(1) Objective

This project aims to improve value chain of the soybean products through making linkage between soybean producing farmers and soybean processors, and facilitating to develop soybean products using the produced soybean.

(2) Contents of the Project

This pilot project is consisted of two sub-projects on the difference in contents and target groups of each.

Sub-projects	Contents
1. Value Chain Improvement for Soybean Products (Wide Marketing Area)	Improvement of value chain in country wide marketing area. Soybean processor in Dili and Soybean producing farmers distributed in wide areas is the actors to make the linkage.
2. Value Chain Improvement for Soybean Products (Local Small Marketing Area)	Improvement of value chain in local small marketing area in Bobonaro district through strengthening cultivation technology of soybean producing farmers.

3.2 VALUE-CHAIN IMPROVEMENT FOR SOYBEAN PRODUCTS (Wide Marketing Area)

(1) Activities and Implementation Organization

Main Activities consist of "Conducting contract farming between soybean processors and soybean producers", "improvement of farming technology of soybean producers", and "Developing and promoting

new soybean product utilizing soybean procured by contract farming”. Implementation organization was organized as follows.

- Implementing body : DNPIAC
 Technical assistance : GVF (Green Village Food Ltd.) : contract farming, soybean agronomy, postharvest, processing & marketing
 District agricultural extension workers (Viqueque, Bobonaro)
 Related organization : MTCI, GIZ projects, IFC
 Target group : Soybean Producers: 3 groups (60 farmers): Bibileo village, Viqueque sub-district, Viqueque district, 1 group (40 farmers), Abat-oan village, Natabora sub-district, Manatuto district, 1 group (1 farmers' leader), Fatomaka village, Vilale sub-district, Baucau district, 4 groups (80 farmers), Fuiloro village, Lospalos sub-district, Lautem district
 Soybean Processors: 1 processor for soymilk, 1 processor for tempeh

(2) Final Evaluation

1) Implementation Organization in the Activity Process

Prior to proceeding to the contract farming, soybean seeds producing farmers are selected. To select farmers, necessary information was brought by central and district DNPIAC staff and related processors. Based on such information, the target farmers were found from the Maubisse area. Including the conduct of contract farming, DNPIAC staff participated in the negotiation with seed production framers and contract farming group as a mediator in information.

Viqueque district extension workers learned the ways how to make natural pesticide and how to spray into the crops. After the learning, the extension workers transferred this leaned skill into soybean producing farmers of the contract farming. However, the transfer activity was not repeated. It is required to repeat teaching until its technology could be fully put on farmers' technology in their fields.

2) Final Evaluation

Items	Final evaluation
Validity (Score: 4)	Bottleneck to improve the value-chain of local produced soybeans is to develop selling channel. In terms of promotion of "organic soybean" as a niche market, it is possible to linkage soybean farmers with soybean processors such as tofu, tempe and soymilk. Those value-chains would be formed in the domestic market only. Improvement of value chain may lead to expand soybean production through strengthening processing and marketing process in domestic level. The project aiming at making such value chain may contribute to national food security. It is evaluated that the project is validity.
Effectiveness (Score: 4)	The project aims to expand selling value-added soybean products through improvement of value chain. The present activities were put on improvement of soybean production to ensure provision of raw material to manufacture soybean products. As the results, the processor could manufacture organic soymilk. It was observed to establish the value-chain. To manufacture those products, introduction of sterilizing machine was essential. The processor is selling the organic soymilk to major supermarkets and retail shops in Dili. The effectiveness was judged to be high.
Efficiency (Score: 3)	There was affirmative result to apply technology such as selection of locally-fixed variety seed, wooden charcoal vinegar, perfectly-fermented compost using available micro-organisms and natural pesticide. These technologies are acceptable by leading farmers. And, it was observed that such technologies led to produce the positive effect in quantity and quality of soybean. Production activity may be prone to be affected in natural

Items	Final evaluation
	and land condition. It is necessary that cropping technology training should be repeated. Operation of the retort machine assists that soymilk was maintained by long-life more than 3 months without preservatives, which means the losses in processing and storing can be almost reduced. The benefit-cost (B/C) ratio is estimated at 1.1 under the targeted 1,000 bottles/day.
Impact (Score: 4)	The number of farmers groups of contract farming became was total 19 in the three districts. Key persons to support activities from production to post harvesting processing are the local trader, district extension workers, farmers group themselves, local NGO and District Agricultural Director. It is considered that there is an impact on micro economy of farmers groups and processors to build marketing linkage. During the project implementation, soybean production was affected by flooding and outbreak of pests. Dry soybean price has jumped. This price may affected in expansion of future soymilk marketing.
Sustainability (Score: 3)	It is the key subject of the value-chain improvement of soybean to strengthen the cultivating stage in the contract farming. To do so, it is indispensable that extension workers who are responsible for promotion of cultivating technology participate in soybean production activities. They have not enough organic farming technology and build capacity to promote soybean. Most of soybean farmers have conscious for technical improvement, since the improvement may increase production and create income generation. According to the cost benefit analysis, it is judged that soymilk business is sustainable.
Total Score: 18	

Prospect of the domestic soymilk market

Based on the current selling situations, market demands of the soymilk are expected to be more than 1,000 bottles per day in Dili. Considering the future demands in district towns, it is expected to be created at more than 3,000 bottles per day.

3.3 VALUE-CHAIN IMPROVEMENT OF SOYBEAN PRODUCTS (Local Small Marketing Area)

(1) Activities and Implementation Organization

Main activities were consisted of "Conducting contract farming between soybean processors and soybean producers", "Improvement of farming technology of soybean producers (applying organic farming method such as organic compost, organic fertilizer, and wooden charcoal vinegar)", and "Introduction and extension of tempe processing technology to women's producer group". Implementation organization was as follows.

- Implementing body : DNPIAC
- Technical assistance : OHM (Organisioun Haburas Moris, NGO): contract farming, soybean cultivation, post-harvest, marketing and tempe production
Bobonaro district agricultural office
- Related organization : Sub-district and suco agricultural extension workers
- Target group : Soybean Producing Farmers: 1 group (35 farmers) in Miligo, Cailaco sub-district, 3 groups (80 farmers) in Maleubu/ Tebabui/ Karabau, Bobonaro sub-district, Target Areas: 1st year 2ha, 2nd year 25ha

Tempe Producing Women's Groups: 1 group (22 women) in Atanbul, Maliana sub-district, 1 group (15 women) in Miligo, Cailaco sub-district

(2) Final Evaluation

1) Implementation Organization in the Activity Process

As for on-the-job training for improvement of cropping technology, related staff of district MAF office was called to participate in the training. However, there is few positive participated. Viqueque district extension worker was invited in the on-the-job training how to make and spray natural pesticide. After the training, the trained extension worker was transferred the learned skills to soybean producing farmers. Related district extension workers are encouraged to participate in the training.

Local NGO (Haburas Moris) facilitated well the project activity as the technical supporting group. The NGO worked with soybean producing farmers groups and processing groups. The NGO is trying to expand their business activities based on the cropping technology learnt from the training. For extension of farming technologies, farmers wish to watch successful cases, otherwise, farmers might not accept anything. When developing at new sites, it is the process essential for related farmers to start from small plots.

2) Final Evaluation

Items	Final evallutaion
Validity (Score: 4)	Soybean production can be effective to make nitrogen fixation in the cropped land. It is not easy for farmers to procure chemical fertilizer and pesticide. As for promotion of soybean production, developing natural farming method were practiced by making use of local natural resources. It is clarified that approach taken in this project meets with the farmers' needs to make soybean production stable. Introduced technology to multiply the tempe bacillus contributes to manufacturing and selling tempe by higher quality and cheaper price. Although improvement of value chain in this project is limited into small area, it is obvious that the project contributes to realization of food security. The validity is judged to be high.
Effectiveness (Score: 4)	Improvement of cropping technology is put on strengthening natural farming. Although the production area was damaged by flood, introduced cropping technology was effective since farmers participated in the training obtained skills and knowledge and could have a certain yield by applying in their fields and get had confidence in themselves. They learned the method about natural pesticide and organic compost. By observing training effect on the fields, they can get prospects for selling produced to soybean processor in Dili. Tempe has been manufactured by using imported tempe bacillus so far. By introducing a new skill to multiply the tempe bacillus, high quality tempe could be manufactured at cheaper cost. Validity of this project is considered to be high.
Efficiency (Score: 4)	Input materials can be collected easily from in/around the area and made at cheaper price. The technology is adaptable to the technical level of soybean producing farmers. Efficiency is judged to be high. As for the tempe, the skill to multiply tempe bacillus is also adaptable for processors and local women. Considering these performance so far, it is judged the efficiency is high. NGO learned in the training transferred the skill to the women group in Maubessi. The NGO can play as a facilitator for technology transfer of tempe manufacturing.
Impact	Contract farming was started from 35 farmers in Cailaco sub-district of Bobonaro district.

Items	Final evallutaion
(Score: 4)	After this, target farmers have expanded to 80 farmers of 25 ha in the five sucos. In the contract farming, selling target is decided in advance. Farmers groups can produce tempe. They can avoid the farming risk. It is judged that impact of contract farming is high for participated farmers. Two women groups in the two sub-districts of Cailaco and Maliana are manufacturing tempe. Tempe production in the past was 20 bags in a week. Present capacity comes to 200 bags in a week if soybean is fully stocked.
Sustainability (Score: 3)	In order to ensure sustainability of soybean production, it is necessary for extension workers to deepen and fix the organic farming technology. To do so, extension workers should act as key persons. NGO participated in this project served as a technical supporter between farmers group and processor. District office worked well as an interface between them. DNPIAC should act as supporter to ensure sustainability. To do so, their coordination capacity by making full use of local human resources should be strengthened. There is a constant demand of the tempe. It can be said that transferred tempe producing technology is the adaptable skill for local women groups. Sustainability is expected to be high.
Total Score: 19	

3.4 EVALUATION OF THE VERIFICATION THEME

Through this pilot project, the subjects related to 1) the possibility of the contract farming between soybean processors and domestic soybean producers or soybean traders, 2) the process of supporting soybean processing industries, were verified and evaluated.

4. PROMOTION OF SMALL SCALE BUSINESS OF POULTRY RAISING BY WOMEN'S GROUP

4.1 IMPLEMENTATION PLAN

(1) Objective

This pilot project aims to support small scale poultry business running by local women groups in order to increase supply of domestic chicken meat and egg from farm household level to local market, and verify effectiveness of domestic poultry business as the substitute for importing chicken meat and egg.

(2) Action Plan and Implementation Organization

Under the project, training on chicken breeding, marketing, and group management is conducted. The activity includes in improving henhouse, planning disease prevention measures. Promotion activity to sell domestic chicken and egg includes know-how of providing market information and making use of it. Those activities are practiced under this implementation organization.

Implementing body	:	DNPIAC
Technical assistance	:	Alola(Alola Foundation, NGO): chicken rearing, disease prevention, feed preparation, marketing of chicken and egg, business operation, etc. District DNPV staff: disease prevention, vaccination
Related organization	:	DNPV, DNAH
Target group	:	Women groups in rural area: Viqueque (Viqueque), Aileu (Aileuvila), Ainaro (Maubisse), Manufahi (Same), Total 53 persons. Lauten (Cacafen), 15 persons

4.2 PROJECT IMPLEMENTATION AND MONITORING

Main activity put on the improvement of chicken breeding technology. As for the disease prevention measures, traditional way by making use of medical plants and fermented feed with micro-organism materials were practiced. Local available crops were used as compound feed.

4.3 FINAL EVALUATION

(1) Implementation Organization

Raising works had been progressed in 1st year, although there are some differences related to the growing number of chickens at four sites. In the Aileu, all of the raising chicken has been dead because incorrect medical care was carried out by district DNPV staff. It means that veterinary services should be carried out by qualified and trained persons who have enough capacity and knowledge regarding chicken disease diagnosis, medical treatment and vaccination. Learning opportunities should be provided for them with launching poultry business project in nationwide.

As for overall operation, the NGO assigned as a supporting group in this project has performed as planned. For further development, the NGO is requested to find advanced cases and collaborate with them and experts, and to provide learning opportunities.

Since some action groups did not follow technical instruction guided by the study team and the technical supporters NGO. However, after raising chickens had been dead due to inflectional diseases in the first year time, they have seriously implemented disease prevention measures such as fermented feeds making and traditional medical treatment.

(2) Final Evaluation

Items	Final evaluation
Validity (Score: 4)	Chicken meat and egg are high quality protein foods, but most of them are imported. The Government emphasizes promotion of small scale livestock in the rural areas to improve nutrition intakes for rural people. The pilot project is the small scale. But, this pilot project aims to produce and sell local eggs in the local small market area. It is judged validity is high.
Effectiveness (Score: 3)	There are differences in numbers of produced chickens by sites. Two groups of Viqueque and Same are have already raised chickens and the number of their chicken produces is increased. They sold out their produced alive chickens and eggs. Supplies of these products to local markets are overwhelmingly insufficient against local demands. Since it is obvious to get profits from this activity even purchasing feeds, all groups are eager to extend their activities. To cope with price fluctuation of feed materials is the key factor to obtain profitability.
Efficiency (Score: 2)	Regarding raising methods, in-henhouse raising method was recommended, but, only one group was applied this method. Other groups release the chickens during daytime and take care in henhouse in nighttime. This semi-henhouse raising method is generally accepted by Timorese who are familiar with free animal raising style. Regarding the input equipment, incubators with solar power generation were introduced in the low temperature highland sites. However, it was observed that the some groups did not use them. It is an effective method to use traditional medical plants and fermented feeds which may be effective for chicken to have immunity. The B/C ratio ranges from 0.22 of Aileu to 1.3 of Viqueque.

Items	Final evaluation
Impact (Score: 3)	It is likely a realistic activity for rural women to deal in raising chicken and selling produced. The activity may bring large impact to them in generating income source. The pilot project sites are regarded to be the representative of each natural condition. Those sites are expected to be function as model sites of chicken raising. Chicken meat and egg are the one of important protein source for rural people. Small scale and dispersed poultry business might contribute food security in Timor.
Sustainability (Score: 3)	In order to ensure the sustainability of the project, establishment of chicken disease prevention system is the most important subject. It is indispensable to support from district DNPV in taking prevention measures. It is necessary to improve their capability on disease prevention, in order to establish the system. NGO should work as a facilitator until cooperative relationship between the women groups and district DNPV can not be established. Feed preparation as practiced in this pilot project is also the important subjects to ensure the sustainability.
Total Score: 15	

4.4 EVALUATION OF THE VERIFICATION THEME

Through this pilot project, verification themes 1) the feasibility of domestic chicken meat and egg promotion so as to become import substitution products, 2) the possibility of corn and other local products to utilize them as feed for chickens, 3) the effectiveness of providing market information supply service of domestic and imported chicken meat and egg, 4) the process of supporting poultry breeding business running by woman groups, were evaluated.

5. DIVERSIFICATION OF CORN PRODUCT

5.1 IMPLEMENTATION PLAN

(1) Objective

This pilot project aims to promote diversification of domestic corn. To do so, the project is designed to introduce domestic corn flour as a substitute for imported wheat flour to the bakeries/ processing groups, and manufacture any corn flour products such as bread and chips, expand its manufacturing method and support to sell them.

(2) Action Plan, Action Group and Implementation Organization

The action plan and implementation organization were planned as follows.

- Developing new domestic corn products and introducing to Dili market

New products using domestic corn flour are developed by a bakery in Dili. Sales promotion is sought through tasting them and its feasibility is analyzed.

- Introducing developed products to local markets and supporting its sales promotion

The activities aim to introduce the new products developed in Dili into local markets and support its market expansion.

Implementing body : DNPIAC

Technical assistance : CDEP (Centro do Desenvolvimento da Economia Popular, NGO): food processing, marketing of corn, milling, support of manufacturing/ sales promotion.

Related organization : DNAH
 Target group : Bakeries who are interested in corn bread in Dili, Same and Baucau

5.2 PROJECT IMPLEMENTATION AND MONITORING

Corn bread was developed as new corn products. Production cost per 1.0 kg flour was \$0.87, cheaper than the \$1.0 of wheat bread. Commercial possibility was judged to be high. After the development, sales expansion activities were conducted.

5.3 FINAL EVALUATION

(1) Implementation organization in the activity process

DNPIAC has taken an active role in concept development. It directly assisted the pilot activity by (i) recruiting participating bakeries in Dili, Same and Baucau, (ii) recruiting focus panel participants, (iii) serving on focus panel boards, and (iv) promoting products to other government agencies and at national exhibitions.

CDEP was active in the planning, implementation, marketing and monitoring of all phases of the implementation of this pilot project. It is recommended that CDEP be considered as an executing agency for similar future projects.

Padaria Samsan had several limitations. The bakery was better suited to marketing its own wheat products rather than the new developed corn product. Sales of the Delta Bakery in Dili are still continuing to grow by means of door to door delivering service early in the morning directly to the customers. As for pilot project bakeries in Same and Baucau, unfortunately over the period of the pilot, corn kernel prices nearly doubled. This large escalation in prices completely changed the profile of corn product businesses. Consequently, the bakery has stopped production of corn bread products.

The pilot project supported local bakery purchases corn flour from a miller in Maliana. Millers in local city are sometimes reluctant to make corn flour for bread making and accord priority to the higher paying “sasoro” customers.

(2) Final Evaluation

Items	Final evaluation
Validity (Score: 3)	The overall goal, project purpose and outputs of this project remain consistent with the Government’s development policies of economic development, employment promotion and import substitution. The pilot introduces new products made from locally produced corn, thereby boosting sales incomes and creating additional job opportunities for millers, bakeries and caterers. It also has the purpose to shift food demand away from imports to locally produced crops. Considering these situations, this pilot project’s intent remains valid.
Effectiveness (Score: 4)	The pilot project has the upstream impact of supporting millers’ production. Pasquela bakery continues very successfully with catering of corn products as do the women trained under the pilot “Local Products - Local Consumption”. Delta Bakery is making good progress marketing its corn bread. In May 2011 it was selling 250 pieces of corn bread per day, which is equivalent to 16% of total sales. Considering these situations, it is judged effectiveness is high.
Efficiency (Score: 3)	The quality and quantity of the inputs were acceptable. Machinery and equipment functioned well and milled corn flour quality was better than the expected. the small

Items	Final evaluation
	bakeries' corn milling machines were only partially used. All other inputs have been fully utilized. On a macro scale the pilot also proved itself quite efficient. Assuming nationwide 20 bakeries follow Delta's production and sales example, amount of wheat imports would be reduced by approximately 15 ton/ year. The B/C ratio is estimated 1.2.
Impact (Score: 3)	The pilot's positive and intended impacts are to increase sales income, provide additional jobs and reduce dependence on imported wheat flour. Unintended but modest positive impacts include (i) increased sales from corn millers, (ii) improved corn market for farmers, and (iii) development of new corn products. These positive impacts are expected to increase as the production of corn bread becomes more widespread. Increased demand for corn flour would boost Maliana millers sales and income. Also country maize production is expected to increase.
Sustainability (Score: 3)	Catering operations of corn products appear to be economically viable. The sustainability of catering operations selling corn confectionaries is highly likely. Profit margin depends on the specific product. However, in general, the markup for corn cakes and pastries is over 30%, making their sale a highly profitable business. Corn bread production also appears to be a sustainable business. The taste of wheat bread is typically preferred by consumers. Nevertheless, the pilot project has demonstrated that with proper market promotion corn bread can substitute for about 15% of wheat bread sales. Furthermore, it is analyzed that corn bread is more economical to produce than the wheat bread. Corn bread costs 13% less to make than the comparable wheat bread product.
Total Score: 16	

5.4 EVALUATION OF THE VERIFICATION THEMES

Through the pilot project implementation, the verification themes 1) potential of domestic corn flour as a substitute for imported wheat flour, 2) possibility of increased domestic consumption of corn flour based products, 3) using process of market information services for promotion of domestic and imported corn were verified and evaluated.

6. SUPPORT FOR 'LOCAL PRODUCT, LOCAL CONSUMPTION' – COOKING CLASSES –

6.1 IMPLEMENTATION PLAN

(1) Objective

The project aims to extend local consumption of domestic farm products such as corn, potato, and cassava, through disseminating the way of cooking using local farm products by introducing cooking classes in which rural women can learn it.

(2) Action Plan, Action Group and Implementation Organization

All sorts of recipes which use local farm products and seasonings available in local markets are devised to promote local consumption and local products. Cooking class is planned to introduce the recipes to rural people. The cooking class teaches effective aspects of nutrition and hygiene with the cooking.

- Implementing body : DNPIAC, District agricultural office in Baucau, Viqueque, Aileu and Ainaro
 Technical assistance : TE (Timor Endeavor, NGO): Lecture on hygiene/ nutrition, preparation of cooking recipe
 CV (Christian Vision, NGO) and ETDA(East Timor Development Agency, NGO): Opening cooking classes in Dili and local city

	Cooperativa Esperanca: Preparation of cooking book
Related organization	: DNPIAC, District agricultural office in Baucau, Viqueque, Aileu and Ainaro
Target group	: Participants in the cooking classes: total graduates 297 persons

6.2 PILOT PROJECT IMPLEMENTATION AND MONITORING

The following activities were taken and monitored:

- Operation for opening cooking classes: Developing recipes using local farm products, Making cooking book, Training cooking instructors, Monitoring the operation of cooking classes
- Opening the cooking class in Dili: Providing kitchen facilities/ equipment for opening the cooking class
Inviting participants in the cooking class
Opening the cooking class
- Opening the cooking class in Local: Providing kitchen place for cooking class, Inviting participants of cooking class
Opening the cooking class
- Support for cooking service business activities

6.3 FINAL EVALUATION

(1) Implementation Organization

DNPIAC actively supported the activity during both its conceptualization and design and implementation. They also suggested key district participants, instructors, from the local women's agribusiness groups. MAF officials from both national and district levels attended opening and closing class ceremonies. Their presentations covered messages about the importance of using local crops for both good nutrition and as value added sales items. DNPIAC utilized their own budget to have cooking class participants prepare class learned recipes for a national exhibition, UN's World Food Day. And during 2011 May Independence celebrations, DNPIAC organized an exhibition for sale of locally produced foods.

Timor Endeavors (TE) was the project management NGO. It oversaw documentation preparation, instructor training, pilot implementation and final survey and report preparation. Christian Vision (CV) was responsible for cooking class implementation in the 4 districts of Baucau, Same, Aileu and Viqueque. In total 223 participants were trained. ETDA operated the class in Dili. In total 74 participants were trained

(2) Final Evaluation

Items	Final evaluation
Validity (Score: 3)	Timor-Leste does not produce sufficient staple foods to meet its demand. To make up for the shortfall, it annually imports over 100,000 ton of staples. This pilot is designed to shift household food demand away from imports to locally produced crops, thus promoting import substitution and lowering foreign exchange losses. Cooking classes were generally oversubscribed indicating that the pilot was well directed at target groups needs.
Effectiveness (Score: 4)	The pilot's output is the 297 women trained. According to the interview survey with graduates, each graduate now cooks a class recipe at home at least twice a week. The interviews indicate that an estimated 25% of the new meals do replace imports (about 0.075kg/meal). Then, the annual increase in demand for local food crops is estimated at approximately 14 ton by total 297 graduates. Surveys also found that 85% of participants correctly understood the pilot's nutrition, health and safety information.
Efficiency (Score: 5)	The total input cost, which includes (i) personnel (management, technical, and implementation), (ii) machinery and equipment and (iii) food supplies, is estimated at

Items	Final evaluation
	\$66,000. One time start up costs for course material preparation, equipment and facilities improvement represents 70% of net cost. The remaining direct training costs are about \$19,750, equivalent to \$66.50/ participant. Per session per participant cost, which includes instructors, facilities, utilities and food, is \$8.31. the cooking classes appear to be a cost effective investment. If food materials are saved through import substitution, the B/C ratio is estimated 1.0.
Impact (Score: 3)	The pilot's positive and intended impact to increase consumption of local produce with related nutritional, infiltration of hygiene and safety concept. In addition, there are a range of unintended positive impacts (i) approximately 150 graduates occasionally gain extra income by catering events, (ii) increased awareness of government officials of the importance of women to boost locally produced food consumption, (iii) 13 trained instructors continue to teach the course content beyond pilot completion.
Sustainability (Score:4)	Both ETDA and Christian Vision will continue to offer cooking courses based on the recipes prepared by the pilot project. The cookbook produced under the pilot can continue to be used for new classes. The existing cookbook contains 36 recipes of which each class only requires 8 recipes. More classes, using the skills and information developed under the pilot, can be offered in existing areas. ETDA operates on a self sufficiency basis. However, CV operates mostly in small towns. Consequently they plan to maintain their low tuition levels. .
Total Score: 19	

6.4 EVALUATION OF THE VERIFICATION THEMES

Through the pilot project implementation, the following subjects were verified and evaluated 1) Potential to Increase Demand for Domestic Agriculture Products Through Extension of Local Product Based Recipes, 2) Possibility of Establishing Small-scale Culinary Businesses by Cooking Class Participants.

7. LESSONS LEARNED FROM THE PILOT PROJECT IMPLEMENTATION ORGANIZATION

Following lessons were also learned from the evaluation process of the implementation organization. Obtained lessons are put on the planning of implementation organization of the Action Plan.

7.1 NECESSITY OF STRENGTHENING DISEMMINATION SYSTEM OF CROPPING TECHNOLOGY

It is important for agribusiness actors to deal in produced crops in quantity and quality stably as raw materials for their processing/ trading activities. In order to establish value chain system and ensure procurement of raw materials, it is crucial to strengthen cropping technology including multiplication of its seed, aiming to make marketing of raw materials of target product stable.

7.2 NECESSITY OF CAPACITY DEVELOPMENT OF DNPIAC FOR COOPERATION WITH RELATED MINISTRIES AND MAF DIRECTORATES

Pilot projects were implemented in cooperation with related organizations. DNPIAC acted as the implementation body. DNPIAC practiced to make arrangements with related ministries and MAF related directorates. Through the cooperation works, DNPIAC's roles and functions were verified. As the result, it was not considered that cooperation was fully conducted. In order to realize cooperation among related organizations, it is required to train the DNPIAC staff so that they can work as implementation body.

Government products purchasing system affects an influence on the pilot project activity, especially private sector's economic activity in the value chain system. MAF should suggest improvement ideas based on such negative influence to MTCL.

7.3 NECESSITY OF TECHNICAL SUPPORT FROM RELEVANT PRIVATE ORGANIZATIONS AND GROUPS

In the pilot projects, NGOs and relevant private organizations/ groups were incorporated into the implementation organization as technical supporters. It was evaluated to be effective to make use of them, although their activities were properly managed under the technical and financial supports by the study team. NGO participated in the pilot project learned new technology/ skill and accumulated knowledge. Such NGOs will be able to act as a facilitator or learning center under an appropriate management and financial support, for future implementation of the Action Plan

8. CONCLUSION AND RECOMMENDATION

8.1 CONCLUSION

Five pilot projects were implemented based on the basic concept of value chain improvement considering contribution to development goal such as ensuring food security and shifting to market oriented agriculture. Pilot projects were evaluated based on the five evaluation items. As the results of the evaluation, business model of the project was judged to be effective, although the evaluation has different level.

8.2 RECOMMENDATION

(1) Suggestion to the Action Plan

Projects of the Draft Action Plan were verified through the pilot project implementation. As the result, the following lessons were learned. Those should be put on the finalization of the Action Plan. (Lessons learned from the project "Capacity Development Plan of Agribusiness Stakeholders" of the Draft Action Plan is put on the projects "Establishment of Product Based Value Chain" and "Capacity Development Plan of Value Chain Stakeholders" of the program "Value Chain Improvement" in the finalization of Action Pan.)

1) Lessons learned from the Pilot Project "Capacity Development of Agricultural Cooperatives"

Project	Lessons learned
Rehabilitation of Agricultural Production Infrastructures	Considering the topographic condition in Timor-Leste, rehabilitation of gravity irrigation system should be prioritized. But, it is unavoidable for farm lands where have no suitable streams in/ around that areas to introduce diesel engine pump with well. It is proposed to standardize the all stages from survey, planning and designing to construction works so as to make rehabilitation works smooth.
Strengthening of Dissemination System of Cropping Technology	In order to strengthen natural farming methods, inputs of organic fertilizer and organic pesticide are effective for improving crop growing.
Support for Set-up of Processing Industries by Farmers/Women's Groups	It is not easy for cooperative members to make consensus for organizing cooperative activity, especially, in case of new challenging activity with expenses. Long term period is required in order to strengthen the cooperative's capacity
Support for Improvement of Product Transportation	It is necessary for agribusiness targeted products to provide basic material and measures of packaging.

Project	Lessons learned
	It is necessary to collect information on transporters and supply to agribusiness stakeholders.
Introduction of Agriculture Produce Grading System	The introduction of required labeling of rice grade for all domestic rice sales would make rice market active, and benefit local farmers, traders, retailer and consumers.
Capacity Development Plan of Agribusiness Stakeholders	Group training participated from private groups and government was effective to build their capacity and make human resources network among private and government agribusiness persons.

2) Lessons learned Suggestion from the Pilot Project "Value Chain Improvement for Soybean Products"

Project	Lessons learned
Establishment of Seed/Input Materials Supply System	Seed is procured by agribusiness target crops, As for soybean seed, Maubisse produced seed can be distributed to production farmers.
Strengthening of Dissemination System of Cropping Technology	In order to strengthen natural farming methods, application of organic fertilizer and organic pesticide are effective for crop growing.
Promotion of Contract Farming	Contract farming should proceed flexibly taking into consideration the farmers' contract sense. Supporting activity aiming to improve cropping technology should be given to farmers groups, in order to make farm production stable.
Support for Set-up of Private Processing Industry	Financial support might be necessary for private sector in procurement of machine and/or equipment to make processing and marketing business easy.
Support for Set-up of Processing Industries by Farmers/Women's Groups	Tempe manufacturing skill is the women's group adapted technology by using local materials.
Support for Marketing Route Development	Sales promotion strategy should be provided from the viewpoints of consumers' five mental aspect, Attention, Interest, Desire, Action and Satisfaction.
Introduction of Agriculture Produce Grading System	The protein content of local soybeans at nearly 50% is a very favorable finding for soybean processors.
Capacity Development Plan of Agribusiness Stakeholders	It is an urgent matter for district extension workers to improve their cropping technology and promotion capacity. On the other hand, it can be possible to make use of NGOs who learned know-how in the pilot project for promotion of the cropping technology.

3) Lessons learned Suggestion from the Pilot Project "Promotion of Small Scale Business of Poultry Raising by Women's Group"

Project	Lessons learned
Support for Set-up of Processing Industries by Farmers/Women's Groups	Chicken raising activity may be accessible for women's groups in local area. since they can set up with low capital investment. It is hard to expand the raising activity because of unexpected disease occurrence risk. Considering such risk, it is realistic for women groups to put chicken growing business rather than chicken egg business, through strengthening traditional raising method by using local feed materials.
Support for Provision of Processing Infrastructures	The power source of the processing machinery and equipment was designed based on operation and maintenance method including bearing the running cost.
Provision of Agribusiness Information and Communication System	In case of small scale sales chicken business by women groups, it is easy to send to the market through middleman. Necessity of data base preparation covering market information widely.
Support for Marketing Route Development	Chicken raising activity is limited to the small scale avoiding risk of the disease. Besides the sales through local middleman, it can be realistic to develop other market route like local restaurant
Capacity Development Plan of Agribusiness Stakeholders	It is urgently required for district DNPV staff to improve their knowledge and technology to disease prevention.

4) Lessons learned Suggestion from the Pilot Project "Diversification of Corn Product"

Project	Lessons learned
Support for Set-up of Private Processing Industry	Target crop as raw material for processing industry should be produced stably in quantity, quality and price. To meet with this, it is required to be the crop cultivated and marketed widely in the country. It is important to find highly-motivated processors so as to encourage them to improve and develop commodity positively.
Provision of Agribusiness Information and Communication system	Imported wheat flour is available throughout the country at a fairly consistent average price. Corn flour is not readily available anywhere in the country and sells presently at a prohibitively high price except in Maliana. Corn and/or corn flour can be transported from Maliana to Dili at a reasonable cost but not to other areas. Provision of agribusiness market information or communication systems is of only limited usefulness as long as MTCI is setting prices for all major commodities.
Support for Marketing Route Development	Radio was the most effective media channel followed in order of effectiveness by newspapers, banners, flyers and posters.

5) Lessons learned Suggestion from the Pilot Project " Support for 'Local Product, Local Consumption' – Cooking Classes –"

Project	Lessons learned
Support for Set-up of Processing Industries by Farmers/Women's Groups	Cooking class might bring graduates to grow an awareness of cooking business.
Support for Specialized Products	Knowledge and cooking skills learned in the cooking classes would be helpful for finding products to be specialized in the locality and its commercializing process.

Project	Lessons learned
Provision of Agribusiness Information and Communication System	Food materials for cooking class, catering service and restaurant, are purchased from local marketplace by means of direct contact with sellers, calculating the expenses and profit.
Support for Marketing Route Development	There is a strong demand for continuation of the basic cooking classes at both existing venues and in additional locations. The participant recruitment techniques used in the pilot project were very successful and can be employed in future recruitment efforts.

(2) Suggestion to the Framework of Master Plan and Implementation Organization of the Action Plan

1) Suggestion to the Framework of Master Plan: Incorporation of the Program "Value Chain Improvement"

Basic role of the DNPIAC is to organize an effective cooperation relationship with related organizations and private sectors for establishing value chain as a core of agribusiness target crop. It was verified that further capacity development of DNPIAC organization and related private stakeholders was required in order to establish a value chain system.

Under such lessons learned, it is suggested that the program "Value Chain Improvement" incorporates into the framework of the Master Plan. Suggested program should provide the functions to support the activity in establishing product based value chain and guide human resources development of value chain stakeholders.

2) Suggestion to the Implementation Organization

Followings are suggested to the provision of implementation organization.

- 1) It is required to organize the implementation organization so as to enable to cooperate with related ministries and related MAF Directorates.
- 2) It is effective to incorporate relevant NGOs and private organizations/ groups into the implementation organization of the Action Plan, under the management and financial supports from the international aid agencies, until MAF provide budgeting and institutional conditions for realization of Action Plan.
- 3) It is realizable to take product based approach for materializing Action Plan

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ABBREVIATIONS

ADB	Asian Development Bank
AFTA	Asian Free
APEC	Asia-Pacific Economic Co-operation
ASC	Agricultural Service Centre
ASEAN	Association of South East Asian Nations
AusID	Australian Agency for International Development
APU	Agribusiness Promotion Unit
A/P	Action Plan
B/C	Benefit/Cost
CARE	Cooperative for Assistance and Relief Everywhere
CCT	Cooperative Café Timor
C/P	Counterpart
EC	European Commission
FAO	Food and Agricultural Organization (of the United Nations)
GDP	Gross Domestic Product
GM	Gross Margin
GIZ	German Development Agency
ICM	Integrated Crop Management
IFC	International Finance Corporation
IMF	International Monetary Fund
IRCP	Irrigation and Rice Cultivation Project
MAF	Ministry of Agriculture and Fisheries
MoI	Ministry of Infrastructure
MoE	Ministry of Education
MoH	Ministry of Health
MTCI	Ministry of Tourism, Commerce and Industry
MED	Ministry of Economy & Development
M/P	Master Plan
DNAF	Director Nacional de Administração & Finanças (En.) National Directorate for Administration & Finance
DNPP	Director Nacional de Política e Planeamento (En.) National Directorate for Policies & Planning
DNFA	Director Nacional de Formação Agrícola (En.) National Directorate for Agricultural Education

DNPSE	Director Nacional de Pesquisas e Serviços Especializados (En.) National Directorate for Research & Specialist Services
DNPIAC	Director Nacional das Plantas Industriais e Agro-Comércio (En.) National Directorate for Industrial Crops & Agribusiness
DNAH	Director Nacional de Agricultura e Horticultura (En.) National Directorate for Agriculture & Horticulture
DNF	Director Nacional das Florestas (En.) National Directorate for Forestry
DNPA	Director Nacional de Pescas e Aquicultura (En.) National Directorate for Fisheries & Aquaculture
DNPV	Director Nacional de Pequária e Veterinária (En.) National Directorate for Livestock & Veterinary Services
DNIGUA	Director Nacional de Irrigação e Gestão da Utilização de Água (En.) National Directorate for Irrigation & Water Use Management
DNQB	Director Nacional de Quarentina e Biosegurança (En.) National Directorate for Quarantine & Biosecurity
DNADC	Director Nacional de Apoio ao Desenvolvimento Comunitário Agrícola (En.) National Directorate for Agricultural Community Development
NGO	Non-Governmental Organization
NSD	National Statistics Directorate, National Statistics Office
RDTL	Republica Democratia de Timor-Leste
SDP	Strategic Development Plan
SIP	Sector Investment Program
SWOT	Strengths, Weaknesses, Opportunities and Threats
TFET	Trust Fund for East Timor
UNDP	United Nations Development Program
USAID	United States Agency for International Development
WB	World Bank
WTO	World Trade Organization

Unit

sq.m:	Square meter	sq.km:	Square kilometer	cu.m:	Cubic meter
m ² :	Square meter	km ² :	Square kilometer	m ³ :	Cubic meter
g:	Gram	kg:	Kilogram	lit:	Liter

Exchange Rate: 80.99 Yen/ 1.0 US\$ (as of July 2011, JICA designated rate)

CAPThER 1 SELECTION OF PILOT PLOJECTS

1-1 OBJECTIVES OF THE PILOT PROJECTS AND PLANNING FOR SELECTION OF THE PILOT PROJECTS

1-1-1 Objectives of the Pilot Projects

Objectives of the pilot projects were to verify:

- 1) Agribusiness model with specified products/ commodities proposed in the Draft Master Plan and Draft Action Plan and,
- 2) Effectiveness of proposed Draft Master Plan and Action Plan for promotion of agribusiness.

Draft Master Plan and Draft Action Plan were composed of 7 programs and 19 projects as shown in Tables 1-2-3, 1-2-4 and 1-2-6, and Figure 1-4-1. (Effectiveness was verified in the draft programs and projects. Through the verification of them, the program 7. 'Nurturing plan of agribusiness stakeholders' and the project 'Capacity development plan of agribusiness stakeholders' was modified.)

1-1-2 Planning for Selection of the Pilot Projects

Selection process of pilot projects was planned as follows.

- (1) Pilot project candidates were picked.
 - 1) Selection criteria was set to select pilot project candidates
 - 2) Based on the criteria, any pilot project candidates were selected.
 - 3) Implementation possibility of the selected pilot project candidates were surveyed and the survey results were compiled as the project outlines.
- (2) Pilot projects were selected from the pilot project candidates.
 - 1) Selection criteria were prepared.
 - 2) Pilot project candidates were screened with the selection criteria.
 - 3) Pilot projects were selected.

1-2 SELECTION OF PILOT PROJECT CANDIDATES

1-2-1 Setting the Selection Criteria

(1) Approach to Selection of Pilot Project Candidates

Effectiveness of the Draft Action Plan was verified through practicing the projects which were the component of the Draft Action plans. Then, some activities in the projects were practiced in the pilot projects. It was difficult to try all of the proposed projects under the budget limitation with the project implementation period. Then, some projects and/ or a part of the projects picked from the Draft Action Plan were practiced under the term and financial limitation. Necessary verification should be conducted through practicing such picked projects. For picking up the projects, therefore, it was the precondition that the projects were highly required to verify its contents. In addition, it was important to be the projects in which MAF can play as an implementation body.

Draft Action Plan was implemented by actors who engaged in production, processing, marketing and sales of agricultural products (farmers groups/ women groups and private sectors such as processing industry and traders) in cooperation with administration organization. Then, picked project was practiced by those

actors under the support from administration. The results were analyzed, evaluated and integrated so as to put on the verification of effectiveness of the Draft Action Plan

Considering the above, pilot project candidates were selected under the following conditions.

- 1) Pilot projects should include some activities of the proposed projects which is necessary to verify their implementation processes.
- 2) For pilot project, action groups were selected. Then, the selected action groups were supposed to practice some activities in the pilot project implementation, under the support from the administration organization. Pilot project candidates should provide necessary practice opportunity for them.

Action groups should be selected properly from the various fields of production, processing, marketing and selling of the agricultural products. Considering the present agribusiness situations from production to selling, action groups were categorized into the following three groups from viewpoints of the customer target.

Customer target	Action group	Promotion type corresponding action group (see Table 5-3-1 in the Master Plan Report)
Rich people living in and around city who has purchasing power	Action groups who are taking activities in production, processing, marketing and sales promotion, targeting on rich people.	High quality commodity processing/ marketing industry, Fresh products processing/ marketing industry, Local special product processing/ marketing industry
Consuming public	Activities in production, processing, marketing and selling are generally targeting on consuming public.	Import substitute commodity processing/ marketing industry, Demand expansion products processing/ marketing industry
Overseas consuming public	Action groups are acting in production, processing/ marketing and selling, targeting on overseas communing public.	Natural framing products export oriented processing/ marketing industry

In addition, those action groups were related to the agribusiness promotion types each of which had some specified products and customer target. The Table shows the relationship of the promotion type, development direction of each type, customer target and expected target products. For the pilot projects, it was desirable that the action groups were picked from each promotion type.

- 3) There was some different degree of relation between the promotion types and the proposed projects, as shown in Table 1-2-3. The Table shows which projects are necessary for which promotion types of processing/ marketing industry. Project was picked considering the degree of relation with the promotion types. Namely, the picked project should be close relation with a certain promotion type. In addition, it was considered that one project was practiced in the some different promotion types so as to clarify the output difference among those types.
- 4) Together with selection of action groups, target products including agricultural/ livestock/ fishery products and processed commodity were also related to the action groups. This was to grasp some difference in degree of supporting activities from administration organization among target products of agricultural crop/ livestock/ fishery production. Current domestic producing and marketing products in Timor-leste are classified into a) rice, b) legume, c) livestock, d) maize, e) industrial crop such as coffee, f) root crops, g) nuts, h) vegetable/ fruits, i) fishery, j) medical/

foliage plants. Target products to be dealt in the pilot project, was selected properly considering such classification so that degree of supporting activities from administration organization could be verified by products.

- 5) Relevant donors were practicing the supporting activities in the fields of processing/ marketing industries. So, it was desirable for the pilot project candidates to avoid overlapping any activities that the donors were operating. Then, if the selected action group with product was overlapped with those practicing by the related donors such as GIZ, the action group was basically not selected. However, if the objectives of those practices were different from the pilot project, it might be studied to seek any cooperation with the pilot project candidates.

Table 1-2-1 On-going Similar Actions Taken by Relevant Donors

Donors	Target products	Action	Targeted district
GIZ (EU)	Rice, Soybean, Mungbean	Support for production Support for trading	Bobonaro, Covalima, Manufahi
Portugal	Coffee/Cloves	Support for production	Ermera, Liquisa, Manufahi, Aileu
	Cashew/Coconuts	Support for production	Covalima, Bobonaro
	Maize/Peanuts	Support for production	Liquisa
JICA	Jam, Saboko, Chips making	SIPI	Baucau, Liquica, Ainaro
	Coffee	Support for Coffee growers cooperative	Ermera, Ainaro

(2) Basic Selection Criteria for Pilot Project Candidates

Basic selection criteria were provided for pilot project candidates, as follows.

- 1) Planning of the pilot project candidates was consistent with the proposed Draft Master Plan and Draft Action Plan.
- 2) Implementation effects so as to verify the proposed project could be appropriately generated within the pilot project implementation period of 1.5 years.
- 3) Implementation scale in terms of budget was in the moderate level.
- 4) Outcomes from the pilot project implementation were easily disseminated to the related areas/ farmer groups/ processors/ traders/ other related groups/ organizations with the products.
- 5) New establishment of administration organization or institutional system to implement the pilot project candidates was not required.
- 6) Project implementation might not cause any negative effects on social and physical environment. Then, effective measures for social and physical environmental consideration could be easily taken in the pilot project candidates.

1-2-2 Pilot Project Candidates

(1) Selection of Pilot Project Candidates

After discussion with the C/P about the approach and selection criteria mentioned in the 1-2-1, as a first step, necessity of verification of the projects framed in the programs were rated. The result is shown in Table 1-2-4. Sites and action groups were picked as the pilot project candidates through discussion with C/P staff, related to the agribusiness promotion types, considering on-going similar projects implementing by related donors.

Site survey and data/ information collection were conducted repeatedly at the sites with action groups to analyze and seek its feasibility. Discussion with C/P staff was repeated to pick up the pilot project candidates. As the collaboration with C/P, the 9 projects were picked as the pilot project candidates as shown in Table 1-2-2. The Table shows the list of the pilot project candidates related to the action group, target product and related agribusiness promotion type.

Table 1-2-2 List of the Pilot Project Candidates

No	Pilot project candidates	Action group	Target product	Agribusiness Promotion type
1	Capacity Development of Agricultural Cooperatives	Cooperative	High quality rice, Foliage plant	High quality commodity processing/ marketing industry
2	Value Chain Improvement for Soybean Products	Tofu processing industry Soybean produce farmer groups	Soybean(tofu, soymilk, tempe)	High quality commodity processing/ marketing industry
3	Production, Processing and marketing of Natural Farming Products	Natural farming farmers	Natural farming vegetable and fruits	High quality commodity processing/ marketing industry
4	Improvement on Logistic Support of Fishery Products	Fish traders	Fishery products (fresh fish)	Fresh products processing/ marketing industry
5	Promotion of Small Scale Business of Poultry Production by Women's Group	Chicken raising women groups	Livestock products (chicken and egg)	Import substitute commodity processing/ marketing industry
6	Diversification of Corn Product	Corn flour processor Bread making and sales industry	Corn	Import substitute commodity processing/ marketing industry
7	Support on 'Local Product, Local Consumption' - Cooking Class -	NGO Women groups	Root crops (cassava, potato, taro and corn, etc), corn and other crops.	Demand expansion products processing/ marketing industry
8	Specialization of Local Products	Palm wine processor Honey collecting farmers	Palm wine, Honey	Local special product processing/marketing industry
9	Improving Export Quality of Candle Nuts Products	Candlenut production farmer group	Industrial crop (candlenut)	Natural farming products export oriented processing/ marketing industry

(2) Survey for Action Groups of Pilot Project Candidates and Expected Project Outline

Action groups shown in the Table 1-2-2 were surveyed to sound about the project implementation. Present situation of the action groups including current production/ processing/ marketing activities and working capacity was surveyed through interviews with them. Expected project outlines and survey results are summarized in Table 1-2-5.

(3) Projects to be Verified in the Pilot Project Candidates

In order to seek which projects should be verified through the pilot project implementation, the relevance with the projects and agribusiness promotion types was studied by each pilot project candidate. The projects to be verified in the pilot project candidates were marked. By compiling the above results, the projects verified in each pilot project candidates are summarized in the Table 1-2-6.

Table 1-2-3 Relation between the Agribusiness Promotion Types and the Projects

Program	Project	High quality commodity processing/marketing industry	Fresh products processing/marketing industry	Import substitute commodity processing/marketing industry	Demand expansion products processing/marketing industry	Local special product processing/marketing industry	Natural farming products export oriented processing/marketing industry
1. Improvement of agricultural productivity	1.1 Establishment of seed/ input materials supply system		○	⊙	⊙		
	1.2 Rehabilitation of agricultural production infrastructures	○	○	○	○		○
	1.3 Strengthening of dissemination system of cropping technology		○	○	○		
	1.4 Promotion of contract farming	⊙					⊙
2. Support for promotion of processing industries	2.1 Support for set-up of private processing industry	⊙	○	⊙	○		⊙
	2.2 Support for set-up of processing industry by farmers/ women group	○	○	⊙	⊙	○	
	2.3 Support for specializing products					⊙	
3. Support for promotion of distribution industries	2.4 Support for provision of processing infrastructures	○	○	○	○	○	○
	3.1 Support for improvement of product transportation	⊙	⊙			○	
	3.2 Provision of agricultural distribution infrastructures	○	○	○	○	○	○
4. Support for sales promotion	3.3 Provision of an agribusiness information and communication system		○	⊙	⊙		
	4.1 Support for marketing route development	○	○	⊙	⊙	⊙	
	4.2 Introduction of agriculture produce grading system	⊙					⊙
5. Improvement of the government's products purchasing system	4.3 Improvement of sanitary management		⊙	○			
	4.4 Introduction of food safety inspecting system	⊙	○			○	⊙
6. Support for export promotion	5.1 Improvement of an operating system in central and local levels			○	○		
	6.1 Support for finding export commodity and its sales promotion						⊙
7. Nurturing plan of agribusiness stakeholders	6.2 Promotion of exporting						⊙
	7.1 Capacity development plan of agribusiness stakeholders	○	○	○	○	○	○

Degree of relation between the promotion types and the projects ⊙: This is the highly required project, ○: This is the moderately required project to promote this promotion type.

Table 1-2-4 Necessity of Verification of the Project

Program	Project	Necessity of Verification
1. Improvement of agricultural productivity	1.1 Establishment of seed/ input materials supply system	Project is to strengthen the present seed/ input materials supply system by DNAH. It is necessary to verify the system. Although methodology and responsibility of actors are roughly established, project activity should be verified. ○
	1.2 Rehabilitation of agricultural production infrastructures	Large scale irrigation rehabilitation relies on donor agencies. It is necessary to verify a series activity from research to implementation by DNI/GUA. For small scale irrigation projects, activity plan is not established. It is necessary to verify the project activities taken by district office. ○
	1.3 Strengthening of dissemination system of cropping technology	Project is to strengthen the present dissemination system of farming technology taking by DNADC. DNADC has allocated extension staff to each district. Concrete activities are not launched yet. It is necessary to verify extension activities taking by them. ○
	1.4 Promotion of contract farming	DNPIAC is responsible for this project. No systematic plans are prepared. It is necessary to verify the effectiveness of the project. The necessity is high. ○
2. Support for promotion of processing industries	2.1 Support for set-up of private processing industry	Product basis activity is done by GTZ, USAID and JICA. There is no systematic promotion plan integrated. It is necessary to verify the promotion process. Necessity of the verification is considered to be high. ○
	2.2 Support for set-up of processing industry by farmers/ women group	Same as the 2.1. Present project activities are done depending on related donors and NGOs. No established supporting plan is formulated. It is required to verify the effectiveness and responsibility of actors. ○
	2.3 Support for specializing products	Supporting method is being established based on the lessons learnt from SIPI in association with JICA. Project activities should be verified through review of the lessons and responsibility of actors including administration. ○
	2.4 Support for provision of processing infrastructures	System to provide nation-wide electricity and water supply system is established. But, under the present conditions, it is required to provide them for processing industry. It is necessary to verify the provision system by administration. ○
3. Support for promotion of distribution industries	3.1 Support for improvement of product transportation	No established plan to support. Necessity of verification is high. ○
	3.2 Provision of agricultural distribution infrastructures	For project implementation, actors and responsibility are clarified. Necessity of verification is relatively low. ×
4. Support for sales promotion	3.3 Provision of an agribusiness information and communication system	It is necessary to verify the project activities taken by DAPIAC to establish agribusiness information supply system, since no systematic system is established. ○
	4.1 Support for marketing route development	It is required to verify the proposed project activity together with activities of MTCI and MED. ○
	4.2 Introduction of agriculture produce grading system	The project activity is to introduce quality standard to help high quality added commodity to sell high price. There is no activity taking for this project. Then, it is required to verify the project activity. ○
	4.3 Improvement of sanitary management	It is necessary to verify the process of project activity aiming to improve sanitary management of the marketplace and abattoir, and meat safety inspection system. △
5. Improvement of the government's products purchasing system	4.4 Introduction of food safety inspecting system	Although there is a standard related with food safety based on the Indonesian standard, inspection system is not established. Then, it is necessary to verify the project activity for introduction of food safety inspection system taken by MoH. △
	5.1 Improvement of an operating system in central and local levels	There are operation problems in the present purchasing system. It is required to improve it. It is necessary to verify the project activity in cooperation with related ministries under MTCI. △
6. Support for export promotion	6.1 Support for finding export commodity and its sales promotion	Project activities rely on private sectors. It is necessary to verify the administration activity to support private sectors. ○
	6.2 Promotion of exporting	It is necessary to verify the improvement activity such as export documentation and quarantine systems. ○
7. Nurturing plan of agribusiness stakeholders	7.1 Capacity development plan of agribusiness stakeholders	There is no nurturing plan at present. Project activity relies on related donors' projects. It is necessary to verify the project activity process for human resources development for making agribusiness operation well. ○

Standard and rating for necessity of verification is set as follows.

○: Activity in the project is not established. It is highly required to verify the effectiveness.

△: Although project activity in the project is required to verify, requirement is not high compared with the highly required projects. Administrations except MAF are largely involved.

×: Activity process in the project is established. Necessity of verification is low compared with those of the other two types of the projects.

Table 1-2-5 Survey Results of Action Groups of Pilot Project Candidates and Expected Project Outlines

No	Pilot Project candidates	Action Groups	Result of Action Group's Survey	Expected Project Outline	
				Objective	Activity plan
1	The Pilot Project for Capacity Development of Farmer's Groups and Agricultural Cooperatives	Cooperative of Rice Production (Laga, Baucau)	The cooperative consists of 25 members and has a 35-ha cultivated land in Laga. The present main activity is cultivating paddy rice and conducting a cooperation shipment of their harvest. It can be noted that the cooperative is selling their rice not to MTCI but to some supermarkets in Dili directly. So, it is expected as a model site of the producer's marketing rice. However, to be so, it is necessary to produce higher quality rice at higher price to coexist with MTCI cheap rice in the market. Also, it needs to reinforce their financial stability by introducing cash crops. Although, they once practiced pump irrigation farming with assistance from GTZ, they are now facing a serious water shortage problem from April to June since GTZ assistance was removed.	This Pilot Project focuses on Saigirous cooperative for rice production in Laga, which is registered by the National Directorate of Cooperatives, Ministry of Economic Development. The objective of the project is to promote the processing and distribution of rice and vegetable through strengthening organization.	<ul style="list-style-type: none"> - To strengthen the foundations of the agricultural production through improving irrigation system. - To conduct an agricultural training to increase quality of rice. - To conduct a training about management of cooperative. - To create additional value through improving package, quality grading, and establishing a brand. - To improve transportation method to prevent damage of products.
		Cooperative of Flowering Plant Production (Dili)	The cooperative consists of 59 members. Their activities are to cultivate flowering plants and to sell them in a market in Dili. Because the government offered them a place for flower market for free, the cooperative is in a relatively favorable situation in terms of marketing their products. However it is observed that the cooperative has some problems with their organization management skill, especially management of their fund collected from the members. They also have problems of shortage of the scissors for gardening and lacking some facilities in their provided market such as toilet, roof at the store, and so on.	This Pilot Project focuses on Dare Habras cooperative of foliage plant production in Dili, which is registered by the Directorate of Cooperatives, Ministry of Economic Development. The objective is to promote foliage plant production and marketing business through the organization reinforcement.	<ul style="list-style-type: none"> - To conduct a training about organization management to the cooperative members. - To create additional value through improving container of foliage plants to be more attractive to customers. - To improve transportation method to prevent damage of products. - To improve the environment of storing foliage plants for keeping their quality.
2	The Pilot Project for Value Chain Improvement of Soybean Products	Soybean Producer (Bobonaro, Manufahi) Soybean Trader (Bobonaro)	In the area where soybean traders or MTCI are absence, it is generally a serious matter for soybean producers to insecure channel they sell their products. Under such a situation of soybean marketing, it is observed that one soybean producing cooperative in Fatuberliu tried to sell their products to tofu producer in Dili from this year. The amount of soybean they sold was still small (2t) but it could be an occasion to establish a contract farming. The contract farming between such a cooperative and a tofu making supplier has a potential to be popularized in the future. It is found that the large-scale buying of the soybean by traders is only seen in Bobonaro district so far. A purchased soybean is transported to Dili and sold mainly for the export trader. Although it is a little amount, marketing to tofu supplier in Dili is also done. To develop to the contract farming is expected in the future.	This Pilot Project aims to improve the value chain of the soybean products through establishing linkage between domestic soybean producers and soybean processors, such as tofu and tempe manufacturers, and facilitate development of soybean product industry.	<ul style="list-style-type: none"> - To promote contract farming through mediating between soybean processors and soybean producers who are interested in contract farming. - To support for agreement of the contract farming and monitor it. - To conduct an agricultural training for soybean producers to satisfy the quality standard of the contract farming. - To support soybean processors to improve technology of tofu and tempe manufacturing. - To support development of new soybean products, such as soymilk.

No	Pilot Project candidates	Action Groups	Result of Action Group's Survey	Expected Project Outline	
				Objective	Activity plan
3	The Pilot Project for Production, Processing and Marketing of Natural Farming Products	Donors and NGOs who are trying to extent natural farming method	OISCA International has conducted human resource development in the agricultural field since 1996 in the Timor-Leste. One of their main activities is to popularize the natural farming. In 2002, they established regional development training center in Liquica, and have conducted 14 times of long-term agriculture trainings so far. Also, as for the efforts to the high quality vegetable production, "Agribusiness Horticulture Program" is implemented by USAID.	The purpose is to promote natural farming in Timor-Leste. The Pilot Project establishes a certification system to approve vegetables which were produced by the natural farming method, and conducts promotion of natural farming vegetables as high quality farm products.	<ul style="list-style-type: none"> - To conduct a natural farming training to farmers' groups - To establish a certification system to approve natural farming vegetables for additional value creating. - To pioneer sales-channel of natural farming vegetables targeting wealthy customers in downtown areas. - To improve transporting method to prevent quality deterioration of natural farming vegetables.
4	The Pilot Project for Improvement on Logistic Support of Fishery Products	Fish Trader (Viqueque) Fishery Cooperative (Manufahi)	This is a fish trader who purchases fresh fish from fishermen in Beaco and transport it to restaurants and hotels in Dili. They use ice which they buy from Baucau for transportation of fresh fish, but during trip returning from Baucau to Beaco about 30% of ice is lost by melting. Leasing of freezing facility can make them produce ice by themselves. It can be expected the reduction of transportation cost, and also increasing amount of purchasing fish from fishermen will make fishermen's income increase around Beaco. This is a fishery cooperative which consists of 26 members in Betano. They received sun power generator, wind power generator, and refrigerator from Malaysian assistant in past. Nevertheless, it has a problem in the system design of the inadequate capacity of solar power generator and installing improper place of wind power generator. So, those facilities are not utilized for keeping or transporting of fresh fish at present. Their main customers to sell fish are traders coming from Same and they do not bring fish to other market to sell. The activity of the cooperative can not be called liveliness and systematic activity such as the cooperation shipment of the fresh fish is hardly seen. In the future, it is necessary to strengthen in the organization management.	This Pilot Project aims to facilitate fishery industry in East-Timor through improving environment of fresh fish transportation by introducing a refrigerator leasing system run by the government to public fresh fish traders or fishery cooperatives.	<ul style="list-style-type: none"> - To lease refrigerating equipment to fresh fish traders or fishery cooperatives. - To collect leasing fee of refrigerator equipment and provide maintenance. - To improve transportation method in order to prevent quality deterioration of fish products. - To support pioneering market activity of fresh fish. - To evaluate profit and loss of the leasing system of refrigerator to verify sustainability of the system. - To estimate cost-benefit of fresh fish transportation/ sales

CHAPTER 1 SELECTION OF PILOT PROJECTS

No	Pilot Project candidates	Action Groups	Result of Action Group's Survey	Expected Project Outline	
				Objective	Activity plan
5	The Pilot Project for Promotion of Small-scale Poultry Business by Women's Group	NGO supporting woman group's activities (Alola, Head office in Dili)	Alola is a NGO supporting woman group's activity over 13 districts. Alola's activities consist of agricultural training, information sharing such as the access to the judiciary, and poultry farming. In the poultry farming program, each member is provided \$50 as the first time buying expenses of the chicken (The price of the chicken is about \$8 to \$10 in local market). In the project area which is in Viqueque, they breed chickens and the number of chickens is now more than 100. Also, MAF supports Alola's poultry program providing vaccine for chickens. In the future, it is seemed that the securing of feed, the technical support of the bird influenza prevention, the market pioneering to sell an egg and chicken meat, and the support of starting up a small business by woman's groups are necessary. Also, the introduction of Muscoby Duck which is supposed to be resistant to illness can be an effective option.	This Pilot Project aims to support small scale poultry business run by local women groups to increase supply of domestic chicken meat and egg from farm village level, and verifies the effectiveness of domestic poultry business to be import subsidize products.	<ul style="list-style-type: none"> - To conduct a training about the poultry farming to women groups. - To improve henhouse in aspect of good hygiene as the disease presentation of the chicken. - To cooperate with government services such as vaccination. - To secure the procurement source of the corn to utilize as feed for chickens. - To collect basic information for the market database building about poultry products. - To support development of new market such as provision of school lunch program.
6	The Pilot Project of Diversification of Corn Products	Bakery (Dili, Baucau, Same)	In East Timor, the habitude to eat bread in the breakfast spreads widely by influence of the Portugal government era. In such a situation, there are a lot of bakeries over the whole country and competition in sales in some areas. For those bakeries, the price of the flour greatly affects their income and expenditure. It is often seen that some bakeries have the big difficulty to manage since the price of the flour hike up in these days. The bread which is widely popular at present is manufactured from the wheat flour. It can be expected that to introduce corn flour contributes to increase consumption of domestic corn, to reduce bread manufacturing costs, and to make differentiation of products from competitors.	This Pilot Project is designed to verify possibility of corn flour to be a substitution product to import wheat flour in terms of bread manufacturing. The Pilot Project widely introduces corn flour to bakeries in major districts and campaigns to encourage using corn flour for their bakery products.	<ul style="list-style-type: none"> - To secure procurement source of domestic corn flour. - To collect basic information for the market database building about the corn. - To campaign to encourage using corn flour to bakeries. - To monitor profitability of corn bread through selecting bakeries.
7	The Pilot Project for Support on 'Local Product, Local Consumption' – Cooking Class -	NGO (Christian Vision, Head office in Dili)	Christian Vision is a NGO run by Christian church organization in England. The volunteers of Christian Vision provide several educational activities such as agricultural products processing and the cooking, the PC operation, the language study (Portugal, English), and the sewing. Especially, the cooking class is one of their most popular activities. The class is provided to local women using local farm products for ingredients. In the district where is relatively near to market such as Baucau, it is observed that some woman who complete the cooking class started to sell foods cooked by themselves in the market. Hereafter, it is expected that the class will introduce nutritional and hygiene aspect as well as a wide variety of recipes which promotes consumption of local farm products.	The Pilot Project aims to promote consumption of domestic farm products, such as corn, potato, cassava and so on, through introducing cooking class which uses local produced ingredients to housewives in rural area.	<ul style="list-style-type: none"> - To conduct a training for cooking instructors of the cooking class. - To make textbook and cooking recipe book which are used for the cooking class - To advertise the cooking class and recruit participants. - To conduct cooking class. - To support starting small scale business activities done by women who complete the cooking class. - To collect basic information for market database building about the domestic farm products.

No	Pilot Project candidates	Action Groups	Result of Action Group's Survey	Expected Project Outline	
				Objective	Activity plan
8	The Pilot Project for Specialization of Local Products	Palm Wine Producer (Manatuto)	The palm wine which is produced by the traditional making method is widely seen in the local market at East Timor. Manufacture is mainly done from March to October. The average selling price is about \$2 for a 1.5l bottle and \$1 for a 600ml bottle. However, customers currently can not distinguish high quality and low quality of palm wine because the selection of quality is not done in manufacturing process and it is usually packed in a bottle mixed with high quality and low quality of palm wine together. The problems to be solved in the future are to sort out high quality palm wine, to improve bottling and branding to sell at higher price. Also, the improvement of hygiene in the manufacturing process needs to be considered.	This Pilot Project attempts to promote local specialized products through supporting palm production.	<ul style="list-style-type: none"> - To improve current activities of marketing palm wine products. - To improve quality of palm wine products. - To create additional value through improving package and label. - To conduct sales promotion as high quality palm wine products. - To establish an antenna shop in Dili and promote local specialized products in cooperation with OVOP project (SIP).
		Natural Honey Producer (Manatuto)	Their activities are collecting honey and bee wax from natural giant bee and marketing them. There are three harvest periods per a year, January, April, and August. The honey produced in April is considered as a highest quality. It is sold in a 5 liter container at \$5. The major customer is traders who come from the Western Timor for buying. The problem to be solved in the future is improving packaging and branding, aspect of hygiene in manufacturing process, also developing marketing. There is also anxiety that excessive hunting of honey bee can lead endanger of a species.	This Pilot Project attempts to promote local specialized products through supporting honey production which is produced from natural giant honey bee by local farmers' groups.	<ul style="list-style-type: none"> - To improve current activities of marketing natural honey products. - To improve quality of natural honey products. - To create additional value through improving package and label. - To conduct sales promotion as high quality natural honey products. - To establish an antenna shop in Dili and promote local specialized products in cooperation with OVOP project.
9	The Pilot Project for Improving Export Quality of Candle Nuts Production	Candle Nuts producer (Baucau)	Their activities are cultivating candle nuts, producing candle nut oil, and exporting candle nut oil to Indonesia and Hawaii. They have a factory in Baucau by the support of GTZ. However, because of low quality of candle nuts, nearly 50% of their products have been rejected and returned. The main cause of degrading quality of candle nuts is seemed to be affected by mold. They started exportation from 2006 but the export volume is not increasing. The problems to be solved in the future are improvement of candle nuts quality in cultivation level, and also in processing level after harvesting such as drying, peeling, and packaging.	In Timor-Leste, it is seen that the industry of exporting candle nuts oil products to Hawaii is gradually becoming to be on right track. However, it faces difficulties of low quality of candle nuts oil products caused by unstable quality of candle nuts in production level. This Pilot Project intends to promote export products after coffee beans though improving quality of candle nuts production.	<ul style="list-style-type: none"> - To conduct an agricultural training for candle nuts producers to satisfy the quality level for exporting. - To introduce candle nuts producers who are interested in contract farming to the candle nuts oil manufacturer. - To support for agreement of the contract farming and monitor it.

Table 1-2-6 Projects Verified in the Pilot Project Candidates

Program	project	Pilot Project Candidates								
		No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9
1. Improvement of agricultural productivity	1.1 Establishment of seed/ input materials supply system									
	1.2 Rehabilitation of agricultural production infrastructures	○								
	1.3 Strengthening of dissemination system of cropping technology									
	1.4 Promotion of contract farming		○							○
2. Support for promotion of processing industries	2.1 Support for set-up of private processing industry		○		○					○
	2.2 Support for set-up of processing industry by farmers/ women group	○		○		○		○		
	2.3 Support for specializing products								○	
	2.4 Provision of processing infrastructures				○					
3. Support for promotion of distribution industries	3.1 Support for improvement of product transportation	○		○						
	3.2 Provision of agricultural distribution infrastructures						Necessity of verification is low. (*1).			
	3.3 Provision of an agribusiness information and communication system					○		○		
	4.1 Support for marketing route development				○		○		○	
4. Support for sales promotion	4.2 Introduction of agriculture produce grading system	○		○						○
	4.3 Improvement of sanitary management(*3)									
	4.4 Introduction of food safety inspecting system						New institutional system may be required for this project implementation. (*2)			
	5.1 Improvement of an operating system in central and local levels						New institutional system may be required for this project implementation. (*2)			
6. Support for export promotion	6.1 Support for finding export commodity and its sales promotion									○
	6.2 Promotion of exporting									
7. Nurturing plan of agribusiness stakeholders	7.1 Capacity development plan of agribusiness stakeholders	○								

○: Verified in the pilot project.

*1: Necessity of verification is low (see Table 1-2-5).

*2: Based on the criteria in the section 1-2-1, this project may be required to establish new organization and/ or institute in order to lead project activity.

*3: Other related administration organizations except MAF are relevant to project planning and implementation.

1-3 SELECTION OF PILOT PROJECTS

1-3-1 Selection Criteria

Pilot projects were selected from the 9 candidates. Through the discussion with C/P staff, an implementation priority was set as selection criteria, to narrow the 9 candidates to several numbers with suitable scale. Subsequently, selection criteria to rate the implementation priority was discussed with C/P staff. As the discussion results, basic concept and rating items as shown in Table 1-3-1 were provided.

Table 1-3-1 Criteria for Rating of Implementation Priority

Basic Concept	Rating Items
A. Impact on improvement of processing and marketing industry system.	A-1. Does the pilot project contribute to national food security policy? National food security policy from viewpoints of promotion of processing and marketing industries should be prioritized on realization of effective measures to cope with present excess of imports. Accordingly, pilot project is expected to contribute to national food security policy. Then, higher priority should be put on the pilot project which may deal in domestically produced products in a series from production, processing/ marketing to selling.
	A-2. Does the consumer target put on the public? If consumer target of the pilot project puts on the limited rich people who are living in the cities, an implementation effect on country's processing and marketing industries is likely to be small since future market after the pilot project may be stagnant on small rich consumer group although related industry may get a certain economic profit. If consumer target puts on the consuming public, the pilot project may cause ripple effect in wide area although it may not bring large economic profit in short term.
B. Expected to be pilot.	B-1. Does the pilot project implementation contribute to capacity development of farmers/processors/ traders?
	B-2. Does the pilot project implementation cause a great extension effect on agribusiness field?
	B-3. Does the pilot project try to practice any useful pilot activities so that DNPIAC has not experienced in the past?
C. Expected to be general social and economic feasibility.	C-1. Are beneficial people expected to be large extent so that implementation effect can be easily extended to others?
	C-2. Is the pilot project likely to be feasible in cost and benefit analysis?

1-3-2 Selection Process

Selection of the pilot projects was conducted as follows.

- 1) Rating method was based on the scoring system with 3 grades. Criteria for scoring were set as shown in Table 1-3-4. Scoring was made in collaboration with C/P staff. The results are shown in Table 1-3-2.

Table 1-3-2 Scoring with Three Grades for Pilot Project Candidates

No.	Pilot Project Candidates	A: Impact on Agribusiness		B: Pilot Element			C: General Effect	
		A-1	A-2	B-1	B-2	B-3	C-1	C-2
		Food Security Policy	Consuming Public	Capacity Development	Extension effect	Pilot Element	Beneficial people	Cost benefit
1.	Capacity Development of Agricultural Cooperatives							
	Saigueros Cooperative	3	3	3	2	3	2	2
	Dare Haburas Cooperative	1	1	3	1	3	1	3
2.	Value Chain Improvement of Soybean	3	3	2	3	3	3	2
3.	Production, Processing and Marketing of Natural Farming Products	2	2	2	2	1	3	3
4.	Improvement on Logistic Support of Fishery Products	2	1	2	2	3	1	3
5.	Promotion of Small Scale Business of Poultry Production by Women's Group	3	3	3	3	2	3	2
6.	Diversification of Corn Product	3	3	2	3	3	3	1
7.	Support on 'Local Product, Local Consumption'- Cooking Classes	3	3	3	3	2	3	1
8.	Specialization of Local Products							
	Supporting Palm Wine Production	3	2	2	2	1	2	3
	Supporting Natural Honey Production	3	2	2	1	2	1	3
9.	Improving Export Quality of Candle Nuts Production	1	1	2	2	1	2	2

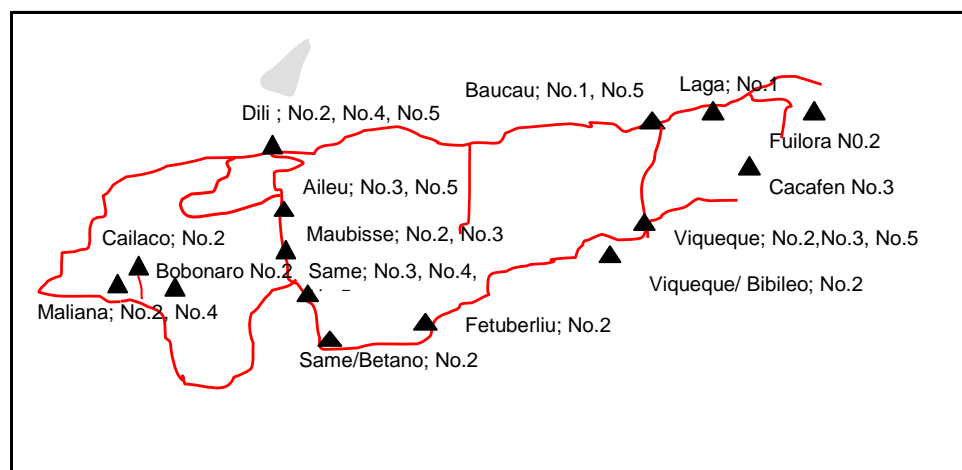
- 2) In order to narrow the 9 candidates down to suitable number, revise coefficient as shown in Table 1-3-4 was put on the each rating item with three grades. Based on the sum of revised score, implementation priority was evaluated on each candidate.
- 3) Scoring with revise coefficient of each candidate is shown in Table 1-3-3. Total score was counted. Priority was considered based on the total score.

Table 1-3-3 Rating for Implementation Priority of Pilot Project Candidates

No.	Pilot Project Candidates	A: Impact on Agribusiness		B: Pilot Element			C: General Effect		Total Score (Full: 9 points)
		A-1	A-2	B-1	B-2	B-3	C-1	C-2	
		Food Security Policy	Consuming Public	Capacity Development	Extension effect	Pilot Element	Beneficial people	Cost benefit	
1.	Capacity Development of Agricultural Cooperatives								
	Saigueros Cooperative	1.5	1.5	1.0	0.7	1.0	1.0	1.5	8.2
	Dare Haburas Cooperative	0.5	0.5	1.0	0.3	1.0	0.5	1.5	5.3
2.	Value Chain Improvement of Soybean	1.5	1.5	0.7	1.0	1.0	1.5	1.0	8.2
3.	Production, Processing and Marketing of Natural Farming Products	1.0	1.0	0.7	0.7	0.3	1.5	1.5	6.7
4.	Improvement on Logistic Support of Fishery Products	1.0	0.5	0.7	0.7	1.0	0.5	1.5	5.9
5.	Promotion of Small Scale Business of Poultry Production by Women's Group	1.5	1.5	1.0	1.0	0.7	1.5	0.7	7.9
6.	Diversification of Corn Product	1.5	1.5	0.7	1.0	1.0	1.5	0.5	7.7
7.	Support on 'Local Product, Local Consumption'- Cooking Classes	1.5	1.5	1.0	1.0	0.7	1.5	0.5	7.7
8.	Specialization of Local Products								
	Supporting Palm Wine Production	1.5	1.0	0.7	0.7	0.3	1.0	1.5	6.7
	Supporting Natural Honey Production	1.5	1.0	0.7	0.3	0.7	0.5	1.5	6.2
9.	Improving Export Quality of Candle Nuts Production	0.5	0.5	0.7	0.7	0.3	1.0	1.0	4.7

1-3-3 Selection of Pilot Projects

As the results of rating processes with C/P staff, it was concluded that although total score does not show much difference, the following 5 pilot projects were selected as high implementation



priority project. Pilot projects were implemented in 13 sub-districts of 8 districts.

- No.1: Capacity Development of Agricultural Cooperatives (Saigueros Cooperative)
- No.2: Value Chain Improvement of Soybean
- No.3: Promotion of Small Scale Business of Poultry Production by Women's Group
- No.4: Diversification of Corn Product
- No.5: Support on 'Local Product, Local Consumption'- Cooking Classes

Table 1-3-4 Criteria for Scoring Rating Items

Basic concept	Rating items	Present situation on the rating items	Scoring system with 3 grades Score (priority): 3(high), 2(moderate), 1(low)	Revise coefficient
A: Impact on improvement of Agribusiness	A-1: National food security policy	In Timor-Leste, much agricultural products and processed commodities such as rice are imported and sold in market. Then, it is emphasized in the national development plan that realization of food security is the most important goal. Then, government priority is put on the promotion of production, processing and marketing of the domestic products.	3: Target product of the pilot project is much imported and sold in the most of local markets competing with domestic one. Pilot project aims to promote processing, marketing and selling of domestic product as substitute for import. Then, outcome of the pilot project is expected to contribute largely to improvement of the present import surplus of the product. 2: Although target product of the pilot project is not much imported, some are sold in the some market. Pilot project contributes to improvement of import surplus as substitute import product through promoting processing and marketing activities of the target product. Then, outcome of the pilot project is expected to contribute to the national food security policy to some extent. 1: Importing amount of the target product is limited. The pilot project would promote domestic processing, marketing and selling activities. Outcome of the pilot project is expected to contribute to the national food security policy. But, contribution degree is likely to be small.	1/2
	A-2: Consuming public	Target of consumer is classified into three groups; rich people who live in the city and have high purchasing power, urban people who have cash income opportunity, and most of rural people whose purchasing power are small.	3: Sales target of product of the pilot project is put on the three groups. 2: Sales target probably is put on the rich people and urban people. 1: Sales target is put on the rich people including overseas consumers.	1/2
B: Pilot and challenging element	B-1 : Capacity development	Aid projects by donor's agencies and NGOs provide stakeholders learning opportunities of capacity development through technology transfer. Provision of such learning opportunities is limited in the processing and marketing fields. Progress of capacity development is largely dependent on learning consciousness and technical level of stakeholders and target groups. In the pilot project implementation, input of human	3: Inputs of human resources and physical materials through pilot project implementation are largely expected to contribute to the capacity development of stakeholders. Judging from the present capacity of target groups, pilot project will be able to provide target groups for basic learning opportunity so that they can obtain basic technology for sustainable project operation. If knowledge and facilitation would be timely provided them from outside resources after completion of the pilot project, capacity development of them would be further promoted. 2: Human resources inputs in the pilot project implementation help target groups to secure project sustainability and support their self-reliance. Judging from the present implementation capacity of the target groups, it is required for	1/3

Basic concept	Rating items	Present situation on the rating items	Scoring system with 3 grades Score (priority): 3(high), 2(moderate), 1(low)	Revise coefficient
		resources and physical materials should be suitable in their technology level. Target groups are expected to become independent after completion of the pilot project.	being secure of project sustainability to provide continuous human resources inputs and technology support for them. 1: Pilot project activities contribute to capacity development of the target groups. But, in order to reach their capacity development in a certain level, it is required to conduct continuous inputs in the financial, human resources and technical fields.	
B-2: Extension Effect		In general, extension activities are conducted in the aid projects by donor agencies and NGOs. But, those activities in the processing and marketing fields for agricultural products are very limited.	3: Through learning from the pilot project implementation, target groups such as farmers groups/ women groups/ traders will be able to set up same kind of processing or marketing industry without any support from outside. The pilot project is expected to bring large extension effect including organizing new action groups and setting up of processing or marketing industry. 2: By observing and learning from the pilot project implementation, similar action groups will be able to improve their business activities by their own initiatives without any large inputs from outside. The pilot project is expected to bring a certain extension effect to similar action groups. 1: Similar action groups will be able to improve their business manner, by observing and learning from the pilot project implementation But, to extend the outcomes of the pilot project, it is required to provide financial, human resources and technical supports for them. Then, extension effect during the pilot project is probably smaller than the above rating cases.	1/3
B-3: Useful pilot activities for DNPIAC		DNPIAC has experiences to participate in related donors and NGOs projects which include in processing and marketing fields. DNPIAC has learned lessons from such past experiences. Then, for DNPIAC, pilot project activities are expected to be new challenges and trials.	3: Contents of the pilot project activity are so new and challenging that DNPIAC has no experiences. Target product of the pilot project is a new commodity which does not sold in the markets. Then, the target product is expected to extend new market channel development through developing value-adding processes in the pilot project implementation. 2: Pilot project includes new and challenging activities for DNPIA, not experienced yet. Target product of the pilot project is usually sold in the market. 1: Similar activities to the pilot project have been led by related donors. Target product of the pilot project is usually sold in the market.	1/3
C: General social and	C-1: Expected number of	According to the survey, the number of people or household in one group	3: Based on the expected number of action group in the pilot project, the total number of beneficial people is expected more than 31 people or households.	1/2

Basic concept	Rating items	Present situation on the rating items	Scoring system with 3 grades Score (priority): 3(high), 2(moderate), 1(low)	Revise coefficient
economic feasibility	beneficial people C-2: Possibility of cost and benefit analysis	<p>except processing and marketing industry is counted at from 10 to 30 people or households. On the other hand, according to the information related to the cooperatives, the number of registered members in one cooperative is from 18 to 50, although the count is included practical non-active members. Considering such actual situations, the number of beneficial people in an action group is averagely from 10 to 30 households or beneficial people. Beneficial people will increase in number on the number of action group.</p> <p>In order to ensure sustainability of the project, it is essential for target group to grow agribusiness operation sense. Then, it is the precondition for target product that an analysis of cost and benefit from its processing and selling can be estimated in the pilot project implementation. Target group is also expected to get economic benefit from the pilot project.</p>	<p>2: Based on the expected number of action group in the pilot project, the total number of beneficial people is expected from 10 to 30 people or households.</p> <p>1: Based on the expected number of action group in the pilot project, the total number of beneficial people is expected less than 10 people or households.</p>	
			<p>3: Cost and benefit analysis of target product will be surely estimated through pilot project implementation. And, it is expected that target group get much economic benefit from pilot project implementation.</p> <p>2: Cost and benefit analysis of target product will be probably estimated through pilot project implementation. It is expected that target group get economic benefit to some extend.</p> <p>1: It will be difficult to estimate cost and benefit quantitatively. Although non-quantitative effects will be expected, it will be difficult to get certain economic benefit in the pilot project implementation.</p>	1/2

1-4 BASIC OPEARTION PLAN OF THE PILOT PROJECTS

1-4-1 Basic Approach to the Pilot Project Implementation, Monitoring and Evaluation

(1) Pilot Project Implementation Organization

Pilot project implementation organization was established. The organization was established by the central and district DNPIAC who were the implementation body and technical supporting groups who assisted the action groups. It might be required for related MAF Directorates and Ministries to participate in the pilot projects. DNPIAC was responsible to make arrangement with those related organizations as required.

(2) Approach to Pilot Project Evaluation

The pilot projects were evaluated from the view points of the five evaluative items; Validity, Effectiveness, Efficiency, Impact and Sustainability. The comments in the two seminars were considered in those evaluations. The results of the evaluation were shown by narrative description in the each item. Also, those evaluation results were graded into five levels which were shown from 5 to 1 score. This grading was to be conducted in accordance with the grading criterion which is shown in the following table. Sum of the score is indicated as the result of each final evaluation.

Score	Grading Criterion
5	The performance of the pilot project is considered to have highly exceeded the expectation level in the PDM from the view point of the each evaluative item.
4	The performance of the pilot project is considered to have exceeded the expectation level in the PDM from the view point of the each evaluative item.
3	The performance of the pilot project is considered to have reached the expectation level in the PDM from the view point of the each evaluative item.
2	The performance of the pilot project is considered not to have reached the expectation level in the PDM from the view point of the each evaluative item.
1	The performance of the pilot project is considered to have deeply fallen below the expectation level in the PDM from the view point of the each evaluative item.

1-4-2 Draft Action Plan to be Verified in the Pilot Projects

Effectiveness of the Draft Master Plan and Draft Action Plans was verified through implementation of the pilot projects. In the pilot projects, some activities in the Draft Action Plans prepared within the framework of Draft Master Plan were trialed. Through these trials, effectiveness was verified.

Which the Draft Action Plans or Projects to be verified in the pilot projects were designed in line with the contents of the Draft Action Plans/Projects and activities designed in the five pilot projects. The list of Draft Action Plans and Projects to be verified in the pilot projects was made as follows.

Framework of Master Plan		Pilot Project				
Program	Draft Action Plan	1	2	3	4	5
	Project					
1 Improvement of agricultural productivity	1.1 Establishment of seed/ input materials supply system		○			
	1.2 Rehabilitation of agricultural production infrastructures	○				
	1.3 Strengthening of dissemination system of cropping technology	○	○			
	1.4 Promotion of contract farming		○			
2 Support for promotion of processing industries	2.1 Support for set-up of private processing industry		○		○	
	2.2 Support for set-up of processing industry by farmers/ women group	○		○		○
	2.3 Support for specializing products					○
	2.4 Support for provision of processing infrastructures			○		
3 Support for promotion of distribution industries	3.1 Support for improvement of product transportation	○				
	3.2 Provision of agricultural distribution infrastructures	No necessity of verification.				
	3.3 Provision of agribusiness information and communication system			○	○	○
4 Support for sales promotion	4.1 Support for marketing route development			○	○	○
	4.2 Introduction of agriculture produce grading system	○	○			
	4.3 Improvement of sanitary management					
	4.4 Introduction of food safety inspecting system	Institution to be improved.				
5 Improvement of the government's products purchasing system	5.1 Improvement of an operating system in central and local levels	Institution to be improved.				
6 Support for export promotion	6.1 Support for finding export commodity and its sales promotion					
	6.2 Promotion of exporting					
7 Nurturing plan of agribusiness stakeholders	7.1 Capacity development of agribusiness stakeholders	○	○	○	○	○

○: to be practiced.

- No.1: Capacity Development of Agricultural Cooperatives
- No.2: Value Chain Improvement for Soybean Products
- No.3: Promotion of Small Scale Business of Poultry Production by Women's Group
- No.4: Diversification of Corn Products
- No.5: Support for 'Local Product, Local Consumption'- Cooking Classes -

Figure 1-4-1 Draft Action Plan to be Verified in the Pilot Projects

CHAPTER 2 CAPACITY DEVELOPMENT OF AGRICULTURAL COOPERATIVES

2-1 IMPLEMENTATION PLAN

2-1-1 Objective

This Pilot Project aims to verify promotion processes how rice and vegetable which are produced by the existing agricultural cooperatives are well processed and distributed to local markets under their own initiative management, through strengthening their cropping and business operation capacity.

2-1-2 Verification Theme

- The method of administrative support by MAF in improving the operation from production to selling of cooperative's produced products.
- The process of creating additional values in the stages of production, processing, marketing and selling for rice and vegetable.
- The nurturing method of human resources of the existing agricultural cooperatives for strengthening their operating capacity.

2-1-3 Action Group and Project Site

Action group of this pilot project is the Salgiros cooperative organized by 25 members, located in Laga, Baucau district. The cooperative is officially registered as an agricultural cooperative by National Department of Cooperative, MED. Target area are in the agricultural fields in Laga. Market of Dili and Baucau is regarded as a potential sales area of the farm products, rice and vegetables. Training activities are conducted for Salgueiros cooperative to strengthen their operation capacity in cooperation with the said National Department of Cooperative. As for those training activities, other related farmers' leaders of any similar organization or group and related agribusiness governmental staff should be involved in the training programs.

2-1-4 Action Plan

To attain the target of agribusiness promotion of rice and vegetable produced by the cooperative, project activity is planned to improve present operation manners such as irrigation system, farming, post harvest processing, and marketing; and strengthen operation and management capacity of the cooperative. The main activities taken in the project implementation process consist of the followings.

Action-1: Rehabilitation of the irrigation system

Action-2: Improvement of cropping and marketing technology

Action-3: Technical training for operation and management of the Cooperative

These actions are implemented independently. The Implementation organization is established by each action. The pilot project activities are implemented, monitored and evaluated by each action.

2-2 REHABILITATION OF THE IRRIGATION SYSTEM

2-2-1 Activity and Implementation Organization

(1) Activity

This activity is to rehabilitate the existing irrigation facilities devastated at the time when the Indonesian had withdrew, in order to strengthen the present production infrastructure of cooperative's cultivation

fields. Wells equipped with pump facilities are provided as a supplemental irrigation water source for wet season paddy or dry season vegetable crops. Operation and maintenance organization of the rehabilitated pump facility should be established in the cooperative.

(2) Implementation Organization

Implementing body	: DNPIAC, Baucau district agricultural office
Technical assistance	: Well digging company; well excavation, installation of pumps Baucau district agricultural office (Irrigation & water use management)
Monitoring	: DNPIAC, Baucau district agricultural office (agribusiness department)
Related organization	: DNAH, DNIGUA, Cooperative Department of MED
Target group	: Salgueiros Cooperative (25 members)

2-2-2 PDM, Activity Process and Monitoring

(1) PDM

The PDM was prepared as shown in Table 2-2-2.

(2) Activity process

Activities taken in this study period are summaries as follows.

Activity	Working Progress	Problem	Measure
Site survey	Site investigation, grasp of cooperatives' need for rehabilitation of the well and pump, conduct of groundwater survey in and around the target area were carried out.	Contents of the rehabilitation work requested have often been changed. In addition, related information obtained from interview survey with the cooperative was changed by the interview survey.	Discussion results should be recorded as a memorandum. But, compliance sense of the cooperative is generally low. Then, conducts of survey and interview have often repeated to catch the real situations.
Making consensus for rehabilitation work and Preparation of rehabilitation plan	Discussion meetings or workshops with the cooperative were often held in the following stages such as pre-planning, planning, pre construction, completion of the construction, driving pump, operation and maintenance training of the pump facilities.	Rehabilitation plan of the irrigation facilities is commonly prepared based on the site condition, available budget and future operation and maintenance method including provision of its expenses. However, it was difficult to make consensus among cooperative members since they insisted strongly that large scale of pump should be planned so as to irrigate all of their land, without any future prospect of operation and management activities. They were not aware of who bears pump operation and management cost	In order to help the cooperative members to understand the contents of rehabilitation plan, it is necessary to prepare discussion material from engineering viewpoint according to their understanding level. Then, in the planning workshop, development ideas and method were simply illustrated. It shows schematic pictures of well and pump and irrigating farm land. By using such illustration, it could be deeply discussed each other. In order to get future available amount of pumping water, a pumping test was planned in the open well close to the existing one. The result were put on the planning design of pump capacity and diameter of well.
Bidding for construction	Bidding by 4 companies	The companies to be tendered were selected through introduction of district staff and collected general information on available local construction companies.	In this bidding process, company qualification was evaluated in parallel with the price bidding, since the scale of construction work was small. It is desirable to evaluate it in the

Activity	Working Progress	Problem	Measure
		Some companies could not understand fully the contents of the distributed specification, so that they could not offer reasonable bidding prices in the bidding.	short-list style before bidding the price.
Construction	Construction work has conducted by selected well digging company through the bidding process. The work was the digging wells, installation of engine pumps and construction of pump houses. The works were carried out according to the specification.	In the course of construction works, the cooperative requested to change the type of pumps although it was agreed each other in the planning stage. At that time, all construction work was stopped. (Discussion was held again to confirm the contents of the agreed design. After the confirmation, the construction work was resumed.)	Generally, local farmers have no sense of contract. For similar construction work, in future it will be necessary to make agreement with each other before construction work officially starts. It might be required to stop or cancel the construction work already contracted, if the cooperative would will to do so.
Pump operation for dry season vegetable(*)	Pump facilities were used for irrigation field in about 0.3 ha (112 m long, 21 m wide). Its farm plot was prepared for vegetable cropping. Use of the pump was recorded. It was operated in two times in the morning and evening to irrigate for the planted vegetables. The cooperative has allocated a responsible person for pump operation. He keeps to record the operation fact such as operation hours with on/off time of pump driving, consumed fuel and its purchasing charge, etc.	It is the future problem among pump users to make consensus how to bear pump operation cost. It is the key subject to ensure sustainable pump operation. At present, pump users (neighbor farmers/ women group) are sharing the fuel expenses of pump. Related to this cost sharing of pump operation, it is agreed between the cooperative and the pump users that pump users should pay half of the sales amount of vegetables produced in the pump irrigated farm plot. Therefore, cost-benefit of pumping and sales is the key problem to ensure sustainable use of pump.	In order to make sharing the fuel cost equal among pump users and cooperative, present agreed rate of the sharing based on the sales amount may be reviewed based on the actual balance of the sales and expenses. And, it is necessary to seek any effective measures to increase the sales amount, such as developing any value added vegetable and introducing water saving irrigation.
Operation and management of the pump	As one of regular maintenance work of the engine, exchange of engine oil and greasing are done by appointed cooperative pump operator.	After installation of pump, operation method of the engine was trained to the cooperative in the sites. Easy maintenance work will be done by responsible person of the cooperative, but, special requirement such as repair and exchange of spare-parts should be relied on outside mechanical engineer. For one year guarantee period, the work of repair and exchange of spare-parts can be dealt in by the contractor. However, the cooperative should provide necessary budget for	The cooperative is supposed to prepare maintenance record. Regular check and maintenance activities are recorded. To do so, the cooperative prepared the connection note in which checking items, trouble, repair, contact address when trouble occurred (company, responsible person, address, etc) so that the cooperative can take effective measures when pump troubled. For future operation and management of pump, every cooperative member and pump users

Activity	Working Progress	Problem	Measure
		exchange of spare-parts and repair since the guarantee time.	should know the way of connecting channel when pump troubled.

Note (*): Pump operation for dry season vegetable cropping

Table 2-2-1 Vegetable Cropping and Pumping Process

1. Pump was used for 23 Aug to 22 Nov. Daily operation such as pump driving time (on/ off time), water supply amount, and irrigation area and consumed fuel, was recorded. Out of them, the consumed fuel was compiled as follows.

Pump driving period	Irrigation area (ha)	Consumed fuel (lit)	Fuel cost (US\$)
8/23~8/31	0.3	16.72	16.30
9/1~ 9/30	0.3	25.08	25.00
10/4~10/31	0.3	21.39	23.95
11/01~11/22	0.3	15.12	15.30
Total			80.55

2. Five groups used the pump for vegetable cropping. The area of 0.3 ha was divided for 5 groups. They cropped various vegetables. Produced vegetable were shipped to Baucau market through middleman.

No	Group	No. of farmers	Total farm plots	Sales earning (US\$) (*)
1	Ajony	3	8	152
2	Egidio Filipe	5	32	492
3	Joaquim	2	9	80
4	Olga	3	7	85
5	Sister Alica Gamel	1 group	10	320
	Total			1,124

Note(*): Sales earning is the sales price to the middleman of Baucau. Vegetable cropping of the No.5 group is for home consumption purpose. Sales earning US\$320 was estimated based on the usual vegetable purchasing expenses such as cost of US\$40 per week and two month period 8 weeks US\$320. Cropping vegetables of each group was Morning glory, Water melon, Long-bean, Chinese cabbage, Broccoli, Red onion, Tomato, Mustard, etc.

3. Based on the balance of sales earning and fuel expenses, the groups benefited from the cropping. They could sell them at higher price since they are fresh vegetable in dry season. There are no participants from the cooperative in this dry season cropping. It is necessary to make discussion among the cooperative members whether the cooperative will begin to crop vegetable in the next dry season.



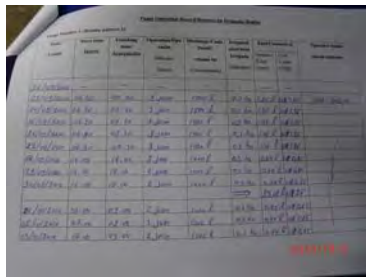
		
Constructed three pump houses (pump and well inside). Pumping capacity: 100-120 lit/mini, groundwater 3-5 m. Operation and maintenance organization was established and pump operator was allocated by the cooperative.	Pumping water is supplied to the vegetable fields of 0.3 ha which are constructed around the pump house. Production was shipped to the Baucau Market through middleman.	Operation hours and consumed fuel were recorded in the daily basis. Fuel expenses were shared among the groups of pump users. They could get benefit through the sales, even sharing pump driving fuel.

Table 2-2-2 PDM for Rehabilitation of the Irrigation System

Project Name: The Pilot Project for Capacity Development of Agricultural Cooperatives

Duration: 1.5 years from January, 2010

Ver. No.2

Target Group and Area: Saiguiros Cooperative and their Agricultural Land

Date: May, 2011

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal</p> <p>Paddy and vegetable cropping area is expanded.</p>	<p>Paddy and vegetable cropping area are increased more than 10% in each than those of the last year.</p>	<p>1) Interview with Saiguiros Cooperative 2) Site observation</p>	
<p>Project Purpose</p> <p>Pumping water is supplied supplementary for rainy season paddy and dry season vegetable cropping.</p>	<p>1) Total more than 300 lit/ min is pumped up from constructed groundwater wells.</p>	<p>1) Pump operation record 2) Interview with pump users on pump operation and cropping 3) Site observation and pumping water measurement</p>	<p>1) Diesel price is not jumped so that pump users can not bear pump operation cost. 2) Ground water level is lowered more than 8 m from ground surface.</p>
<p>Outputs</p> <p>1) Irrigation facilities of well and pump are constructed. 2) Cooperative member team operation and maintenance method of the installed pumps.</p>	<p>1) Well is excavated at three sites. 2) Pump is installed at the excavated wells. 3) Daily operation and maintenance performance is recorded.</p>	<p>1) Site inspection 2) Pumping test 3) Operation and maintenance record</p>	<p>Construction works do not suffer from natural disaster such as flood.</p>
<p>Activities</p> <p>1) Site survey on natural condition, cooperative's needs and contractors 2) Workshop to make consensus from planning to designing 3) Construction of irrigation facilities through bidding process 4) Workshop on operation and maintenance of pump facilities</p>	<p>Study Team Side</p> <p>Facilities</p> <p>1) Drilling well of 3 bore holes 2) Installation of 3 diesel engine pumps 3) Construction of 3 pump houses</p> <p>Personnel</p> <p>1) Planning and design engineers 2) Bidding 3) Training on pump operation</p>	<p>Inputs</p> <p>Local Side</p> <p>Saiguiros Cooperative</p> <p>1) Attend the site survey 2) Attend workshop to make consensus 3) Cooperate construction work (well sites decision) 4) Attend workshop on operation and maintenance of pump 5) Preparation of operation record for bearing diesel expenses</p> <p>MAF in Baucau</p> <p>1) Attend the site survey 2) Attend meeting and workshop on planning and designing 3) Support and advise construction works 4) Attend inspection of constructed works 5) Attend workshop on operation/ maintenance of pumps</p>	<p>Saiguiros Cooperative members break construction works agreed in the workshop and meeting.</p> <p>Preconditions</p> <p>Saiguiros Cooperative continue agribusiness activities.</p>

2-2-3 Final Evaluation

(1) Implementation Organization in the Activity Process

In the implementation plan, it was planned to get technical support on detailed information as for the devastated irrigation facilities which had been constructed in the Indonesian time and any technical standard for rehabilitation work from the district DNIGUA and other related organizations. It was clarified that related data and information for rehabilitation work were not existed in the district agricultural office. Therefore, the above rehabilitation activities were guided by the study team, in cooperation with district DNPIAC.

District staffs of DNPIAC and DNIGUA (irrigation department) were requested to participate in major discussion meetings with the cooperative which the team organized in the implementation process including joint site survey to planning and designing irrigation facilities. District DNPIAC staff participated in the implementation process from the beginning stage of the rehabilitation works. Through such participation, the district staff could learn the rehabilitation process how to proceed from survey to planning and designing. District DNIGUA staff has participated in the beginning stage such as site survey for planning, but, not participated in the next discussions and workshops with the cooperative for planning and designing.

In the workshops for future operation and maintenance of the pumps and bearing its operation cost, District DNPIAC emphasized that support of pump driving fuel from the government did not been expected, therefore, cooperative should bear the fuel expenses. Such workshops were repeated. As the result, the cooperative could create the self-bearing sense.

Vegetable cropping was done by no any technical supports from district agricultural extension staff. It might be necessary to assist the cooperative in operating pump and its maintenance from district offices. District extension workers might be requested to support in cropping vegetable with pump irrigation. Role of the DNPIAC is to cooperate and arrange with those related departments to realize such collaboration. To do so, it would be required to strengthen arrangement capacity of district DNPIAC staff.

(2) Final evaluation

Items	Final evaluation
Validity (Score: 4)	<p>In the Timor-Leste, rice does not reach the self-sufficiency although it is the staple crop. "Food security" is the most important nation's goal. In order to reach the goal, MAF is tackling rehabilitation work to improve existing devastated irrigation facilities. Under such development policy, Irrigation facilities had been rehabilitated with the assistance of JICA in the Manatuto and Maliana where are known as the representative paddy cropping area. But, except the both areas, all most of the agricultural land remains rain-fed area and devastated irrigation facilities.</p> <p>Target area of this action is confronted with unstable irrigation condition, since the existing wells and pumps constructed in the Indonesian era had been removed in the confusion at the independence time. Paddy production became unstable due to no facilities to supply supplemental irrigation water. Rice is the key crop for the cooperative to do the business. Recently, imported rice at cheaper price than the domestic one is marketed widely. Under such conditions, rice business of the cooperative is confronted with management difficulty.</p>

Items	Final evaluation
	<p>Considering such situations, the cooperative needs to restore the removed well and pump to provide irrigation water. Rehabilitation of the well with pump would make supply of irrigation water so stable that the cooperative can produce both the wet season paddy and the dry season vegetables.</p> <p>This action contributes to not only wet season paddy cropping but also dry season vegetable cropping. The action aiming to rehabilitate the devastated facilities is consistent with the needs of cooperative. And it helps the cooperative to strengthen cooperative's business operation/ management capacity. Scale of this action is very small. But, the rehabilitation works in this area surely contribute to the nation's Food Security Policy. Considering these background, validity of this action is considered to be high.</p>
<p>Effectiveness (Score: 3)</p>	<p>Area scale of the dry season irrigation development can not be targeted numerically since the irrigable area is generally depending on the seasonal cropping, applied water management method and planted crops. After wells were excavated and the pumps were installed, small farm plot (0.3 ha) was provided tentatively near the pump station so that it can be irrigated by the pump. Vegetable crops such as morning glory, tomato, water melon and long bean, etc. were planted in the plot. Those crops were growing by using the pump. Farmers/ woman's groups participated in cropping. All of the irrigation water was provided by the pump. The groups shipped the produced vegetables to the Baucau market through the middleman. They got the benefits although pump fuel expenses were shared among the group members, since they could sell at higher prices as fresh ones in the dry season. The groups hope to crop successfully in the next dry season. During vegetable cropping, the cooperative established the operation and maintenance organization. Pump driving was recorded by them.</p> <p>For wet season paddy, rehabilitated pumps were used as supplemental irrigation water supply in the late wet season. Based on the performances through wet and dry season cropping, it could be judged that effectiveness of the rehabilitation of the irrigation facility was verified.</p>
<p>Efficiency (Score: 3)</p>	<p>Type of the pump installed in the Indonesian era was the submerged one. In general, the submerged pump would be too difficult to repair. In this project activity, separated type of suction pump and diesel engine was installed since it is easy to operate and maintain. This pump type decision was made based on the discussion with the cooperative.</p> <p>The cooperative often requested to change the specification such as location, type of pump and depth of well in the implementation stages of planning/ designing and beginning of the construction. Discussions were held to make arrangement at those requested time. Anyhow, as the results, the construction work was completed as scheduled in the contract document. After the completion, amount of pumping water was measured at the constructed three wells. Measurement showed from 100 to 120 lit/min, more than the planned 100 lit/ min. It was conformed that the rehabilitated wells with pumps were used effectively.</p> <p>The cooperative is now operating the installed pump engine. In the operation, it occurred that a driving shaft was broken in a pump engine. Broken one was immediately replaced with that of the other pump engine. Pump users, the cooperative operator used the replaced one. Now it was repaired.</p> <p>Construction cost of one pumping station with well (irrigable area is 0.5 ha) was \$12,593. Annual cost is estimated at \$1,902 based on the assumption; annual repayment for</p>

Items	Final evaluation
	<p>10-year at \$1,259, driving cost at \$563 calculated from the 1) \$429 for wet paddy based on the pumping water 670 m³ and fuel cost \$0.64 per m³ for wet paddy, plus the 2) fuel cost of \$134 for dry season vegetable cropping, and annual operation and maintenance cost \$80 (5% of the engine pump cost). On the other hand, annual benefit is estimated \$2,352 from the profit \$479 for paddy cropping (calculated based on the yield of 3.0 ton/ha) and profit \$1,873 for dry season vegetable. Based on this analysis, its cost-benefit is estimated 1.2.</p>
<p>Impact (Score: 3)</p>	<p>In Timor-Leste, rain-fed paddy field like the targeted area is distributed widely. The farm plot is generally in the slope land. If yield of the paddy and vegetable would be increased through using the constructed pump, the construction work might have an effect on around farmers/ women group and cooperative members. The groups cultivated the dry season vegetables and shipped them to the Baucau market. They could benefit from the cultivation although they bore pump fuel expense. No farmers participated in this dry season vegetable cropping. It shows that some of the cooperative members hesitate to challenge new activity with fuel expenses since the challenging is not clear whether it leads to get benefit or not. Judging from the dry season performance by the groups, it is considered that it may impact on the cooperative's future activity. They may challenge to make home garden for vegetable cropping. Vegetable cropping may be extended to the around area. The pumps were also used for wet season paddy.</p> <p>Size of irrigable area ranges depending on utilization of pumps. Agricultural land in this area is said to be maximum 30 ha, according to the cooperative. Assuming the said area size, according to the EIA guideline (draft prepared by MED), this construction work is classified to the category C which does not require the EIA report. But any possible environmental influence should be monitored. Fluctuation of groundwater around the pump houses was observed. It was not reported so far that no drop of groundwater level occurred in the around open wells.</p> <p>This rehabilitation may cause large impact on dry season's vegetable cropping.</p>
<p>Sustainability (Score: 2)</p>	<p>It was suggested that the cooperative obtains the skills how to operate and manage the installed pump, provides operation and management organization of the pump, and make system to share the consumed fuel expenses among pump users. Discussion workshops with the cooperative were held to discuss the above subjects and encourage them to cope with such operation and management activities. As the discussion results, the cooperative allocated a pump operator. He learned the pump driving skills. In the beginning stage, he was unaccustomed to operation work. After learning, he could obtain the operating skill, and recorded daily pump driving conditions. The expenses of fuel are shared among pump users. It would be possible to sustain the O/M expenses. They got the benefit. It may show they will be able to collect the O/M fee for future coming repair and exchange of spare parts in addition to the fuel expenses. The cooperative has willingness to create self operation and management. Judging from on the on-going O/M activities, it is necessary that district DNPIAC should monitor the cooperative's operation and maintenance activities for long term to judge properly the sustainability.</p>
<p>Total Score: 15</p>	

2-3 IMPROVEMENT OF CROPPING AND MARKETING TECHNOLOGY

2-3-1 Activity and Implementation Organization

(1) Activity

This action is to improve the present skills/ technologies of cropping, processing, shipping and selling of rice and vegetable produced by the cooperative so that the cooperative members can sell them as value added ones. It also brings them more effective operation/ management of their cooperative. Those actions are taken in the implementation progress of the pilot project.

- Technical training for improvement of vegetable cropping

This action aims to improve the quality of vegetables producing in the cooperative's fields so as to promote their sales. As a first, any technical problems in the stages from production to post-harvest processing are clarified through discussion with related experts. Next is taken to seek any measures to cope with those problems. Necessary measures are proposed for the cooperative. And, technical training programs so as to put the proposed measures on their fields are provided and practiced in the project implementation. Provided that any advanced groups/ areas grappling with the similar measures and problems exist in this country, study tours to them are undertaken to learn their experiences and advanced cropping technology.

- Creating additional value of rice by introducing rice grading system and conduct of technical training to cope with it.

Introduction possibility of rice grading system including quality standard and quality grading, and its labeling is studied through discussion with DNPIAC and other related Directorates. This is to help high quality rice to promote its sales. It is also expected to give production incentives to rice cropping farmers. Technical problems to deal with the grading system are discussed with DNPIAC and related Directorates. In the discussion, any solutions are found and clarified among them. Then, to realize those solutions, necessary post-harvest processing technologies are trained and necessary measures are practiced for the cooperative members. Those are conducted as the training programs. If any suitable areas/ groups grappling with those subjects exist in the country, study tours to them are planned to learn their experiences and technologies.

- Technical training for market improvement of produced rice and vegetable

Problems arising in the marketing stages such as packing, shipping and selling are clarified and necessary measures to cope with them are learned and practiced. If any advanced areas/ groups/ traders/ processors grappling with the similar problems exist in the country, study tours to them are undertaken so that the cooperative members can learn from their experiences and skills.

(2) Implementation Organization

Implementing body	:	DNPIAC, Baucau district agricultural office
Technical assistance	:	CDC (Centro do Desenvolvimento Comunitario, NGO): Cropping, Post-harvesting, Marketing, Agricultural extension staff (Baucau district agricultural office)
Monitoring	:	CDC, DNPIAC, Baucau district agricultural office (agribusiness department)
Related organization	:	DNAH, DNIGUA, Baucau district agricultural office
Target group	:	Saigueros Cooperative (25 members), Related farmers groups

2-3-2 PDM, Activity Process and Monitoring

(1) PDM

PDM for this action is prepared in the Table 2-3-1.

(2) Activity Process

Activities taken in the project implementation are summarized as follows.

Activity	Working Progress	Problem	Measure
Workshop on Rice Cultivation (1)	The first workshop was held for the planning of their activities. 15 members of Salgueiros were participated in the workshop.	Salgueiros members did not understand well the components of the Pilot Project. The problems of their rice cultivation did not become clear.	Additional workshop was planned to hold.
Training of Making Natural Compost	The technical training, focusing on making good soil by compost, was conducted by CDC. The members of Salgueiros dug a hole and made natural compost, using the hole.	The attendants of the training complained to the hardness of the digging hole since they did not understand the necessity.	CDC decided to explain the necessity of each work enough. Salgueiros members decided to start work after the understanding of the necessity.
Workshop on Rice Cultivation (2)	The second work shop was held and JICA Study Team and CDC gave supplementary explanation of the Pilot Project to Salgueiros, and conducted the problem analysis of their organization and farming works.	Not all members received enough information on the activities of the Pilot Project. Lack of proper storage equipment for paddy.	To provide necessary information to absentees from the activities. To install silos for their paddy storage.
Training of Making Fertilizer and Insecticide	JICA Study Team introduced the method of making liquid fertilizer and natural insecticide. Salgueiros members learned the making methods and tried to make them.	Salgueiros members could not understand well the effectiveness of the insecticide.	CDC experimented on the insecticide and showed the effectiveness to the members.
Study Tour of Rice Cultivation	8 members of Salgueiros visited at a farmers' group in Venilale Sub-district, Baucau. They shared experience in Integrated Cropping Management (ICM) with 10 members of the farmers' group.	Salgueiros could not find advanced skill in experiment on rice cultivation of the farmers' group.	To select the destination of farmers' group more carefully if Salgueiros plans next study tour of rice cultivation.
Installation of Silos	4 silos of 2.5 m ³ were installed to the workshop of Salgueiros. Those silos are going to start to storage paddy in the next year.	Appropriate space for the installation of the silos was required.	Salgueiros made a warehouse in their workshop for the installation.
Workshop on Vegetable Cultivation	The workshop on vegetable cultivation was held for the planning of the activities. 20 farmers were participated in the workshop.	Most of the members of Salgueiros did not attend the workshop since they were busy with their farming work.	The target farmers of the training of vegetable cultivation were expanded to neighboring farmers of the vegetable garden of Salgueiros.
Training of Vegetable Cultivation	About 25 farmers practiced vegetables cultivation, such as soil preparation, seeding, transplanting, covering and applying compost. The	In the vegetable garden, damage caused by animals was anticipated.	Fences were set around the garden to protect from animals.

Activity	Working Progress	Problem	Measure
	vegetable garden was developed in the field of Salgueilos, where had been installed the irrigation system.		
Workshop on Marketing of Rice and Vegetables	Marketing workshop was held for the planning of their activities. About 15 farmers were participated in the workshop and discussed their selling ways.	Salgueiros members had no idea how to get plastic bags, which had been used for the packing of their rice.	The dealer of the plastic bags in Baucau was identified.
Study Tour of Rice and Vegetables Marketing	10 farmers visited a farmers' group in Aileu for learning vegetables marketing. They also visited two supermarkets in Dili for collecting information on the marketing of their rice and vegetables.	Most of Salgueiros members did not attend the study tour since they were busy with their farming work.	Neighboring farmers who cultivate vegetables in the garden of Salgueiros were also participated in the study tour.
Follow-up for the Vegetable Cultivation	Their trial of vegetable cultivation in the last dry season was reviewed through interviews with the participants of the activity.	The participants did not pay the water fee to Salgueiros against their previous agreement.	Salgueiros removed the vegetable garden at the beginning of the plowing of the rice cultivation in this season.
Training of the Rice Cultivation	Natural compost was applied for 14ha within the total transplanted area of 23.5ha (60%). They did not use chemical materials.	The damage of the mouse's bite is so serious that 4ha was almost destroyed.	Delay of the transplanting is considered the major reason of the mouse's bite.
Study Tour of Rice Cultivation (2)	One member of Salgueiros and three other farmers visited at a farmers' group in Watulari Sub-district, Viqueque. They observed high-yield (10 ton/ha) rice cultivation with 7 villagers.	It is difficult to compare Salgueiros' skill of rice cultivation with the skill of the group in Watulari since natural conditions are different.	The visitors wish to try experimental cultivation in Watulari for the comparison.
Discussion on the Postharvest Processing and the Marketing of Rice	Four members of Salgueiros, CDC staff and the Study Team identified three major problems of the postharvest processing and the marketing. They considered practical countermeasures against the each problem.	<ol style="list-style-type: none"> 1) Procurement of the transparent plastic bags is very troublesome. 2) Arrangement of the vehicle for the transportation is difficult. 3) The performance of their milling machine is not so good. 	<ol style="list-style-type: none"> 1) They aim to entrust the packaging to a supermarket including the procurement of the material. 2) They try to collect information on new transporters in the Sub-district. 3) They try to continue to pay attention to the moisture content of the paddy and the incorporation of foreign matter.

		
<p>Salgueiros dug a big hole for making compost. Bamboo was utilized for the exhausted pipes.</p>	<p>Study tour of rice cultivation was conducted in Venilale Sub-district, Baucau.</p>	<p>Four silos were installed to the workshop of Salgueiros for the storage of their paddy.</p>
		
<p>Palm, plants with prickles and tin plates were applied for fences around the vegetable garden.</p>	<p>Selling plan was discussed in the workshop of rice and vegetables marketing.</p>	<p>Plastic bags for the package of milled rice are able to be obtained through a dealer in Baucau.</p>
		
<p>Salgueiros received a thresher from MED in 2009. It can thresh paddy in 1 ha by 2.5 days.</p>	<p>Plastic sheets are considered to be effective to avoid dew and foreign matter before and after threshing.</p>	<p>A milling machine received from GIZ. They mill 1 ton paddy per day by 2 operators.</p>

Table 2-3-1 PDM for Improvement of Cropping and Marketing Technology

Project Name: Strengthening Cropping and Marketing Technology of the Cooperative

Target Group: Salgueiros, agricultural cooperative in Laga, Baucau

Duration: 1.5 years from February 2010

Ver. 1

Date: October 2010

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal</p> <p>The sales volume of Salgueiros will be increased.</p>	<p>The sales volume of Salgueiros will be increased more than 10 % in comparison with that in the last year.</p>	<p>The sales record of Salgueiros</p>	
<p>Project Purpose</p> <p>Salgueiros's skills of cultivation and marketing are improved.</p>	<p>1) The productivity of land is increased more than 10 % as compared with that in the last year. 2) The number of shipping destination is increased.</p>	<p>1) The interview with some members of Salgueiros 2) The shipping record of Salgueiros</p>	<p>The condition of rice/vegetables market is not changed significantly.</p>
<p>Outputs</p> <p>1) The members learn new rice cropping and post-harvest processing skills. 2) The members learn new cropping skill of vegetables. 3) The members learn new marketing skills of the produced rice and vegetables such as packaging, transportation and selling.</p>	<p>1) The members apply the new rice cropping and post-harvest processing skills. 2) The members apply the new cropping skills of vegetables. 3) The members apply the new marketing skills of the produced rice and vegetables.</p>	<p>1) Monitoring their paddy fields and post-harvest processing 2) Monitoring their vegetable garden 3) Monitoring their marketing way</p>	<p>Natural disaster do not affect their activities seriously.</p>
<p>Activities</p> <p>1) Training of rice cultivation 1-1) Making of organic fertilizer and pesticide and applying them to the paddy fields 1-2) Study tour for observation on excellent practice of rice cultivation 2) Training of vegetables cultivation 2-1) Making of organic fertilizer and pesticide and applying them to the vegetables fields 2-2) Installation of fences to the fields for protection from animals 2-3) Study tour for observation on excellent practice of vegetables cultivation 3) Training of marketing skills 3-1) Improvement of the packaging 3-2) Improvement of the transportation of the produce 3-3) Development of shipping destinations</p>	<p>Study Team Side</p> <p>Personnel</p> <p>1) Experts on paddy cultivation 2) Experts on vegetables cultivation 3) Experts on marketing/storage of rice 4) Experts on marketing/storage of vegetables 5) JICA Agribusiness Study Team</p> <p>Provision of Machinery and Equipment</p> <p>1) Materials of microorganism 2) Tanks of multiplication 3) Materials of vegetables cultivation 4) Training materials of marketing and storage</p>	<p>Local Side</p> <p>Personnel</p> <p>1) Members of Salgueiros 2) Excellent farmers for the study tours 3) Agricultural extension officers in Baucau 4) MAF staffs in Baucau 5) MAF staffs in Dili</p> <p>Building and Facilities</p> <p>1) A meeting hall of Salgueiros 2) Paddy and vegetables fields of Salgueiros</p>	<p>The attendants of the training do not leave Salgueiros.</p> <p>Preconditions</p> <p>Agribusiness policies of MAF are not changed significantly.</p>

2-3-3 Final Evaluation

(1) Implementation organization in the activity process

A. Ministry of Agriculture and Fisheries

MAF, Agribusiness Department in Baucau Office has taken an active role in supporting the activities. It directly assisted the pilot by (i) advising in the meetings and the workshops, (ii) informing the director of sub-district office and the suco chief about the Pilot Project, and (iii) monitoring the activities with the JICA Study Team. Also, agricultural extension official in the suco have assisted well the Project. He provided useful farming skills in the cropping trainings in collaboration with the CDC.

B. Centro do Desenvolvimento Comunitario (CDC)

CDC is a Baucau based independent non-profit NGO. Its mission is to assist rural communities to produce and market local produce. CDC is active in the planning, implementation, marketing and monitoring of agriculture projects. They have conducted the projects of farmers' cooperative, blacksmith and "one village one product" with donors to date. The Pilot Project is run by an Administrative Coordinator, a Program Coordinator and 3 field staffs of CDC

In this Pilot Project, the relationship between the target farmers' cooperative and CDC was not going well though CDC struggle to establish reliable relation. One reason of the difficulty is considered that they did not communicate enough with each other. CDC has a good experience in supporting a farmers' cooperative, which began from organizing the cooperative so that they could share the purpose of the activities, based on their enough understanding. But in this Project, CDC had to start the training with the existing farmers' cooperative which had no experience in working with CDC.

C. Salgueiros

The target farmers' cooperative is "Salgueiros" in Laga, Baucau, which was officially registered by the National Directorate of Cooperatives, Ministry of Economic Development in 2008. Salgueiros members are 25 but 10 members are not active since they changed main job from farming to others. They cultivates paddy, mills them, packages rice and sells them to some dealers in Baucau and Dili. The board of directors are consists of 13 members; a president, a vice-president, a secretary, a treasurer, 3 auditors and 6 directors¹. The president is Mr. Alberto da Costa. In the last season, they produced 16 ton of rice (IR64) and sold them by \$1.0/kg to three supermarkets in Dili and five dealers in Baucau. In this year, they plan to sell their produced rice (IR64, Nakroma) of 22 ton. The number of the selling supermarkets in Dili is also planed to be increased to five.

(2) Final Evaluation

Items	Final Evaluation
Validity (Score: 4)	Rice farmers who have capacity to produce surplus rice do not cultivate it so much in general, exceeding the amount of their self-consumption. The main reason of the shortage of their motivation for surplus production is considered that there is not enough market of rice in rice-producing region since most farmers cultivate rice. However, there is a big market of rice in Dili, and other major towns like Baucau have middle rice market. Hence, if rural farmers can bring their surplus rice to those towns, they can sell them,

¹ Each director is in charge of each department; Administration, Agriculture, Commerce, Fishery, Construction and Handicraft but the last three departments are not yet active.

Items	Final Evaluation
	<p>which enhances farmers' motivation for surplus cultivation and increase their income. Rural farmers can sell their produce even in near marketplaces indeed but they have to pay the costs of transportation and selling, which are comparatively high because the scale of those marketplaces is small. It is required to ship large amount of rice to big-scale markets to reduce the unit costs. General farmers have not so much capacity to produce large amount of surplus rice. Then, the members of Salgueiros try to get together their capacity of rice production and sell their produce in the town markets.</p> <p>The cooperative is selling the produced rice to supermarkets in Dili by the price of \$1.0/kg. The cooperative members tackle about expanding to sell it to the other supermarkets to make the cooperative's operation and management activities more stable. However, the cooperative is confronted with difficult situation on sales expansion since imported good-quality rice is nation-widely distributed. In addition, government products purchasing system is buying paddy from rice producing farmers without provision of quality standard. This paddy buying system causes negative impact to devoted rice producing farmers. They seem to be weakened their own incentive to improve cropping, post-harvesting and marketing activities aiming to produce value added high quality rice. Under such conditions, the cooperative also challenged to deal in vegetables in addition to the rice, aiming to make the cooperative's agribusiness base strong. This action in the pilot project is consistent with such cooperative's needs. Work scale of this action is small and limited to the cooperative. But, this agribusiness approach is consistent with the concept of "Food Security" policy. Then, validity of this action is judged to be high.</p>
Effectiveness (Score: 4)	<p>The Pilot has demonstrated the effect of natural fertilizer and insecticide to boost their production. The farmers who attended the training already recognized the efficacy in the vegetable cultivation. The new skill of natural compost was applied to 60 % of paddy fields in 2011.</p> <p>The importance of the post-harvesting was recognized well by the members through the training of the Pilot. If they will succeed to improve the quality of the produced rice, they can expect to enjoy higher selling price. The problem to be solved to improve the quality is how to reduce the ratio of foreign matter and broken rice. As the counter measures, firstly, they have to continue to pay attention to remove sand, immature paddy, weed's seed, etc. in the sorting work. Secondly, they have to dry paddy appropriately in the drying work, which leads to reduce broken rice. Thirdly, covering paddy by plastic sheets is considered to be effective to avoid the incorporation of foreign matter and dew.</p> <p>As for the marketing, they identified current crucial problems; 1) the outlook for procurement of the plastic bags of the packaging material is still vague, and 2) the arrangement of the transportation of their produced rice is difficult.</p> <p>In Baucau, they have found out a dealer of the plastic bags, which are transparent and information about the commodity is printed on. However, the number of the cooperative's order to the dealer, who will order them to a maker in Surabaya in Indonesia, is less than the minimum quantity. Then, they are trying to obtain the cooperation of a supermarket in Dili, who offered to package the produced rice including the procurement of the plastic bags. Now, Salgueiros is preparing a sample of produced rice, which will be tested by the supermarket. If their rice will be approved, it is going to be purchased by the supermarket at \$1.0/kg, packaged by transparent plastic bags and sold in the supermarket.</p> <p>The transportation of the produced rice is used small vehicles. The fares are \$80 /time from Laga to Dili and \$20/time from Laga to Baucau, which convey about one ton at a time. Salgueiros uses three transporters but it is difficult to arrange for a small vehicle in</p>

Items	Final Evaluation
	<p>accordance with the plan of the shipment these days. So, they plan to collect more information on other transporters in the sub-district.</p> <p>Their sales style used to be basically passive since production amount was not so big so far that the sale was comparatively easy. So, they waited for order from a dealer, who contacted Salgueiros when the stock was sold out. However, in order to increase the sales, they need to make more preferable selling conditions as well as increase of their production. It is considered that adding the shipping destination provides them with new options of the selling channels and conditions. It is considered that they learned the positive marketing through the activities in the Pilot. In this season, they plan to sell their rice to five supermarkets in Dili, adding two supermarkets. Especially, the new challenge of the cooperation on the packaging with a supermarket shows a change of their attitude on the marketing.</p> <p>Their unit yield in this season is estimated 2.3 ton/ha tentatively, which is 115 % of the lasts season's unit yield, 2.0 ton/ha though those results are considered to be mainly effected by the climate conditions.</p>
<p>Efficiency (Score: 2)</p>	<p>As for the training of making natural fertilizer and pesticide, the members applied those learned skills to their fields indeed. Also, we can expect that they will continue to use the installed silos properly since they keep them nicely in the warehouse which they built by themselves. On the other hand, we could see the efficiency of the training of vegetables cultivation in their vegetable garden, where vegetables cultivation was active, using the introduced skills. We can expect the extension of vegetables cropping to their individual kitchen gardens.</p> <p>Also, new marketing skills are utilized in their sales activities. Two key points were cleared through the review of their selling way; 1) the plastic bags for rice-package, which is transparent and able to provide actual commodity information to consumers, have strong advantages in the marketing, 2) the increase of shipping destinations enhances their power of the negotiation with dealers, which may lead to improve the marketing methods. The inputs which installed in the Pilot have been fully utilized in the activities. However, the efficiency of the Pilot was lower than the expectation due to the shortage of participation of the cooperative's members. Their activities were usually conducted by less than a half of the directors, and ordinary members were not active.</p>
<p>Impact (Score: 2)</p>	<p>The Pilot's positive and intended impact to increase sales volume of Salgueiros is in the correct direction. If their skills of cultivation and marketing are improved and the market conditions of rice and vegetables are not changed significantly, the sales volume will be increased, which will lead to a business model of agricultural cooperatives. In this season, the sales volume of produced rice is expected about 22 ton, which is 138 % of the sales amount in 2009 though the final results of the marketing training will be shown in the latter half of this year through the practice of the sales activities of their produce.</p> <p>Voices of expectation or interest in farmers' cooperatives are heard in many places. According to some leaders in rural areas where we are operating the Pilot Projects, a lot of farmers are interested in farmers' cooperatives but they have no idea on actual activities at all. Therefore, it is considered that establishment of a business model by a farmers' cooperative gives a big positive impact to the whole country.</p> <p>An unintended negative consequence is that the activities of the Pilot caused bad terms between active members and inactive members. The board of directors of Salgueiros</p>

Items	Final Evaluation
	consists of 13 members but their activities tend to be carried out by less than a half of them, which made other inactive directors and ordinary members have a sense of alienation. They came to consider that the object of the Pilot is not the ordinary members but the president and his close members only, which caused their sense of distrust, envy and indifference to the activities of the Pilot.
Sustainability (Score: 3)	Sustainability will depend on establishment of economically viable cooperative operations. The measures of increasing their sales were cleared but the way to mobilize the members to the cooperative work is not found. Usually increase of profit through a cooperative's activities raises the solidarity of the members and leads them to development. However, such positive impact is based on the fundamental system of cooperative's organization, whose all members work together and share the benefit. If Salgueiros cannot rebuild the cooperative formation, increase of benefit is capable of causing the split of the organization. Through the discussion of the members, it was confirmed that a matter of high concern of the members who were not interested in the Pilot's activities was money. Therefore, setting an appealing and simple target in their sales activities, which is able to increase their cash income, is considered to be effective in getting their participation in the cooperative works.
Total Score: 15	

Profit Analysis of the Cooperative Shipment of Rice

If the cooperative try to sell the produced rice in the local markets, it needs higher cost in comparison with the cost of the shipment to Dili and Baucau. Salgueiros can gain the difference between the marketing cost of the "Selling in the local market" and the "shipment to the town markets" as profit by the selection of the markets. The difference of \$ 5,265 is 73 % of the marketing cost of "Selling in the local market". The sales, the cost and the profit of the each business are summarized in the following table.

Table 2-3-2 Cost Benefit Analysis of Rice in the Local Market

	Selling to Local Market	Selling to Town Market
Sales:	Estimated sales amount in this year: 22 ton Unit sales price to consumers: 25 ¢ /250g 22,000kg×1\$/kg = \$22,000	Estimated sales amount in this year: 22 ton Unit sales price to stores: 1 \$/kg 22,000kg×1\$/kg = \$22,000
Production Cost*:	Total: \$618 + \$561 + \$1,952 = \$3,131 (Explanation of estimating Production Cost is mentioned below)	
Marketing Cost:	Local marketplaces: 2 places Estimated unit sales amount: 40kg/day/place Unit sales amount: 2places×40kg/day/place = 80kg/day Selling days: 22,000kg/80kg/day = 275days Unit selling workers: 2 workers/place Total workers: 2places×2workers/place×275days = 1,100workers·day Wage of worker: 4.5\$/worker·day Wage amount: 1,100workers·day×4.5\$/worker·day = \$4,950 Fuel of motorbike: 1.5 lit/worker·day Fuel cost: 1,100workers·day×1.5lit/worker·day×1.4\$/lit = \$2,310 Total: \$4,950 + \$2,310 = \$7,260	Packaging weight: 10 kg/bag Number of bags: 22,000kg/10kg/bag = 2,200bags Packaging material: 2,200bags×0.1\$/bag = \$220 Unit packaging number: 100bags/worker·day Wage of worker: 4.5\$/worker·day Wage for packaging: 2,200bags/100bags/worker·day×4.5\$/worker·day = \$99 Shipment plan to Dili: 22,000kg×75% = 16,500kg Shipment plan to Baucau: 22,000kg×25% = 5,500kg Transport volume: 1 ton/time Unit cost of small vehicle to Dili: 80 \$/time Unit cost of small vehicle to Baucau: 18 \$/time Cost of small vehicle: 17times×80\$/time + 6times×18\$/time = \$1,468 Unit worker of transportation: 1worker·day/time Wage for transportation: (17times+6times)×4.5\$ = \$104 Unit worker of arrangement: 1worker·day/time Wage for arrangement: (17times+6times)×4.5\$ = \$104 Total cost: \$220 + \$99 + \$1,468 + \$104 + \$104 = \$1,995
Total Cost:	\$3,131 + \$7,260 = \$10,391	\$3,131 + \$1,995 = \$5,126
Profit:	\$22,000 - \$10,391 = \$11,609	\$22,000 - \$5,126 = \$16,874

* Production Cost is estimated as following.

(1) **Plowing cost: 25ha/0.4ha/day×5\$/lit×1.4+\$180 = \$618**

Plowing area: 25 ha, Unit plowing area: 0.4 ha/day, Fuel of a tractor: 5 lit/day, Fuel unit price: 1.4 \$/lit, Maintenance of a tractor: 180 \$/year

(2) **Threshing cost: 23.5ha×2.5days/ha×5lit/day×1.4\$/lit+\$150 = \$561**

Harvesting area: 23.5 ha, Unit threshing time: 2.5 days/ha, Fuel of a thresher: 5 lit/day, Maintenance of a thresher: 150 \$/year

(3) **Milling cost: \$980 + \$972 = \$1,952**

Amount of paddy: 54 ton, Unit milling amount: 1 ton/day, Fuel of a milling machine: 9 lit/day, Maintenance of a milling machine: 300 \$/year,

Cost of a milling machine: 54ton/1ton/day×9lit/day×1.4lit/\$+300\$ = 980\$

Total Production Cost = (1)+(2)+(3) = \$618 + \$561 + \$1,952 = \$3,131

* The labor fee of the production is paid by paddy, which is one third of the production.

2-4 TECHNICAL TRAINING FOR STRENGTHENING OPERATION AND MANAGEMENT

2-4-1 Activity and Implementation Organization

(1) Activity

It is necessary for cooperative members to learn operation and management technologies so as to make their agribusiness activities effective and sustainable. In this action plan, training programs provide any learning opportunities for them. Training is conducted as group training. Subjects are the related to development, operation and management of the agribusiness. Participants are the cooperative members, farmers groups/ women groups and NGOs, and DNPIAC staff. Subjects to be learned are how to operate and manage agribusiness activity and cooperatives.

(2) Implementation Organization

Implementing body	: DNPIAC, Baucau district agricultural office
Technical assistance	: Cooperativa Esperanca, NGO: Execution of training program, National Cooperative Department, MED: Introduction of cooperatives
Monitoring	: Cooperativa Esperanca, DNPIAC, Baucau district agricultural office (agribusiness department)
Related organization	: DNPIAC, MED
Target group	: Saiguiros Cooperative (8 persons), Related farmers groups, women groups, NGOs (11persons), DNPIAC staff (6 persons)

2-4-2 PDM, Activity Process and Monitoring

(1) PDM

PDM for this action is prepared in the Table 2-4-1.

(2) Activity Process

Activities taken in the project implementation are summaries as follows.

Activity	Working Progress	Problem	Measure
Lectures and Practicum on Basic Agricultural Cooperative Management	3 days were dedicated to training in basic cooperative management. Each day included 2 lectures followed by a practice session. Approximately 70% of time was used for practicum, where work groups applied the lecture knowledge. Topics covered included; (i) basic cooperative philosophy and principles, (ii) organizational structure, (iii) regulations and legal environment, (iv) by-laws, (v) rights and duties of management and members, and (vi) cooperative establishment.	The participants were of widely differing educational back-grounds and experience levels, and so absorbed the materials at very different rates.	Esperanca repeated difficult topics several times, monitored care-fully participant progress and grouped participants by skill level during the practicum sessions. This allowed trainers to spend extra time with slow groups, while not frustrating the quick learners. A field visit was made to reinforce classroom learning
Lectures and Practicum on Agricultural Cooperative Financial Management	Financial management training covered 2 days with the same pattern as above (i.e., 70% time practicum). Topics covered included; (i) appropriate bookkeeping, (ii) basic	About 60% of the participants had weak mathematics back-grounds, and no experience with either bookkeeping	Esperanca taught basic accounting techniques, repeated ac-counting topics several times and monitored carefully student progress. As above, participants were

Activity	Working Progress	Problem	Measure
	accounting, and (iii) auditing systems.	or ac-counting.	grouped by skill levels.
Lectures and Practicum on Agricultural Cooperative Administrative Support	1 day was spent for training in administrative support with the same pattern as above (i.e., 70% time practicum). Topics covered included; (i) registrations/filings, (ii) official minute book documentation, and (iii) government support resources.	Except for MAF staff, almost all participants lacked knowledge about legal structures and the related documentary needs, plus they had no experience working with government institutions.	During the practicum, participants were grouped by skill level; and Esperanca worked directly with the less experienced participants. MAF and Cooperatives Directorate explained the basics of government organization and how cooperatives could access its support.
Lectures and Practicum on Agribusiness Concepts	Agribusiness concepts were covered in 1 day with the same pattern as above (i.e., 70% time practicum). Topics included; (i) sector overview, (ii) profiles of typical enterprises, and (iii) potential for Timor-Leste.	About 50% of the participants had no previous exposure to commercial agribusiness.	Esperanca and MAF, Agribusiness provided examples of Timor-Leste agribusinesses such as coffee, seaweed and irrigated rice. Esperanca lead directed group discussions and a field trip.
Lectures and Practicum on Seeking Opportunities in the Agribusiness Sector	1 day was dedicated to training in seeking opportunities in the agribusiness sector with the same pattern as above (i.e., 70% time practicum). The main topic covered was how to collect and use agribusiness information.	80% of the participants had no business experience and had difficulty identifying potential problem areas.	Esperanca allocated extra time to explaining entrepreneurship and business topics. During the field trip the participants meet with business minded producers.
Lectures and Practicum on Value Chain and Stakeholder Analysis	Value Chain and Stakeholder Analysis were covered in one day with the same pattern as above (i.e., 70% time practicum). Topics included; (i) meaning of value chain analysis, (ii) presentation of sample value chains, (iii) SWOT analysis, (iv) stake-holder appraisal.	Value chain and SWOT analysis were new topics for all the participants.	Additional practicum time in the evenings was provided to allow for practice with value chain and SWOT analysis.
Lectures and Practicum on Understanding and Making Business Plans	3 days were spent making business plans. About 70% time was used for practicum. Topics covered included; (i) determination of activities, inputs and outputs, (ii) use of indicators, (iii) cost-benefit analysis, (iv) cash flow, and (v) operating plans.	About 60% of the participants had weak mathematics back-grounds, and no business or accounting experience.	Esperanca corrected the work groups' business plans, and then reviewed and explained deficiencies to the participants.

		
<p>Esperanca's Team Leader with MAF and Cooperatives (Baucau and National) representatives at opening ceremony.</p>	<p>Esperanca instructor leading a classroom discussion about cooperative management.</p>	<p>Participants at a MAF exhibition of local agribusiness products in Baucau.</p>
		
<p>Participants engaged in group training exercises about cooperative organizational structure.</p>	<p>Participants making a business plan for the Salgueiros Cooperative in Laga.</p>	<p>NGO Alola Foundation participant engaged in a SWOT analysis exercise.</p>

Table 2-4-1 PDM for Technical Training for Strengthening Operation and Management Capacity of the Cooperative

Project Name: Technical Training for Operation and Management of Agricultural Cooperatives

Ver. 3

Duration: 1 Month - October 2010

Target Group: Agricultural Cooperatives in Baucau, Viqueque, Aileu, Manufáhi, Ainaro and Bobonaro

Date: November 2010

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal</p> <p>The cooperatives will improve management of their internal operations and conduct their agribusiness activities in a more professional manner.</p>	<p>The cooperatives will improve their cooperative's operations; and start agribusiness activities in accordance with business plans.</p>	<p>MAF, Cooperatives Directorate and JICA Study Team follow up with monitoring of cooperatives' activities.</p>	
<p>Project Purpose</p> <p>Management capacity of the trained cooperatives is strengthened for both their own internal operations and for their agribusiness activities.</p>	<p>1) Organization charts with duties are available in trained cooperatives; 2) Minute books with meeting notes available in trained cooperatives; 3) Proper bookkeeping is in place in the trained cooperatives; 4) Business plans are being made by the trained cooperatives.</p>	<p>1) Inspection of trained cooperatives' organization charts, minutes of meetings and account books 2) Review of trained cooperatives' business plans</p>	<p>The trained personnel are given authority and resources to apply their skills.</p>
<p>Outputs</p> <p>1) The trained staff with knowledge of the general principals of agricultural cooperative legal structure, organization and management. 3) Trained staff with knowledge in accounting and bookkeeping. 2) The trained staff with knowledge of basic agribusiness practices, including value chain, stakeholder and opportunity analysis and making of business plans</p>	<p>1) Trained cooperatives are managed in accordance with the staff's newly acquired training knowledge. 2) Trained cooperatives produce proper accounting reports; 3) Trained cooperatives have agribusiness plans made by applying the staff's knowledge acquired the training.</p>	<p>1) MAF, Min. Economic Development Cooperatives Directorate and JICA Study Team visits to trained cooperatives to observe document-ation, procedures and operations. 2) MAF, Min. Economic Development, Cooperatives Directorate and JICA Study Team analysis of trained cooperatives' business plans.</p>	<p>The trained personnel are given authority and resources to apply their skills. Cooperative have sufficient interest and resources to warrant examination of the agribusiness opportunities.</p>
<p>Activities</p> <p>1) Lectures and practicum on agricultural cooperative management</p> <p>1-1) Basic management 1-2) Financial management 1-3) Administrative support</p> <p>2) Lectures and practicum on agribusiness applied to agricultural cooperatives</p> <p>2-1) Agribusiness concepts 2-2) Seeking opportunities in the agribusiness sector 2-3) Value chain and stakeholder analysis 2-4) Understanding and making business plans</p>	<p>Study Team Side</p> <p>Personnel</p> <p>1) Facilitators 2) Facilitators' Support Staff 3) Administrative Staff 4) Documentation Staff</p> <p>Provision of Machinery and Equipment</p> <p>1) Accommodation 2) Transportation 3) Training Materials</p>	<p>Local Side</p> <p>Personnel</p> <p>1) Members of agricultural cooperatives 2) MAF Agribusiness staff 3) Min.of Economic Development, Cooperatives Directorate staff</p> <p>Building and Facilities</p> <p>1) Rented conference room</p>	<p>The trained personnel are able to transfer skills and do not change employment.</p> <p>Preconditions</p> <p>Agribusiness policies of MAF are not changed significantly.</p>

2-4-3 Final Evaluation

(1) Implementation organization in the activity process

A. Ministry of Agriculture and Fisheries

MAF, Agribusiness Department has supported this pilot through participation of its staff. In total, MAF sent 6 people for 2 weeks to attend the training session. These included participants from Dili, Baucau (2), Lautem, Bobonaro and Oecussi. These staff attended the entire 2 week training session, and served as resource persons. They were very helpful explaining government institutions and their related agribusiness support programs. Of the MAF participants, one third are women. MAF, Agribusiness has demonstrated its interest in the pilot through its commitment of so many staff for such a long period of time. As a result, it now has 6 trained staff. MAF is, therefore, well positioned to continue its support to cooperatives especially for agribusiness development.

B. Ministry of Economic Development, Cooperatives Directorate

The Ministry of Economic Development, Cooperatives Directorate provided an instructor for the training session. He conducted 2 lectures on a range of topics related to cooperative development and management. The Cooperatives Directorate staff attended the entire 2 week training session, and served as resource person throughout. He provided an overview of cooperative activities in the agribusiness sector. The Cooperatives Directorate appears to have the skills, interest and resources to work together with MAF to build up the agricultural cooperative movement.

C. Cooperativa Esperanca

Cooperativa Esperanca (Esperanca) is a Dili based, independent, non-profit NGO. According to JICA Study Team and MAF assessments, their performance is rated as very good. It is recommended that Esperanca be considered as an executing agency for similar future projects.

Esperanca's office is located in Dili, and is equipped with computers and basic office equipment. Its mission is to serve the cooperative movement, especially to develop savings and loan cooperatives. The NGO was founded in February 2009, is an active member of the East Timor Credit Union and is presently engaged in the process of formal registration at the Ministry of Justice. Esperanca is run by a manager and employs several office staff. It has implemented projects for a range of clients including the Timor-Leste Government, USAID, and NGOs such as Belun, ETADep, USC (Canada) and Paz y Desarrollo (Spain). Esperanca's management has proven itself technically competent, motivated and professional. Its staffs have shown themselves to be very good encouraging and motivating participants, as well as, effectively conveying the learning materials.

(2) Final Evaluation

Items	Final Evaluation
Validity (Score: 4)	Salgueiros Agriculture Cooperative registered by Cooperative Directorate of MED is the only cooperative who has actual performance in the agricultural cropping fields. The cooperative's agribusiness activity is dealing in rice. The activity covers from production, post-harvest processing to marketing. Those activities are the agribusiness management base for the cooperative. But, the cooperative's management capacity is weakening since

Items	Final Evaluation
	<p>government purchasing system is buying paddy at fixed price and imported cheaper rice is marketed widely. Under such background, the cooperative is required to improve their management capacity. To do so, the cooperative is required to seek profitable crops and activates the cooperative's agribusiness collaboration of the crops. The cooperative also needs to learn the lessons how to operate and manage their own organization through such agribusiness promotion. It is the responsibility of the Cooperative Directorate to strengthen the cooperative's operation and management capacity. This technical training to learn the subjects on cooperative and agribusiness promotion was provided for cooperative members and related agribusiness stakeholders. Participants was the persons from the Salgueiros Agriculture Cooperative, MAF agribusiness staff and other related farmers group aiming to organize their group into cooperative. They learned the significance of organizing cooperative and the lessons how to promote agribusiness. Provision of training opportunity like this is consistent with the improvement needs of existing cooperative, farmers groups and DIPIAC staff. This meets with requirement of Cooperative Directorate, MED. It is judged that validity of this training is high.</p>
<p>Effectiveness (Score: 4)</p>	<p>The overall development of the cooperative and agribusiness sectors is a long term endeavor. Consequently, the Pilot will require an implementation period of at least 3 years before its effectiveness in improving the trained cooperatives can be assessed. However, the Pilot's cooperative trainees can have an immediate and positive impact. Of the Pilot's 25 total trainees, 44% (11 participants) were from 3 different cooperatives including 32% (8 participants) from Cooperativa Salgueiros. Community NGOs participants constituted 32% (8 participants) of the trainees. The cooperative and NGO participants can immediately begin to apply their skills in areas such as accounting, bookkeeping, formal registrations/filings, legal structures, and institutional organization.</p>
<p>Efficiency (Score: 3)</p>	<p>The provision of training services by Esperanca as well as the MAF and Cooperatives Directorate were above expectations. All the key topics were covered, and well understood by most participants. The Pilot was implemented on schedule. The training was conducted in a very cost effective manner. The total Pilot cost including all transportation, accommodation, food, teaching fees, and training materials services and materials is estimated at \$15,000. The training included 25 participants for a 12 day period. Thus, the cost per trainee/day was \$50. Considering the cost included not only the class but also travel, accommodations and food, this price is very reasonable. Expectation is that the 3 cooperatives and 7 NGOs trained will immediately improve their daily operations of their respective organizations and provide increased benefits to their approximately 250 members. Other indirect benefits from the cooperative training will accrue gradually over 5 years. These are expected to include development of a total of 13 new agribusinesses (2 each at 3 cooperatives and 1 each at 7 NGOs). Their business skills were improved; accounting, bookkeeping, formal registrations/filings, legal structures, and institutional organization.</p>
<p>Impact (Score: 3)</p>	<p>The Pilot's positive and intended impacts to develop, manage and operate a cooperative and also how to identify and support agribusinesses are described in "Effectiveness" above. Unintended positive impacts include; (i) model for joint training implementation by MAF and Cooperatives Directorate, (ii) increased motivation by MAF staff to assist with cooperatives development, (iii) information exchange by MAF District, Agribusiness officers, and (iv) application of the skills in non cooperative endeavors. An unintended negative consequence is that it is difficult to show actual cooperative</p>

Items	Final Evaluation
	activities in accordance with the expectation of the attendants of the trainings because well operated cooperative activities are still rare. MAF and/or the participants may try to overzealously apply their skills in advance of farmers' needs or wishes.
Sustainability (Score: 2)	Sustainability will depend on the establishment of viable cooperatives with strong agribusiness operations. To date the record of Timor-Leste cooperatives has been mixed. A few such as savings and loan credit cooperatives and the seaweed cooperative have done well, while most have languished. The participants now have the requisite skills. However, these skills will need to be coupled with the cooperatives' willingness to utilize their trained staff and apply the needed resources. Continuing support in cooperative operations would be advisable. Though sustainability will only be fully known through monitoring across a 5 year period, at the present time, it is judged to be low because the cooperative activities through the utilization of the learned knowledge and skills are not established yet.
Total Score: 16	

2-5 EVALUATION OF THE VERIFICATION THEME

(1) The Method of Administrative Support by MAF in Improving the Operation from Production to Selling of Cooperative's Produced Products

Government policy is primary put on the self-sufficiency of rice. Based on this, MAF is promoting the rehabilitation project to improve the rice production infrastructure. Large scale irrigation rehabilitation projects in Maliana and Manatuto has been completed with the assistance of JICA. However, for small and medium scale projects, there is no rehabilitation plan. There exist many sloped and small plot lands like in the Cooperative in this country. It is desirable that MAF provides rehabilitation plan for such farm lands. MAF is supplying agricultural inputs such as machine and fuel to the rice production farmers who apply the ICM farming method recommended by MAF. Seed is also provided by MAF in the cooperation with Seed of Life program. Under this condition, the Cooperative gets the rice seed from MAF. There is no government policy aiming to promote vegetable cultivation.

At present the government purchasing system is executed. MTCI is the responsible for the system operation. Purchased products and its purchasing price are decided through the governmental discussion involved related ministries such as MAF, MTCI and MOF. (Purchasing products in June 2010 are paddy, maize, mung bean, red bean and soybean.) Many problems in operating the system are pointed out. Therefore, production farmers not always ship all of their products to the purchasing system. However, price of the products is primarily set by government. As the result, the system affects business operation of the processing and marketing industries/ groups such as middleman, trader, rice miller, processors and retailers. In the system, rice is purchased in paddy. No quality standard is applied at the purchasing time.

The Cooperative does not utilize the government purchasing system, ships the milled rice to the supermarket in Dili. Objective of this shipping is to sell their produced high quality rice at higher price than the government purchasing price. The pilot project supported the cooperative's challenge. By receiving the technical support, the cooperative become to get a certain benefit. As for rice quality in the marketing system, if government would introduce a kind of rice quality standard, shipping and selling price could be set based on their standard. If such quality standard would be put on the rice

market, rice production farmers would become to try to improve their production system. As the result, rice production is expected to increase. There is presently no policy which supports rice cultivation farmers who aim to improve quality of rice in their production and post-harvest processing system.

It is important for MAF to provide an effective policy which can give an incentive for improving rice production activity to the farmers, aiming at increasing rice production.

(2) The Process of Creating Additional Values in the Stages of Production, Processing, Marketing and Selling for Rice and Vegetable

The following subjects required in the stages of production, processing, marketing and selling of rice and vegetable produced by cooperatives were verified through this pilot project implementation.

Production: Making good soil, applying compost, is fundamental way to increase the quality of rice and vegetables. In addition to making soil, the countermeasures of harmful insect and disease are required, such as chinch bug and blight, which spoil the grain and the fruits and cause broken rice and immature fruits. As for selection of rice variety, red-rice seems to have high potential of sales. It is not widely cultivated yet but the transactional price is higher than other varieties since the taste is evaluated higher. Regarding the varieties of vegetables, it was confirmed that ordinary vegetables in rural areas, such as tomato, water spinach, chili, etc., have enough demand.

Post-harvest Processing: The improvement of processing works after harvesting paddy, which include drying, threshing, storage, milling and sorting, are shortcuts to increase quality of rice. After harvesting, paddy with stalk is piled up and dried in or around the paddy field before threshing. Farmers have to be careful not to dry them too much because paddy which is over dried is easy to be broken as the milling. Generally speaking, domestic rice, especially old one, contains quite a bit broken rice, which decreases the taste and the look.

Also, farmers should pay attention to avoid getting mixed with sand and other foreign matter during the drying. Getting sand into rice is the worst case in quality rice market. For example, if a consumer who bought a pack of domestic rice for the first time as a test eats the rice and bites sands, he will never try it again. A grain of sand in steamed rice changes a meal into a penalty game. Fortunately, the possibility of meeting with the worst case seems not so high, comparatively. However, it means sand in rice cause big impact on consumers' choice.

Most threshing is conducted by threshers these days, which seems to be done appropriately in paddy fields. However, farmers also should pay attention to avoid getting mixed with sand and other foreign matter. Prevention against the incorporation with foreign matters, using plastic sheets for collecting paddy, is effective way because there is no practical way of removing impurities efficiently from rice.

Storage which can keep quality of paddy as long as possible needs proper containers which are able to be closed tightly. However, material for which ordinary farmers can apply is limited, such as plastic bags, palm leaves, drums, etc. Hence farmers are required to take care of the way of the storage:

- i) To put the storage bags on a high place where moisture, bugs and rats hardly reach
- ii) To close the mouths of the bags tightly and reduce the times of the unwrapping
- iii) To apply tobacco leaves for the lids, which is a traditional way to prevent the invasion of bags

In the Pilot Project, four tin silos were installed, which are best equipment for storage of grain but the price is not cheap which can allow ordinary farmers to purchase. Therefore, making a group by plural farmers and install the silo by the group is a pragmatic way to buy them or receive from donors.

Those silos which were installed in the Pilot Project are managed in a warehouse of the farmers' cooperative.

As for the milling, farmers have to monitor the work of millers carefully and order them to adjust the milling strength appropriately. Basically, operators of milling machine should be careful not to make broken rice though paddy which was unpolished is more troublesome for consumers. Reducing unpolished paddy in the milling process seems to be difficult because almost all of the unpolished grains are caused by immature paddy, which is not caught by a screen of milling since it is as small as polished rice. Also, using plastic sheets for covering paddy/rice in the process of milling is effective way of prevention against foreign matters.

Sorting of polished rice is the only way to eliminate foreign matters from their commodities. However, practical method of sorting is limited to the traditional way, which uses winnowers. Therefore, as mentioned above, the target of sorting should be addressed to i) sand and ii) unpolished grain.

Marketing: The marketing for selling rice at supermarkets consist of the packaging and the shipment. The farmers' cooperative uses transparent plastic bags for the package, whose advantages as the packaging material are two; i) the label of commodities can be printed on the package, and ii) consumers can check the contents of the commodity without opening. The major consumers who use supermarkets are rich class including foreigners. Basically, their needs are good-quality commodities even if those prices are some high. Domestic agricultural produce can compete with imported foods as for the freshness and the natural cultivation. Hence, producers ought to show the commodity information, such as place name of the cultivation, the quality, etc., which will influence largely the sales.

The farmers' cooperative in the Pilot uses small vehicles for the shipment of their produced rice. Applying an appropriate-size track is important for reducing the transportation cost and possibility of traffic accident because the diesel price is expensive and the road condition and the driving manner are not good through Dili-Baucau is the most well maintained road section in this country.

Selling: In the Pilot, the label on the package of the rice is considered to accomplish the role of advertisement in the stores since all their products were sold out in a few months. The selling price to the supermarkets is decided by the negotiation with their managers. It is considered that proper price setting of the produced rice is conducted in accordance with the general distributional price of the domestic rice. However, the producers ought to grasp the trend of the selling price in the supermarkets in case of the price change.

One of the ways to create additional values in the selling is sale in small lots. Rice selling by small bags is congruent with the demand of consumers who want to buy it first time as a test or want to use it for short period / small family. They choose a small bag even the unit price is higher than that of a big bag because they can save the cost of waste quantity.

(3) The Nurturing Method of Human Resources of the Existing Agricultural Cooperatives for Strengthening Their Operating Capacity

Government officers in the whole country expect that organizing cooperatives and working cooperatively for farming will lead to increase the agricultural productivity. Many farmers in the whole country are also interested in agricultural cooperatives and want to know how to make the

organization, how to start the activity, how to manage them, etc. since they have no idea about those basic information on cooperatives. The following viewpoints are required to nurture human resource related to organizing cooperation and managing the cooperative from the lessons from the pilot project implementation.

The First Step of Organizing a Cooperative: Candidates for the members shall hear the explanation on their plan of the cooperative activities. Through the explanatory meeting, those candidates may agree to make a cooperative. However, the ordinary members shall not work together positively in the scene of actual hard work because basically they have no traditional custom of cooperative work excluding work with relatives. Therefore, it is necessary for the explanation to include the necessity of organizing a cooperative, their actual merit and their obligation through their cooperative activities.

The existence of a leader who is in the members' confidence and can persuade them to undertake the obligation is also required as a matter of course. However, if the members can not understand enough the fundamental system of cooperative activities, the leader should give up the organizing or change the members because the cooperative, whose members are not motivated to work cooperatively and the leader have to persuade them every time, will not be able to continue their activities for a long period.

Business Activities and Handling of Cash: Cooperative is recognized as an organization for business activities since cooperative activities which are expected by farmers are cooperative shipment and selling. However, the significance of the cooperative shipment and selling are seldom understood by the members. It is considered that the major reason of the participation in a cooperative is reliance on others; individual persons have no idea on the measures of shipment and selling or they cannot do them individually. Therefore, the executives whose center is the leader will make the plan of the activities, direct the actual work and manage them. Ordinary members will work in accordance with the indication, which is a kind of division of labor. Those members come not to be interested in the plan of the activities. They will focus on the handling money between the cooperative and the each member. They will feel alienated and have distrust and envy toward the executives. Finally, they will leave the cooperative activities.

It is considered that the members will cooperate with the executives in a short term if they continuously provide short-term business plans, which are realistic and easy to understand. However, it is difficult for the executive of a few persons to continue the provision. The real significance of the cooperative activities is to share their realistic business plans, which were made through the concentration of the members' wisdom, by the each member. The realization of the significance shall perform the effectiveness of the organization.

It is a common case that a cooperative activity is suspended after conflict was raised when the amount of the handling money becomes big in accordance with the size of the activity. The worst case has occurred that some cooperatives were collapsed due to the embezzlement of the cooperative's assets. In order to avoid those cases, cooperatives should accustom their organizations to increase of the handling money through the gradually extension of their activities step by step not to expand it at one time.

Basic Functions of a Cooperative and Capacity Building of Human Resources: Agribusiness activities of cooperatives require the following three basic functions. The minimum number of the staff of a cooperative's operation is three because each function needs different person, who can handle business affairs based on the grasp of the whole outlook on the organization and the activity,

considering the current situation of human resources in rural areas.

- 1) The function of a leader: To lead the organization based on the confidence of the members, direct the members and negotiate with external organizations
- 2) The function of accounting: To manage the accounting, explain the situation of the assets to the members well and make them convinced of the situation usually
- 3) The function of planning: To make a plan of the shipment and the selling, explain the plan well to the members and agree with them on it

As for 1), the existence of a talented person for the leader in a community is the precondition of the organization of a cooperative because the nurturing of the leader is difficult though the strengthening the skills is possible. Regarding 2) and 3), the candidates for those positions have to learn practical measures through the on-the-job training, which is conducted in the actual field by dispatched experts. Their necessary skills are able to be learned through trainings in class.

2-6 LESSONS LEARNED AND FEEDBACK TO THE ACTION PLAN

Effectiveness of the Draft Action Plans practiced in the pilot project was verified based on the implementation process and generated outcomes. Lessons were also learned from this pilot project. Obtained lessons are incorporated into the review of the Draft Action Plans, put on the each project of the Draft Action Plans to finalize master plan.

2-6-1 Rehabilitation of Agricultural Production Infrastructures

Verification	<p>This project is to support production activities of agribusiness target crops through rehabilitation of the agricultural infrastructure such as irrigation facilities.</p> <p>Existing irrigation facilities of wells and pumps were rehabilitated in this pilot project. Objective of the facilities is to irrigate paddy and vegetable cropping. It is judged that validity of the rehabilitation work is high.</p> <p>Rehabilitation work of the wells and pumps in this pilot project is the small scale considering the size of irrigation area, so that it is classified as a small scale project in the framework of the Draft Action Plan. In the project planning, DNPIAC should be considered to be the coordinating organization between beneficial farmers and DNIGUA. As for irrigation rehabilitation in this country, DNIGUA should be the implementation body in the Draft Action Plan. DNIGUA is responsible from survey, planning, design and construction. Effectiveness of the project was verified through activity processes involved DNPIAC, DNIGUA and district agricultural office.</p> <p>Prior to the overall rehabilitation planning, especially for the facilities devastated at the Indonesian withdrawal time, discussion was held with district DNIGUA staff through district DNPIAC. It was discussed that district office might cooperate in preparing stage but, has not a budget to rehabilitate them. It was also discussed that there is no guideline or standard for preparing such rehabilitation works.</p> <p>Considering such constraints, it was decided that all rehabilitation process was led by the study team. Study team guided all process from survey, planning, designing and construction works. Necessary arrangement with the cooperative was made in cooperation with DNPIAC staff in Baucau</p> <p>As for planning of the pumping type with well, diesel engine type was applied from the engineering viewpoints based on the present electric power supply system around the area. It was</p>
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planned under the precondition that operation/ maintenance organization of the diesel engine pump should be established.

Operation and management body after rehabilitation was considered. In the Indonesian time, all processes including excavation of well, installation of pump and its operation/ management were physically and financially supported by the government. However, after the withdrawal, such support from the government was stopped except for a part of agricultural input materials supply. It was said that pump users should be responsible for operation and management. On the other hand, the Cooperative expected to be the gratis support as well as in the previous Indonesian time, so that they requested to provide electric submerged pump which is easy to operate, but, required higher construction cost than the diesel. Possibility study of the submerged pump was surveyed. As the survey result, it was found to be hard to procure the submerged pump and its spare parts in this country. It was also surveyed that present electricity service was not covered with the project area. Based on such survey results, discussion meeting with the Cooperative was repeated to make consensus of the pump type. As the result, diesel engine pump was decided. As for type of diesel engine, it was selected from the type which the cooperative are familiar with operation. Selected type is used widely as general farm machine and easy to procure spare parts in this country.

Financial support for cost bearing of the pump operation was discussed with district DNPIAC staff. As the results, it was concluded to be hard that MAF would bear the cost as grant as well as the agricultural input materials, and the Cooperative should bear the operation and maintenance burden after the rehabilitation. Discussion meetings with the Cooperative were repeated to make consensus of bearing the operation cost. The Cooperative made agreement to bear the cost. Rehabilitation planning was progressed under the district DNPIAC staff's participation in the discussions. After making consensus on rehabilitation plan and design, construction work was carried out.

After completion of the construction works, pumping water was irrigated for dry season vegetable cropping and wet season paddy. During the pump operation, running cost including the expenses of fuel was shared among the pump users. As for the vegetable cropping, the pump users could get benefit through shipping the produced vegetable to the market, after they bore the operation cost. It was observed that the pump facilities were properly operated and managed. Rehabilitation work contributed to the improvement of Cooperative's business operation. Considering these situations, it is verified that activity process taken in this project was effective.

Related to agricultural infrastructure rehabilitation in this country, large scale irrigation rehabilitation projects was completed in Maliana and Manatutu with the assistance of JICA. Small scale rehabilitation work is incorporated as a development component in the RDP3 funded by EU. In addition, "Food Security Good Practices" (funded by EU, 5 NGOs in cooperation with MAF are the implementation bodies) was implemented in Manatuto and Lautem districts. In this works, small ponds were constructed and vegetable gardens were introduced. Like these projects, small scale irrigation systems were being provided with the assistance of relevant aid agencies, although project scale is small and irrigation area is limited.

There are some projects/ plans led by the aid agencies as mentioned above. But, government has no scheme to conduct rehabilitation projects on the country's own budget. In the case of large and medium rehabilitation projects, it would take a long-term to realize the project scheme, and there are constraints such as budgeting and lack of implementation capability. However, small scale rehabilitation works like the pilot project, especially for devastated at the Indonesian withdrawal time, may be easy to approach. It is easy to deal with planning and designing stages.

	<p>Rehabilitation works could be easily led. It is expected to obtain quick development outputs in the short term. Implementation organization should be established in the district level. It is suggested that development stages from survey, planning and designing to construction work should be standardized to accelerate rehabilitation works of small scale irrigation facilities. It was emphasized that operation and maintenance costs could be born by their own organization.</p>
Lessons learned	<p><u>Considering the topographic condition in Timor-Leste, rehabilitation of gravity irrigation system should be prioritized. But, it is unavoidable for farm lands where have no suitable streams in/ around that areas to introduce diesel engine pump with well. It is proposed to standardize the all stages from survey, planning and designing to construction works so as to make rehabilitation works smooth.</u></p> <p>This area exists in gentle steep land between seashore and small mountain. There is no water source. Although river flows near the area, it always is dried up in dry season. Only water source is the well. Pumping from well is the only irrigation water for this area.</p> <p>Basically, gravity irrigation system should be prioritized for provision of irrigation system. If there is no suitable water source in/ around the target area, diesel engine pumping system from well is the only irrigation system. Topographic condition in this country is characterized as steep slope and farmland is formed by small farm plot like this area. As the lessons learnt from this activity process, it is proposed to standardize the development steps from survey, planning and design to construction in order to make rehabilitation of small scale irrigation facilities smooth.</p> <p>Construction works of well excavation and installation of pump was entrusted to local contractor through bidding process. To guide the bidding process, necessary information such as list of local construction companies and their operation capacities, were collected and analyzed. It was surveyed that the number of capable construction company was a few.</p> <p>Rehabilitation works of pumping system should be materialized after making consensus among pump users to establish operation and maintenance organization and bear the operation cost.</p> <p>In Timor-Leste, agricultural production activities are being supported by government for long term from Indonesian time. Therefore, farmers generally tend to rely on government for their farm production activities. Under such farmers' relying sense, this pilot project was anxious about operation and maintenance method including bearing pump operation cost after the rehabilitation works. Discussion meetings were often held to discuss future operation and maintenance methods. In the discussion process, it was also expected to create an ownership sense among the cooperative members and make consensus to bear pumping cost.</p> <p>As the discussion results, they agreed to establish pump operation and maintenance organization. A pump operator was also allocated. He recorded daily operation including input of fuel. The expense of fuel was bourn by pump users.</p> <p>As a result, it was learned that pump users could establish operation and maintenance organization and they could bear the running cost. It should be the precondition in the planning of pump irrigation scheme to establish operation and management organization.</p>
Feedback	<p><u>Development stages from survey and planning to construction works should be standardized to make rehabilitation works smooth.</u></p> <p>In Timor Leste, most of farm lands are characterized as small plot in steep slope. In order to make rehabilitation works in the farm lands smooth, DNIGUA should standardize the development steps. As for the type of irrigation system, gravity system should be prioritized considering future operation and maintenance method led by beneficial farmers.</p>

	<p><u>For proceeding pump rehabilitation, prior to the planning stage, it should be taken action to make consensus of the type of pump and its operation/ maintenance method.</u></p> <p>MAF should take action to discuss with beneficial farmers to clarify the role and responsibility for operation and maintenance of the irrigation facilities when pump rehabilitation is schemed. If the pump rehabilitation is undertaken for agribusiness promotion, DNPIAC in cooperation DNIGUA should organize workshops to create their ownership sense, build O/M consensus. Pump rehabilitation should be planned on the precondition that beneficial farmers would establish operation and maintenance organization.</p>
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2-6-2 Strengthening of Dissemination System of Cropping Technology

Verification	<p>This project is to improve cropping technology of agribusiness target crops in quantity and quality aspects. The agribusiness target crops are used as raw materials for next processing and marketing. Observing current cropping conditions in Timor-Leste, natural farming may be characterized as most effective farming method. So that, cropping technology should be based on the natural farming. Natural farming method such as organic farming should be disseminated as cropping technology. (Promotion of organic farming is recommended in the Timor-Leste's Strategic Development Plan (2011-2030), Office of the Prime Minister April 7, 2010)</p> <p>Extension workers have been allocated in the districts, sub-districts and suco levels. But, dissemination activities of cropping technology are not undertaken yet systematically, because of many constrains such as a lack of knowledge and skill of cropping technology, a lack of training materials and budget limitation so as to materialize dissemination activities. ICM method is recommended by MAF in paddy cropping, but, as for other cropping, suitable cropping technology is not established yet. Under such constraints, related similar projects organized by international aid agencies provide the training opportunities for them. Extension workers can be trained by participating in such projects. They can learn cropping technology and improve their dissemination capability through the training. This is the only training opportunity so that they can learn practical farming method.</p> <p>In this pilot project, the Cooperative and surrounding farmers were trained to make organic fertilizer. In general, it is hard for farmers in this country to get chemical fertilizer since it is imported and its price is high. Considering such constraints, it may be required to disseminate the skill and technology so as to make full use of materials and resource available in the local area. Organic fertilizer can be made from local materials and resource. Training was conducted in the Cooperative's field. Farmers and local NGOs participated in the training. Study team trained them to make organic fertilizer. The fertilizer made was applied in the vegetable fields. Then, it was observed that crops in the field applied it were well grown. They saw that organic fertilizer was effective for growing crops. Making organic fertilizer is being fixed on the farmers.</p> <p>Effectiveness was verified through the training activities. It is judged from this activity that natural farming using organic fertilizer is effective way to make crop production stable.</p>
Lessons learned	<p><u>In order to strengthen natural farming methods, inputs of organic fertilizer and organic pesticide are effective for improving crop growing.</u></p> <p>In Timor-Leste, chemical fertilizers/pesticides are imported at a high price. In addition, it is not easy for farmers to purchase them. Organic fertilizer can be made from surrounding local materials/ natural resources and microorganism. Such fertilizer was effective to help crop growing. These technologies are considered to be effective for labor-intensive crops on small plots such as vegetables.</p>

Feedback	<p><u>Organic farming technology including the way how to make organic fertilizer and organic pesticide and how to spray them should be disseminated as one of the cropping technologies.</u></p> <p>DNPIAC arranges training and extension activities which are to make organic fertilizer and organic pesticide and spray them for strengthening natural farming. DNPIAC acts as a mediator between farmers and extension workers. In order to train farmers, it is effective to make use of local NGOs who learned know-how in this project implementation.</p>
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2-6-3 Support for Set-up of Processing Industries by Farmers/Women's Groups

Verification	<p>This project is to support farmers' groups/ women's groups in setting up/ operating and managing agribusiness activities using locally produced agricultural materials. Approach to supporting activity is largely dependent on target crops and products/commodities as well as the project "Support for Set-up of Private Processing Industries".</p> <p>Supporting activity taken in this pilot project is to strengthen the operation capacity of the Cooperative. The activity was the provision of irrigation water supply, making organic fertilizer and its application for vegetable cropping and improvement of post-harvesting technology and sales promotion of milled rice.</p> <p>Vegetable cropping was conducted by 5 farmers groups (14 farmers and one religious house). After rehabilitation of the irrigation facilities, vegetable such as morning glory, long-bean, mustard, broccoli and tomato, etc. were cropped by applying organic fertilizer learnt in the training. The produced vegetables were shipped to Baucau market as dry season fresh vegetable through local middleman. Participated farmers group could get a certain profit although they bore pump running expenses. Its cost-benefit was verified to be high. The cooperative observed that vegetable cropping in the dry season generated new income source. The cooperative would plan to begin dry season vegetable cropping as the future cooperative activity. However, no participants from the cooperative cropped in this vegetable cropping, since dry season vegetable cropping was not made consensus as cooperative activity among the members. This shows that there is difficulty to make cooperative activity. Some cooperative members hesitated to begin new activity with certain expenses as pump running cost. This also shows that cooperative members not always have advanced challenging sense to strengthen the cooperative. By observing the successful case and accumulating the lessons learnt from the activity, they could strengthen their cooperative activity through putting them on their next activity.</p> <p>Supporting activity aiming to increase paddy production and improve rice quality is on-going. Effectiveness will be verified finally by observing rice shipping to supermarket in Dili and selling. The Cooperative is regarded as the advanced farmers groups in this region and has knowledge and skill about production/ post-harvest processing and sales of rice. The cooperative has also accumulated experiences. The Cooperative could not cultivate paddy last year around the pump stations because no irrigation water expected in the area. However, the Cooperative could cultivate paddy in this year since irrigation water could be supplied by the rehabilitated pump. Paddy cropping is well going. The Cooperative expects to increase the paddy production and sales amount of rice to the supermarket. It is judged from the workshop on paddy cropping that the cooperative members know problems for increasing production, post-harvest processing and sales promotion. They will be able to reflect their activity results on the next paddy cultivation. However, there is fear for making cooperative's operation and management sustainable. Unstable factor is considered to be sustainability of pump operation, and procurement of seed relied on the government policy. In addition, there is understanding gap against new activity among cooperative members as seen in the vegetable cropping.</p>
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	<p>DNPIAC should continue to support the cooperative's activities in cooperation with MED and Baucau agricultural office.</p> <p>Major supporting requirement in strengthening cooperative's capacity is to ensure transparency of accounting system. (Operation of Viqueque ASC established under the assistance with World Bank was stopped because of shady accounting. Recently, one coffee cooperative was also dissolved because of shady accounting same as the Viqueque.) Salgueiros cooperative is the small group having less severe rules. At present, there is no operational problem on accounting system. However, if the Cooperative will become big, it will be more important to train the members so that they can manage accounting system so as to keep transparency by themselves.</p>
Lessons learned	<p><u>It is not easy for cooperative members to make consensus for organizing cooperative activity, especially, in case of new challenging activity with expenses. Long term period is required in order to strengthen the cooperative's capacity</u></p> <p>Cooperative activity could not be organized among cooperative members. Farmers are accustomed to get agricultural input materials from government free of charge. It was not realized to make challenging activity with certain pump operation expenses cooperative activity. In this pilot project, surrounding farmers took a risk and tackled to practice dry season cropping. In order to make consensus, it is required to repeat workshops and discussion meeting, and observe successful cases.</p>
Feedback	<p><u>MED monitors regularly the current situations of the registered cooperatives and takes necessary supports based on the monitoring results. MED supply new technical information about new activity and provides learning opportunity among similar cooperatives and groups.</u></p> <p>DNPIAC provides necessary supports in cooperation with MED for agribusiness promotion. DNPIAC work on to the cooperatives to repeat workshops and discussion meetings, to make consensus to organize cooperative activity. DNPIAC provides for cooperative learning opportunity to observe the similar cases and learn from them.</p>

2-6-4 SUPPORT FOR IMPROVEMENT OF PRODUCT TRANSPORTATION

Verification	<p>This project aims to support farmers/ women groups and processors and transporter in improving transportation method of agricultural crops and processed products from production site to consumption site. In the Draft Action Plan, it is planned to improve transportation system putting stress on fresh products, so that improvement includes provision of low temperature transportation facilities and cold storage. The project also covers to improve packaging method to make transportation and selling more effective.</p> <p>In the pilot project, fresh products were not handled. However, this pilot project supported the activities such as packaging of milled rice and transportation of packaged ones to supermarket in Dili. Through supporting activity processes, effectiveness of this project was verified.</p> <p><u>Packaging of milled rice</u></p> <p>Transparent plastic bags are used for the packaging rice. The transparent plastic bags have two advantages as the packaging material; i) the label of commodities can be printed on the package, and ii) consumers can check the contents of the commodity without opening. The cooperative began the packaging with support of GTZ. After the end of the support, they found out a dealer who dealt with the plastic bags. However, they gave up the order to the dealer because the number of their order at one time was smaller than the minimum number of the dealer. Now they are negotiating with a supermarket to entrust the packaging work including the procurement of the plastic bags.</p>
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	<p><u>Transportation to supermarkets</u></p> <p>The transportation of the produced rice is used small vehicles. The fares are \$80/time from Laga to Dili and \$20/time from Laga to Baucau, which convey about one ton at a time. The cooperative uses three transporters but it is difficult to arrange for a small vehicle in accordance with the plan of the shipment these days. So, they plan to collect more information on other transporters in the sub-district.</p>
Lessons Learned(1)	<p><u>It is necessary for agribusiness targeted products to provide basic material and measures of packaging.</u></p> <p>In the shipment of the produced rice to supermarkets, the packaging by the plastic bags is indispensable since those bags are used for small-sized sales of imported rice. Business is not formed without packaging measures if a large amount of good-quality agricultural products are produced/ processed and the market target can be identified. It is necessary to secure basic material and measures of packaging to avoid the bottleneck of packaging in the promotion of agribusiness. Basic packaging material and measures are able to apply for many commodities, which were also verified in the case of bottles of the soymilk sales in the other pilot project.</p>
Feedback(1)	<p>Basic packaging material and packaging measures should be selected. Information about the procurement of the packaging material and the packaging measures should be collected and compiled for propagation to the related agribusiness groups.</p>
Lessons Learned(2)	<p><u>It is necessary to collect information on transporters and supply to agribusiness stakeholders.</u></p> <p>Transporters who own tracks or small vehicles are generally used to transport a big amount of agricultural produce. However, the arrangement of those vehicles in accordance with a shipment plan is difficult since the number of the transporters is not so big in rural areas. Also, it is required to select a transporter whose transportation fare is lower than fares of other transporters because the ratio of transportation cost becomes relatively high due to poor roads and high fuel expenses. Then, if consignors can use more information on transportation ways, they can select more efficient ways, which will lead to the enhancement of the physical distribution.</p>
Feedback(2)	<p>MAF should collect information on transporters in sub-district level and compile them. The information shall be provided to users through district and sub-district offices.</p>

2-6-5 Introduction of Agriculture Produce Grading System

Verification	<p>This project is to establish introduction of guarantee system for domestically produced agricultural crops and processed products. With providing this system, consumers would feel safety sense to the products. As the result, it is expected to promote sales of the products.</p> <p>The pilot project was trying to sell milled rice which the Cooperative produced to supermarket in Dili. Effectiveness was verified related with the Cooperative's selling activity considering necessity and possibility of introduction of rice grading system.</p> <p>It was found that the price received by Timor-Leste rice farmers could be considerably increased, if the government required a kind of standard of rice grading to appear on the labels of all rice sold in-country, regardless of imported or domestic origin. At present, there are no guidelines set by the government for rice grades and no labeling requirements. In most countries, rice is graded, for example, based on the contents of impurities, broken rice and moisture. High graded rice being of the higher quality is fetched to be higher price. Grades also are required to appear on product labels.</p> <p>Dili supermarkets are already selling over 10 types of imported rice. Rice prices vary widely from \$1.45/kg for Vietnamese jasmine to \$3.25/kg for Japanese kohuku. The rice sold in supermarkets</p>
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	<p>is not promoted on a quality or grade basis. Selling points seem to be; (i) price, (ii) rice variety, (iii) producing country, and (iv) packaging. That being said, in some ways the producing country can be taken as a surrogate for rice quality. Although imprecise because there are differences in rice varieties, generally Japanese and Australian rice sells for more than Thai rice which sells for more than Vietnamese rice. However, in no case is rice grade evident on the labeling of these products. Consumers in the supermarket, without access to grade information, select perceived quality based on country of origin.</p> <p>At present, marketing amount of domestic Timor-Leste produced rice is not many in the public marketplace. Imported rice is on sales in the market. People generally prefer domestic rice to imported one. If the Government required labels to state rice grades, undoubtedly the better quality rice would sell for higher prices. Local farmers would benefit from the requirement for all rice to be graded and labeled. For example, Timor-Leste rice, such as that produced by the Salgueirous Cooperative is of a high quality and sold in the supermarket in competition with imported ones. (The Cooperative ships at \$1.0/kg to the supermarket (2010)). If grading were required, it would be considered that labeling would clearly state that the Cooperative rice is of a high quality. For further expansion of domestic rice from production to processing and marketing, it would be proposed to introduce a kind of quality grade. If grading system would be established, marketing on sales would be activated. If selling price of rice would be set based on the consumers' taste and quality grade, rice farmers could be highly motivated to improve producing rice quality. This would bring to activate rice market.</p> <p>On the other hand, government purchasing system is on-going. It would be hard to realize the rise grading system. At the purchasing, the government has not a clear quality standard. The government purchasing system would be effective for rice farmers in motivating for paddy production if it could be functional as designed. However, the system may be the obstacle for progressive rice farmers who aim to expand their production, improve processing and marketing activities. Introduction of grading system surely give them incentive to improve quality of their producing rice.</p> <p>Although there exist subjects to be solved for introduction of the grading system quality, it is required to try to realize the grading system for activating rice market. It is proposed to consider the necessity of the grading system in parallel with improvement of the government purchasing system. Degree of contents of impurities and broken rice is the minimum standard for setting grading system.</p>
Lessons Learned	<p><u>The introduction of required labeling of rice grade for all domestic rice sales would make rice market active, and benefit local farmers, traders, retailer and consumers.</u></p> <p>No labeling of rice grade is currently required for domestically grown rice. As a result, consumers are not informed of rice grade. Taste of the rice grown in Timor-Leste is preferable for people as of high quality. If grading and labeling were required for all rice, the local rice would be demonstrated to be of a high quality. Although grading system was not verified in the pilot project under the government purchasing system, If rice grading system would be introduced, rice producing farmers would be highly motivated to improve their rice quality. Requirement of posting grades on labels has the potential to boost farmers' processing and sales promotion.</p>
Feedback	<p><u>For activating rice market, grading system should be provided. Content of broken rice and impurities should be the major standard items in the grading system.</u></p> <p>Grading and pricing system for local rice would make attractive for all parties of rice farmers, trader, retailer and consumers, especially for marketing rice not put on the government purchasing</p>

	system. Labeling of rice grades should be required on the packaging of rice. Grading system should be provided based on the content of broken rice and impurities.
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2-6-6 Capacity Development Plan of Agribusiness Stakeholders

Verification	<p>This project is to provide learning opportunity for agribusiness stakeholders such as administration staff, institutes, private sector and farmers'/ women's groups, in order that they can build agribusiness promotion capacity.</p> <p>A general technical training opportunity was provided in the course of this pilot project. Group training was conducted, aiming to support the nurturing of agribusiness stakeholders. Participants were recruited nationwide, from DNPIAC staff in central and district levels and agribusiness groups such as Salgueiros cooperative and other farmers' groups/ women's groups. Training subjects were set as general and junior agribusiness courses, and covered subjects such as organizing and strengthening cooperatives, planning and practicing agribusiness promotion, role of administration for capacity development of cooperatives and agribusiness groups. Trainers were collected from domestic human resources such as persons from the Cooperative Directorate of MED and the private sector, who are well versed in agribusiness. A total of 25 persons participated in this group training for 15 days. Participants and trainers are expected to become responsible persons, who will lead future cooperative activities and agribusiness promotion. After the training, they commented that; it was helpful to obtain basic knowledge and develop their capacity about cooperatives and agribusiness; it was desirable to open this style of training regularly. Group training like this is also considered to be effective to build an agribusiness human resources network. It is considered that the training might be helpful for participants to develop future agribusiness activities. District DNPIAC staff is placed in the frontline of agribusiness promotion. It is judged that group training like this is helpful for them to improve their executing capacity.</p>
Lessons learned	<p><u>Group training participated from private groups and government was effective to build their capacity and make human resources network among private and government agribusiness persons.</u></p> <p>Group training was successfully conducted. The training was organized by in-country human resources including trainers, so that, mutual communication was easy and active, rather than in the oversee group training. Especially, for DNPIAC staff participated, it could contribute to building their capacity. It is desirable to have training opportunity regularly, providing practical learning in the actual agribusiness activity sites.</p>
Feedback	<p><u>DNPIAC undertake to have group training regularly for related persons with agribusiness in cooperation with MED and MAF. The training aims to develop their agribusiness capacity.</u></p> <p>MAF organizes group training regularly for related persons with agribusiness. DNPIAC act as implementation body for this training. DNPIAC makes full use of in-country human resource to make mutual communication smooth.</p>

CHAPTER 3 VALUE-CHAIN IMPROVEMENT FOR SOYBEAN PRODUCTS

3-1 IMPLEMENTATION PLAN

3-1-1 Objective

This project aims to improve value chain of the soybean products through making linkage between soybean producing farmers and soybean processors, and facilitating to develop soybean products using the produced soybean

Box-1. Background of selecting soybeans as the target crop

International Market: The fact that China has turned to soybean importing country impacts to increase the international soybean price. Therefore, the local soybean becomes competitive in pricing.

Domestic Demand: Generally, the food style for Timorese tends to be lack in nutrient value of protein, therefore soybean products can be vital source for keeping health.

Food Processing Business: Some soybean products are distributed in Timorese markets, and there is possibility to add value to process from soybean raw materials.

Agricultural Production: Soybeans have been planted in Timor, and locally-fixed varieties are found in various areas. Organic farming is one of suitable solutions under difficult circumstances to procure chemical fertilizers and chemical pesticides. Introduction of bean crops as rotation farming is also important for fixation of nitrogen into soil.

3-1-2 Verification Theme

- The possibility of the contract farming between soybean processors and domestic soybean producers or soybean traders.
- The process of supporting soybean processing industries.

3-1-3 Contents of the Project

This pilot project is consisted of the following sub-projects based on the difference in contents and target groups of each.

Sub-projects	Contents
1. Value Chain Improvement for Soybean Products (Wide Marketing Area)	Improvement of value chain in country wide marketing area. Soybean processor in Dili and Soybean producing farmers distributed in wide areas is the actors to make the linkage.
2. Value Chain Improvement for Soybean Products (Local Small Marketing Area)	Improvement of value chain in local small marketing area in Bobonaro district through strengthening cultivation technology of soybean producing farmers.

3-2 VALUE-CHAIN IMPROVEMENT FOR SOYBEAN PRODUCTS (Wide Marketing Area)

3-2-1 Activity and Implementation Organization

(1) Activity

Main Activities consist of “Conducting contract farming between soybean processors and soybean producers”, “improvement of farming technology of soybean producers”, and “Developing and promoting new soybean product utilizing soybean procured by contract farming”. Under each main activity, following supporting activities and economic activities were conducted.

1) Supporting Activity

Supporting Activity 1 Total Management

The study team assisted DNPIAC to design the implementation plan. DNPIAC with the study team expert visited on three soybean processors and selected one processor to collaborate. Finally, detail activities were decided.

Supporting Activity 2 Human Resource Development

DNPIAC with the study team expert examined to develop skills of extension workers to instruct organic farming methods to farmers. For the operators of soymilk plant, especially for full water type retort machine and diesel boiler, training of operation and maintenance was conducted by equipment manufacturer's engineers.

Supporting Activity 3 Technical Improvement

The study team expert has improved appropriate applied technologies to support value-chain such as selection of local variety seed, organic farming, standard of grades, food retorting and packaging.

Supporting Activity 4 Procurement of Equipment

The study team procured full water type retort machine and diesel boiler, while the processor purchased blowing/ stretching machine of PP (polypropylene) bottle and filling machine. The high quality local seeds were arranged by DNPIAC and the local consultant purchased the seeds and distributed to farmers' groups.

2) Economic Activity

Main Economic Activity 1 Commodity Development Planning

At first, the local consultant discussed a nutrient element lacking for general consumers with the study team expert and the internist. For the planning of the commodity, it was considered factors; reality of possible supply of raw materials (organic soybeans), producing performance and technical level of the processor and prolonging methods of quality preserving period.

Main Economic Activity 2 Raw Material Production

The most important matter for processing industry is stable supply of raw materials. Supplying channels had been arranged in three ways; intervention of local NGO, reliable middlemen and direct contract farming.

Main Economic Activity 3 Processing

The critical advantage to market food products in Timor-Leste is prolongation of preserving period due to poor infrastructure of roads and electric power supplies. It is necessary to explore the most effective sterilizing methods of rich nutrient and perishable soymilk. Also, packages had been improved day by day.

Main Economic Activity 4 Marketing

The local consultant and the study team expert had examined and practiced effective and efficient marketing approaches at each process using AIDAS model, which shows consumers' psychological process on purchasing goods adapting to food product industry. The processes include A; attention, I; Interest, D; desire, A; action and S; satisfaction.

Main Economic Activity 5 Sales

During the project, the urban inhabitants living in Dili had been concentrated as the prior target of sales, and taste of soymilk has been adjusted after test-sales to meet people's favorites.

(2) Implementation Organization

Implementing body	: DNPIAC
Technical assistance	: GVF (Green Village Food Ltd.) : contract farming, soybean agronomy, postharvest, processing & marketing District agricultural extension workers (Viqueque, Bobonaro)
Monitoring	: GVF, District agribusiness officer, DNPIAC
Related organization	: MTCI, GIZ projects, IFC
Target group	: Soybean Producers: 3 groups (60 farmers): Bibileo village, Viqueque sub-district, Viqueque district 1 group (40 farmers): Abat-oan village, Natabora sub-district, Manatuto district 1 group (1 farmers' leader); Fatomaka village, Vilale sub-district, Baucau district 4 groups (80 farmers); Fuiloro village, Lospalos sub-district, Lautem district Soybean Processors: 1 processor for soymilk, 1 processor for tempe

3-2-2 PDM, Activity Process and Monitoring

(1) PDM

PDM for this project is shown in Table 3-2-1.

(2) Activity Process

Project activities to improve value chain for soybean products are designed as follows:

Activity	Working Progress	Problem	Measure
Arrangement of contract farming	<ul style="list-style-type: none"> - Prior to the contract farming, the processor negotiated with selected farmers groups and made an oral agreement as the first attempt, under the conditions such as applying locally-fixed variety seed in Maubisse, purchasing their harvesting crops at the market price and conducting organic farming. - It is agreed that next contract will be made after evaluation of organic farming. 	<ul style="list-style-type: none"> - Consciousness of farmers on contract supply should be created. - Post-harvest treatment should be fully understood by soybean farmers. - The harvest volume per group is quite limited at 1-2 tons. 	<ul style="list-style-type: none"> - Based on the production outputs by natural farming, contract farming should be concluded in detail including procurement source of seed, field topographic conditions (drainage system), timing of organic fertilizer and natural pesticides. - The farmers' groups of cooperatively large scale in cropping areas will be targeted to contract supply of soybean such as groups in Fuiloro, Lospalos, Lautem District.
Improvement on agricultural technology	<ul style="list-style-type: none"> - Procuring seeds from Maubisse areas and distributing seeds to producing farmers. - Carrying out organic farming by farmers' groups. 	<ul style="list-style-type: none"> - Soybean production in the contracted farming area in Bibileo village, Viqueque district decreased at 80 % than the expected one, due to flood disaster. - In addition, harmful insect stinkbug '<i>Nezela</i> 	<ul style="list-style-type: none"> - In order to ensure soybean supply, contract farming is planned to extend to the districts of Bobonaro, Manatuto and Lautem. - Technical training on pest control including stinkbug utilizing natural pesticide and wooden charcoal vinegar mainly to district extension workers had been organized. Trained extension

		<p><i>viridula</i> increased explosively. As the results, beans became atrophied.</p> <p>- Shortage of seed supply was occurred in March-June, 2011.</p>	<p>workers should extend the trained technology to farmers.</p> <p>For explore of seeds, DNPIAC arranged to contact reliable farmers. It was very helpful to sustain the project.</p>
Improvement on food processing	<p>- Selecting the packaging methods to preserve long-life quality of products.</p> <p>- Procuring necessary equipment such as retort machine to develop the new commodity 'Organic Soymilk' and operating the food processing equipment.</p> <p>- Sterilizing soymilk to be possible to store and transport at ambient temperature.</p>	<p>- Packages should be hygienic and in low costs.</p> <p>- Strengthening capacity on operation and maintenance of equipment for the processor.</p> <p>- Testifying suitable sterilization in temperature and time.</p>	<p>- The processor and the study team expert examined packaging materials from aluminum can, glass bottle, Tetra Pack, PET bottle and PP bottle. Finally, PP bottle is selected considering initial procurement costs of equipment, packaging material costs and durability on slightly-acidity of soymilk liquid.</p> <p>- For operation and maintenance of equipment, the electrical/ mechanical engineers dispatched from the manufacturer of equipment carried out installation, test-run and on-the-job training.</p> <p>- The sterilizing temperature was set at 120° centigrade, because bacteria, fungi and virus living on the Earth can be died at the temperature. According to experimental practices at the processing factory, duration of sterilization should be for 30 minutes. As the result, the bottled and sterilized milk can stand for 3 months or more.</p>
Improvement on marketing and sales	<p>- Taking actions to psychological processes of consumers based on AIDAS model.</p>	<p><u>Attention</u> : Appeal of predominance of the product</p> <p><u>Interest</u> : Introduction and test-sales in restaurants</p> <p><u>Desire</u> : Adaption to consumers' acceptability in taste</p> <p><u>Action</u> : Easiness to buy the product</p> <p><u>Satisfaction</u> : Correspondence to consumers' requests</p>	<p><u>Attention</u> : The following sales points had been appealed through advertisements in newspaper, interviews by newspaper, radio commercial message and exhibitions; using local organic soybean, not using artificial chemical preservatives and healthy food with rich protein.</p> <p><u>Interest</u> : The characteristics of product had been instructed to UN experts and donors at restaurants in Dili, and then started selling at the factory.</p> <p><u>Desire</u> : It was identified that Timorese prefer sweet taste so that sugar is added at 4.0-4.5%.</p> <p><u>Action</u> : For efficient distribution to consumers, the products are sold in supermarkets initially.</p> <p><u>Satisfaction</u> : Many aged consumers requested non-sugar type soymilk, thus that type has started selling by the different label.</p>

		
<p>Viqueque district suffered flood damages from long-term rainfall. Contract farming in low lands were flooded. It made reduce production. Framers, however, will to resume contract farming. They are trying to crop. However, to ensure dry season soybean production for processor, contract farming area is expanding to the districts of Bobonaro, Manufahi and Manatuto.</p>	<p>80% of contract farming fields was damaged by flood or land sliding in Viqueque. There were not harvested in the damaged fields. Soybean was harvested in the remaining well-drained fields. Harvested soybean should be dried at 13.5% or less before shipping.</p>	<p>Locally-fixed variety seeds produced in Maubisse area is planted as trial in other areas. Viqueque local seed (left) was 30 cm in height, while Maubisse seed (right) was 50 cm. Sizes of the beans were 4.6 mm and 6-10 mm, respectively. The number of bean collected was counted in the same size fields. It is evaluated that quality of Maubisse's seed is higher than that of Viqueque seed.</p>
		
<p>Under the influence of long-term rainfall, harmful pests were attacked. Damage by the '<i>Nezela viridula</i>' was expanding. It was required to take any useful measures for the prevention of pests. As the results, natural pesticide was effective. To extend the technology of natural pesticide, extension worker was trained in the Bobonaro district, where is the advanced area of the natural pesticide to learn know-how of making natural pesticide and spraying it. After training, they transferred those technologies to farmers group implementing contract farming.</p>	<p>For making PP bottles, the Preform is heated at about 180°C. The soften preform is inserted on the mold and blown by high pressure air. The problem is sunstable three-phase current of commercial power supply, which makes defective bottles.</p>	<p>After washing and steaming soyeam by the steam boiler, soymilk is extracte by the crashing machne. Soymilk is filled into the bottle by filling machine and sterilized by the retort machine. Tofu is mixed soymilk with the powder of calcium sulfate, fixed by mould and pressed. Byproduct (<i>okara</i>) is sold as swine feeds. Approximately 5 liter of soymilk (=10 bottles) can be extracted from 1 kg of dried soybean.</p>
		
<p>The steam boiler was procured by the project. The capacity is 750 kg/hr and diesel oil is used for burning. The fuel cost occupies secondary percentage following packing cost, but its cost per bottle will reduced after expanding of production. Water is used from borehole through water softener device to reduce hardness. Water quality is one of key factor to decide taste of soymilk and tofu.</p>	<p>Full-water type retort machine (or autoclave) and trolleys were produced by the project. The upper tank keeps hot water heated by steam boiler, and hot water drops to lower tank at high pressure and high temperature of 0.2MPa and 120°C for 30 minutes sterilization. This system is called retort food processing. At that temperature, any virus and bacteria can be died.</p>	<p>Soymilk is packaged into polypropylene bottle. Now, 2 kinds of soymilk are sold as sugar type and non-sugar type responding to clients' requests. The product can be stored at ambient temperature, thus distribution to rural areas is possible. The selling points including supermarkets and small shops are counted at more than 50 places in Dili until June, 2011.</p>

Table 3-2-1 PDM for Value Chain Improvement for Soybean Products (Wide Marketing Area)

Project Name: The Pilot Project for Value Chain of Soybean Products (Wide Marketing Area)

Target Groups: Bibileo Farmers' Groups (Viqueque District), Soybean Processor (Green Village Food Ltd., Dili), Farmers' Groups in Bobonaro, Manatuto, Ainaro, Viqueque & Lautem

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption										
<p>Overall Goal</p> <p>A market channel of domestic produced soybean is established through improvement of value chain of soybean.</p>													
<p>Project Purpose</p> <p>Value chain of organic soybean from production to sales of processed products is constructed in a wide marketing area.</p>	<ol style="list-style-type: none"> Cash flow of the processor From 50packs/day (12.2010) to 500bottles/day (5.2011), equivalent to 375US\$/day Cash flow is surplus except depreciation costs of machines. Purchased tonnage of soybean is total 10 ton (3-5.2011). 	<ol style="list-style-type: none"> Records of the processor 	<p>Unexpected heavy rain, flood or low temperature in dry season does not occur. But, it was heavy rain from 1.2011-4.2011 due to climate change in upper lands.</p>										
<p>Output</p> <ol style="list-style-type: none"> The farmers' groups conclude a supply contract with the processor in Dili. The farmers' groups supply organic soybean in quantitatively and qualitatively. The processing technology of soybean is improved. New nutrient products of soybean are developed and sold in domestic market and specific buyers. 	<ol style="list-style-type: none"> Number of contracted groups are 8 groups in Viqueque, 1 group in Manatuto & 5 groups in Bobonaro. 4 groups in Lautem will join. FG supplied 3 tons from 10.2010-5.2011. Rejection ratio is 20% due to attack of insects. Processing performance is slowing developed due to shortage supply of local beans in 5.2011. The soy milk is delivered to 16 supermarkets and 20 restaurants in 5.2011. Protein contents of beans are very high at 49% in dry weight (inspected by Ace Canning Co. Ltd in Malaysia). 	<ol style="list-style-type: none"> Interview to the farmers and the processor Records of transaction between the farmers' groups and the processor Interview to the processor <p>Records of the processor</p>	<p>International prices of soybean do not decrease rapidly. The prices increase from 348.95US\$/ton in 4.2010 to 501.48US\$/ton in 4.2011. Famine does not occur in the target groups, but prices of beans increases at 2-300% due to shortage of supply. Pests do not affect in large-scale impact, but long rain affects on sting bags.</p>										
<p>Activity</p> <ol style="list-style-type: none"> Conclusion of contract farming; Processor <ol style="list-style-type: none"> 1-1) contracts with soybean traders in Ainaro district, 1-2) provides quality soybean seeds to contract farmers in Bobonaro, Viqueque, Manatuto and Lautem, 1-3) provides necessary information regarding organic farming to farmers' groups. Soybean cultivation <ol style="list-style-type: none"> 2-1) MAF extension workers provide soybean cultivating technology to farmers' groups. 2-2) The farmers' group learns post harvest of soybean and collect at the agreed place and time. 3) Processing and selling <ol style="list-style-type: none"> 3-1) Food processing method by retorting machine is introduced for soymilk production. 3-2) Selling of soymilk and related products are Promoted. 	<p>Input</p> <table border="1"> <thead> <tr> <th>Study Team Side</th> <th>Local Side</th> </tr> </thead> <tbody> <tr> <td>Personnel</td> <td>MAF Personnel</td> </tr> <tr> <td> Transaction expert 1 person Local farming supervisor 2 persons JICA study team members (Advisor on organic farming) 1 person Technical engineers from manufactures 2 persons </td> <td> MAF Agricultural extension workers MAF Agribusiness officer for monitoring and promotion in the events </td> </tr> <tr> <td>Facility and materials</td> <td>Facility and materials</td> </tr> <tr> <td> Purchased soybean seeds Materials of natural pesticides, charcoal vinegar and organic fertilizer Processing machines (Retort machine and boiler) </td> <td> Provided by the processing factory Processing machines (filling machine, PP bottle making heater and blower, 3-phase power intake) Processing materials (perform bottle, cap, label, seal) </td> </tr> </tbody> </table>	Study Team Side	Local Side	Personnel	MAF Personnel	Transaction expert 1 person Local farming supervisor 2 persons JICA study team members (Advisor on organic farming) 1 person Technical engineers from manufactures 2 persons	MAF Agricultural extension workers MAF Agribusiness officer for monitoring and promotion in the events	Facility and materials	Facility and materials	Purchased soybean seeds Materials of natural pesticides, charcoal vinegar and organic fertilizer Processing machines (Retort machine and boiler)	Provided by the processing factory Processing machines (filling machine, PP bottle making heater and blower, 3-phase power intake) Processing materials (perform bottle, cap, label, seal)		
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3-2-3 Final Evaluation

(1) Implementation Organization in the Activity Process

Prior to proceeding to the contract farming, soybean seeds producing farmers are selected. To select farmers, necessary information such as local production conditions and past cropping performance was brought by central and district DNPIAC staff and related processors. Based on such information, the target farmers were found from the Maubisse area. DNPIAC staff participated in these selection processes and the site investigation to seek reality of seed production in the selected Maubisse area and negotiate with the selected seed producing farmers. Seed production and its procurement were performed smoothly under the cooperation with them. After the seed production, necessary activity to conclude contract farming was led under the participation of related district DNPIAC staff and targeted processors. DNPIAC staff participated in the negotiation with production framers group as a mediator in information.

District extension workers in Viqueque learned the ways how to make natural pesticide (made from natural plants and medical herbs) and how to spray it to crops in the cropping process. After the learning, the extension workers transferred this leaned skill into soybean producing farmers of the contract farming. However, it is required to repeat teaching of the related farmers until its technology could be accepted. By repeating such technology transfer, reliable relationship between extension workers and farmers would be generally established. For DNPIAC staff, it is an important role to make arrangement for providing technology transfer opportunities for both farmers and extension workers. In order to make such transfer useful, extension workers should improve their own capacity of cropping technology. Besides, it may be required to give some incentives to transfer technology to farmers. And, it is the most importance to show success results in field as the results of technical transfer.

In the case of marketable crops, it is also effective to be carried out the technical transfer by appointed experts of processing companies or agricultural expertise NGOs.

(2) Final Evaluation

Items	Final evaluation
Validity (Score: 4)	Bottleneck to improve the value-chain of local produced soybeans from production, processing/ marketing to consumption is to develop selling stage. For local produced soybeans, marketing channel is quite limited so far into selling to government purchasing system or the shipping to West-Timor through traders since domestic processing industry had not been developed fully. Government purchasing system is not well functioned yet. It is not easy for soybean producing farmers to find other marketing channels. In terms of promotion of organic soybean as a niche market, it is possible to linkage soybean farmers with soybean processors such as tofu, tempe and soymilk. Those value-chains of soybean would be formed in the domestic market only. Improvement of value chain may encourage soybean producing farmers to produce soybean. It may lead to expand soybean production through strengthening processing and marketing process in domestic level. The project aiming at making such value chain may contribute to national food security. It is evaluated that the project is validity.
Effectiveness (Score: 4)	The project aims to expand selling value-added soybean products through improvement of value-chain. The present activities are put on improvement of soybean production to ensure provision of raw material to manufacture soybean products. The processor is manufacturing organic soymilk and tofu. To manufacture those products, introduction of sterilizing

Items	Final evaluation
	<p>machine is essential. The processor used to sell 20 liter soymilk and 100 piece of tofu at daily average, but now sell 250 liter soymilk (equivalent to 500 bottles) to major supermarkets and small shops. Furthermore, the target of sales is set at daily 1,000 bottles as the results of verification in operation and consumers' demands, therefore effectiveness of the project is appeared.</p>
<p>Efficiency (Score: 3)</p>	<p>There are affirmative results to upgrade quality of soybeans using agricultural technology; application of locally-fixed variety seed, wooden charcoal vinegar, perfectly-fermented compost using available micro-organisms and natural pesticide. These technologies are comparatively acceptable by leading farmers. And, it was observed that such technologies led to produce the immediate effect in quantity and quality of soybean production. Soybean might the crop which farmers could crop easily, if basic cropping technology and land drainage conditions would be provided. But, production may be prone to be affected for natural and land condition. It was understood that cropping technology training should be repeated until it could be fixed in the action groups. Production target might be attained by low cost inputs in the production stage. At processing stage, operation of the retort machine assists efficient distribution due to long-life more than 3 months without preservatives, which means the losses in processing and storing can be almost reduced.</p> <p>As economic evaluation, the benefit-cost (BC) ratio is estimated based on actual results from March to May, 2011. In the current selling at 500 bottles/day, BC ratio is calculated at 0.85 with depreciation expense (repayment period of retort machine: 8 years) and 1.02 without depreciation expense. It indicates positive cash flow even in limited amount. In the targeted 1,000 bottles/day, the BC ratio will be calculated at 1.06 with depreciation expense and 1.18 without depreciation expense, which shows sustainability on this business model.</p> <p>Soymilk of 5 lit is manufactured from the soybean 1.0 kg. Based on the production cost of soybean and selling price of soymilk, the value added on the soybean has increased about 10 times since it was produced.</p>
<p>Impact (Score: 4)</p>	<p>Farmers groups for contract farming were started from the five groups of Maubisse sub-district, Ainaro district, Viqueque sub-district, Viqueque and Natarbora sub-district, Manatuto, and then numbers of groups are increasing to total 19 groups in June, 2011. Key persons to support supply are the local trader in Maubisse, district extension workers in Viqueque, farmers group themselves in Natarbora, local NGO in Maliana and District Agricultural Director in Fuiloro. Before implementing the pilot project, there was no sustainability and reliability on interventions by government purchasing system, thus it was very difficult to create marketing channels for soybean farmers. Under such situation, the project put on the processors as the sales target for them in the channel of their produced soybean distribution. It is considered that there is impact on micro economy for farmers groups and processors to build marketing linkage. In fact, some farmers groups have requested for technical supports in Viqueque and Bobonaro districts. Besides that group, the farmers who are interested in contract farming with organic farming method are increasing. During the project implementation, soybean production was affected by outbreak of pests and unexpected climate changes. Since the dry soybean price has jumped up from US\$0.60 in January, 2011 to US\$1.20 in June, 2011, the force to adjust selling price of soymilk will be affecting.</p>
<p>Sustainability (Score: 3)</p>	<p>Considering the working progress of this project so far, it is the key subject for improvement of the value-chain of soybean to solve problems arising in the cultivating stage. Making soybean cropping more stable is the key for project sustainability. In order to</p>

Items	Final evaluation
	ensure sustainability, it is indispensable that extension workers who are responsible for promotion of cultivating technology participate in soybean production activities. However, judging from the implementation progress, it seems that extension workers should learn organic farming technology and build capacity to promote soybean as a rotation crop. It is necessary to provide training opportunities for them. Suitable evaluation system of technical transfer performance may give much incentive to extension workers. Most of soybean farmers have conscious on technical improvement, since the improvement may increase production and create income generation. Critical points to cope with improvement of the value-chain will be clarified from the pilot project implementation process. Then, in order to ensure the project sustainability, it is required to provide supporting system emphasizing on production to MAF.
Total Score: 18	

Cost Volume Profit Analysis

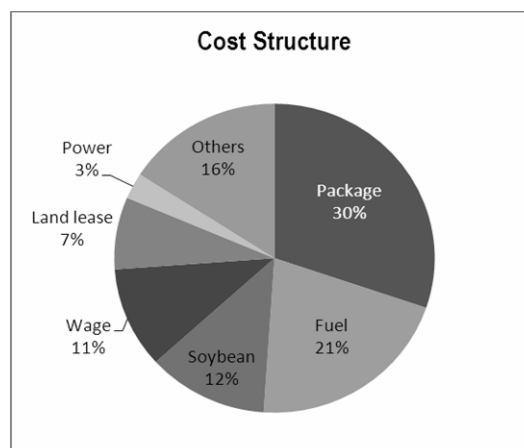
Table 3-2-2 Monthly Cost Benefit Analysis

MONTHLY FINANCIAL ANALYSIS					MONTHLY FINANCIAL ANALYSIS						
As of May 2011					Expected in June 2011						
Prerequisite	1kg soybean can make	5 lit of soy milk	=10 bottles		Prerequisite	1kg soybean can make	5 lit of soy milk	=10 bottles			
	7.875	packs of tofu				7.875	packs of tofu				
	Sugar 4.0% type soy milk					Sugar 4.0% type soy milk					
	Sales of soy milk (500ml)	500	bottles/day			Sales of soy milk (500ml)	1000	bottles/day			
Costs of Production					Costs of Production						
Item	Specifications	Qty	Unit	Unit Price (US\$)	Amount (US\$)	Item	Specifications	Qty	Unit	Unit Price (US\$)	Amount (US\$)
Soybean, Dried		1200	kg	1.00	1,200.00	Soybean, Dried		2200	kg	1.20	2,640.00
Loss of soybean		1	%	1,200.00	12.00	Loss of soybean		1	%	2,640.00	26.40
Power consumption	1-phase 2A, 3-phase 20A	1620	kWh	0.17	270.00	Purchase of soybean seed	40kg/ha	147	kg	1.50	220.50
Land lease	200m2	1	month	750.00	750.00	Power consumption	1-phase 2A, 3-phase 20A	2592	kWh	0.17	440.64
Wage	senior (sales manager)	1	man-month	300.00	300.00	Land lease	200m2	1	month	750.00	750.00
	senior (factory leader)	1	man-month	180.00	180.00	Wage	senior (sales manager)	1	man-month	300.00	300.00
	junior (skilled worker)	1	man-month	120.00	120.00		senior (factory leader)	1	man-month	180.00	180.00
	junior (ordinary worker)	3	man-month	90.00	270.00		junior (skilled worker)	1	man-month	120.00	120.00
Allowance	for 4 men, food	1	lot	180.00	180.00		junior (ordinary worker)	5	man-month	90.00	450.00
Fuel for Boiler	diesel	1250	lit	1.28	1,600.00	Allowance	for 6 men, food	1	lot	270.00	270.00
Fuel for Van	petrol	304	lit	1.30	395.20	Fuel for Boiler	diesel	2000	lit	1.28	2,560.00
Fuel for Sedan	petrol	60	lit	1.30	78.00	Fuel for Van	petrol	456	lit	1.30	592.80
Package, Bottle	for soy milk, PP, preform, Chinese made	12500	pcs	0.20	2,500.00	Fuel for Sedan	petrol	60	lit	1.30	78.00
Package, Cap	for soy milk, PP, Chinese made		pcs	included above		Package, Bottle	for soy milk, PP, preform, Chinese made	25000	pcs	0.18	4,500.00
Package, Label	for soy milk, printed seal, Chinese made		pcs	included above		Package, Cap	for soy milk, PP, Chinese made		pcs	included above	
Package, Seal	for soy milk, aluminium, Chinese made		pcs	included above		Package, Label	for soy milk, printed seal, Chinese made		pcs	included above	
Package, Cortonbox	Indonesia made 12/box	1000	pcs	0.50	500.00	Package, Seal	for soy milk, aluminium, Chinese made		pcs	included above	
Fine sugar	for soy milk, Thai made	175	kg	0.95	166.25	Package, Cortonbox	Indonesia made 12/box	1500	pcs	0.50	750.00
Package, Film	for tofu, Chinese made	1890	pcs	0.10	189.00	Fine sugar	for soy milk, Thai made	350	kg	0.95	332.50
Package, Label	for tofu, printed seal, Chinese made		pcs	included above		Package, Film	for tofu, Chinese made	1890	pcs	0.10	189.00
Calcium sulfate	for tofu	3.75	kg	1.00	3.75	Package, Label	for tofu, printed seal, Chinese made		pcs	included above	
Mobile phone		250	unit	1.00	250.00	Calcium sulfate	for tofu	3.75	kg	1.00	3.75
Advertisement	newspaper (timor post)	1	month	160.00	160.00	Mobile phone		250	unit	1.00	250.00
	radio (spot)	1	month	300.00	300.00	Advertisement	newspaper (timor post)	1	month	160.00	160.00
Business license	2years @200US\$	1	month	8.33	8.33		radio (spot)	1	month	300.00	300.00
Purchase of spareparts		1	set	500.00	500.00	Business license	2years @200US\$	1	month	8.33	8.33
Depreciation						Purchase of spareparts		1	set	1,000.00	1,000.00
Autoclave	@57213\$, 8years repayment	1.04166667	%	57,213.00	595.97	Depreciation					
Boiler	@12470\$, 8years repayment	1.04166667	%	12,470.00	129.90	Autoclave	@57213\$, 8years repayment	1.04166667	%	57,213.00	595.97
Filling Machine	@10000\$, 8years repayment	1.04166667	%	10,000.00	104.17	Boiler	@12470\$, 8years repayment	1.04166667	%	12,470.00	129.90
Heating & Strech Machines	@15000\$, 8years repayment	1.04166667	%	15,000.00	156.25	Filling Machine	@10000\$, 8years repayment	1.04166667	%	10,000.00	104.17
Other machines	@20000\$, 8years repayment	1.04166667	%	20,000.00	208.33	Heating & Strech Machines	@15000\$, 8years repayment	1.04166667	%	15,000.00	156.25
Van (secondhand)	@10000\$, 3years repayment	2.78333333	%	10,000.00	278.33	Other machines	@20000\$, 8years repayment	1.04166667	%	20,000.00	208.33
Sedan (secondhand)	@15000\$, 4years repayment	2.08333333	%	15,000.00	312.50	Van (secondhand)	@10000\$, 3years repayment	2.78333333	%	10,000.00	278.33
Building Extension Work	@5000\$, 7years repayment	1.19166667	%	5,000.00	59.58	Sedan (secondhand)	@15000\$, 4years repayment	2.08333333	%	15,000.00	312.50
Equipment Installation Work	@6000\$, 8years repayment	1.04166667	%	6,000.00	62.50	Building Extension Work	@5000\$, 7years repayment	1.19166667	%	5,000.00	59.58
Power Intake Work	@3000\$, 15years repayment	0.55833333	%	3,000.00	16.75	Equipment Installation Work	@6000\$, 8years repayment	1.04166667	%	6,000.00	62.50
Borehole Work	@1000\$, 15years repayment	0.55833333	%	1,000.00	5.58	Power Intake Work	@3000\$, 15years repayment	0.55833333	%	3,000.00	16.75
						Borehole Work	@1000\$, 15years repayment	0.55833333	%	1,000.00	5.58
Total	with depreciation				11,882	Total	with depreciation				18,082
	without depreciation				9,933		without depreciation				16,122
Sales						Sales					
Soy milk		12500	bottles	0.75	9,375.00	Soy milk		25000	bottles	0.75	18,750.00
Tofu		2100	packs	0.60	1,260.00	Tofu		2100	packs	0.60	1,260.00
Loss		5.0	%	10,635.00	-531.75	Loss		4.5	%	20,010.00	-900.45
Total					10,103	Total					19,110
Benefit/Cost Ratio	with depreciation				0.852	Benefit/Cost Ratio	with depreciation				1.059
	without depreciation				1.017		without depreciation				1.185

The costing structure as of May, 2011 composes of 30 % in packaging (including PP bottle, label and cap). These costs will decrease after increasing sales volume. The second cost is fuel for the boiler to make steam for boiling soybean and sterilizing soy milk. This cost per bottle will decrease in more production, but the price increase of oil products may attack directly. The third cost is for purchase of

dried soybean from farmers, and increase proportion to selling volume of soymilk. The purchasing price at the factory is fluctuated from US\$0.60 in October, 2010 to US\$1.20 in June, 2010 due to climate changes since the last year. The success farmers to grow soybean are very profitable, but suffering farmers from floods, land-sliding and pests had lost income sources from soybeans.

Regarding the soybean production in Timor-Leste, MAF statistics shows at 956 ha in areas and 800 tons in 2008 and 1,532 ha and 1,818 tons in 2009. It is necessary to get 75 tons of dried soybeans annually in maximum soymilk production at 1,500 lit/day (=3,000 bottles/day) under the full operation of equipment by 3-shift working. This quantity is the sufficient scale by domestic



production of soybeans. The market demands of soymilk are expected to be more than 1,000 bottles per day in Dili. If considering the general demands in district towns and the special demands for school children and solders, it is expected to be created the niche market at more than 3,000 bottles per day.

The largest risks might be rapid price increasing of fuel, losses of PP bottles due to unstable electric power supply in 3-phase current and its voltage and climate changes to be affected to soybean production. The business model is not easy to copy, thus the drop of price will not be occurred. Also, there is strong competitiveness in price and quality with imported soymilk packaged by Tetra Pack.

Box-2. Marketability of Soybean Products

Timor-Leste has assorted food culture influenced by East Asian and South East Asian culture including Chinese-Macau and Indonesian foods. Therefore, Timorese people prefer to eat *Tofu* and *Tempe*, and sold in markets in Dili. Soymilk is a drink to intake vegetable-based protein easily. Considering demands of soybean products, it is possible to expand soymilk business especially at Dili. In the global markets, consumption volumes are increasing in China and South East Asia. By type of processing, the growth of Ambient Ready-To-Drink type shows remarkable rise in Compound Annual Growth Rate (CAGR), because this type drink can be stored at the ambient temperature.

Global Consumption of Soymilk Based Drinks

Type and Year	2005	2006	2007	2008	2009	CAGR
Ambient Ready-To-Drink	12.3%	12.6%	13.2%	14.0%	14.3%	7.08%
Chilled Drink	7.6%	7.9%	8.1%	8.5%	8.4%	5.73%
Flour	23.6%	23.8%	24.3%	22.7%	22.5%	1.91%
Loose (bulk)	56.4%	55.5%	54.5%	54.8%	54.7%	2.39%
Total Production (billion liter)	13.68	14.22	14.85	15.13	15.49	Average 05-09

Source: Tetra Pack Presentation 'Soya the next wave', 2010

The consumption rate of soymilk per capita annually is 16.7lit in Hong Kong, 11.8lit in Singapore, 10.2lit in Thailand, 8.4lit in Malaysia, as well 4.2 lit in Vietnam. Assumed consumption at 1.0 lit/person/year in Timor-Leste set as a target, there is possibility to create a market at 1.5 million liter equivalent to approximately 400,000 tons in dried soybean. Furthermore, the particular markets targeting school pupils and solders out of general consumers, who require more protein.

3-3 VALUE-CHAIN IMPROVEMENT FOR SOYBEAN PRODUCTS (Local Small Marketing Area)

3-3-1 Activity and Implementation Organization

(1) Activity

Main Activities consist of "Conducting contract farming between soybean processors and soybean producers", "improvement of farming technology of soybean producers (applying organic farming method such as organic compost, organic fertilizer, and wooden charcoal vinegar)", and "Introduction and extension of tempe processing technology to women's producer group". Under each main activity, following supporting activities and economic activities were conducted.

1) Supporting Activity

Supporting Activity 1 Total Management

The study team assisted Bobonaro District Agricultural Office to identify local NGO expertized in agriculture and to discuss soybean production in the district. The study team expert visited on soybean farms and selected one farmers group to collaborate. Finally, detail activities were decided.

Supporting Activity 2 Human Resource Development

The methodology was discussed organic farming technologies applicable to famers. The consigned NGO (Organisium Haburas Moris) has reliable relationship with the specified farmers groups through working experiences with GTZ RDP2. Therefore, it was expected that the NGO can transfer farming technologies smoothly.

Supporting Activity 3 Technical Improvement

In order to practice organic farming, it was focused the following technologies; compost making using micro-organisms for soil improvement, development of traditional natural pesticide using herbs and medical plants growing naturally for pest control and production/ application of wooden charcoal vinegar for crop diseases caused by fungi and virus.

Supporting Activity 4 Procurement of Materials and Equipment

The study team assisted to procure FRP tank to multiply micro-organisms as a fermentation starter installed in NGO office compound, substrate materials for multiplication and charcoal vinegar mini-plant at 4 site in village centers. Soybean seeds to distribute to the target farmers procured by NGO from Maubisse and Bobonaro.

2) Economic Activity

Main Economic Activity 1 Commodity Development Planning

The study team expert and NGO focused on *Tempe* production and transfer processing techniques to women's group in village for important source of protein, which is insufficient nutrient in rural areas. After harvesting surplus, soybean can be sold to the processor in Dili for income generation.

Main Economic Activity 2 Raw Materials Production

In 1st year, the problems on cultivation of organic soybeans at 1 site (2ha), and then, in 2nd year, the target areas were expanded to 5 sites (25ha) according to the requests on planting of organic soybeans from *Suco* or *Aldea* village chiefs. The NGO staff multiplies micro-organisms for compost making,

provides farmers groups and instructs to farmers. Natural pesticide and wooden charcoal vinegar were produced by NGO at villages under consultation of the study team expert.

Main Economic Activity 3 Post-harvest and Processing

The NGO guided classification of soybean grades in terms of removal of impurities, immature bean and damaged bean and drying sufficiently at less than 12.5% moisture contents in beans. For processing of *Tempe*, the NGO and Indonesian consultant instructed quality fermentation and multiplication of fungi of *Tempe*.

Main Economic Activity 4 Marketing and Sales

For transaction of dried soybeans between farmers groups and the processor, the trading volume in one time should be more than 1,000kg (equivalent US\$700-1,000) for efficient transportation. The famers in uplands and slop lands possess only 0.1-0.5ha/household in the most of areas in Timor-Leste, thus it is desired joint-shipment by group or village from the viewpoints of buyers. The leaders in groups or villages should have capacity on transaction to arrange members with understandings on grading. For the project, the NGO controlled quality and act as a transacting agent representing farmers groups.

(2) Implementation Organization

Implementing body	: DNPIAC
Technical assistance	: OHM (Organisoun Haburas Moris; NGO): contract farming, soybean cultivation, post-harvest, marketing and tempe production Bobonaro district agricultural office
Monitoring	: OHM, Bobonaro district agribusiness officer, DNPIAC
Related organization	: Sub-district and suco agricultural extension workers
Target group	: Soybean Producing Farmers: 1 group (35 farmers) in Miligo, Cailaco sub-district 3 groups (80 farmers) in Maleubu/ Tebabui/ Karabau, Bobonaro sub-district Target Areas: 1 st year 2ha, 2 nd year 25ha Tempe Producing Women's Groups: 1 group (22 women) in Atanbul, Maliana sub-district 1 group (15 women) in Miligo, Cailaco sub-district

3-3-2 PDM, Activity Process and Monitoring

(1) PDM

PDM is shown in Table 3-3-1.

(2) Activity Process

Problems arisen in the activity process and solutions/ measures taken are summarized as follows.

Activity	Working progress	Problem	Measure
Strengthenin gof organic faming	- Materials to make organic farming without chemical fertilizer are provided and produced as follows. After made, those were applied in the field. Related NGO started to sell them.	- Harmful insect (<i>Riptortus clavatus</i>) was broken out. Charcoal vinegar and natural pesticide (made by natural plants) were applied, so that shrinking damage was	- If soybean field is adjacent to the paddy field, it could not prevent the pests frying to the soybean field. - During wet season, fields are used as paddy fields with poor drainage condition. For next cultivation, fields may move into the gentle slope area in the mountainous side for

	<p>Materials made: Micro-organism liquid fertilizer; 1st year 750lit, 2nd year 750lit Fully fermented compost; 1st year 30ton, 2nd year 60ton Wooden charcoal vinegar; 1st year 10lit, 2nd 30lit Natural pesticide; total 30lit</p>	<p>prevented by about 20 %.</p> <ul style="list-style-type: none"> - Soybean was cropped as secondary crop. It was poor crop because of unexpected long-term heavy rainfall. - Organic farming technology was transferred to related farmers smoothly. But all farmers were not followed by NGO's instructions. 	<p>prevention measures of the harmful insect and poor drainage.</p> <ul style="list-style-type: none"> - Charcoal vinegar should be sprayed at suitable flowering time. Soybean seed should be changed from Bobonaro produced one to Maubisse produced one to maximize natural farming effect. - District extension worker and district DNPIAC staff were requested to join the specific activity occasions. But their participation is few. It is necessary to consider any useful measures to involve them in the project activities.
<p>Improvement of post-harvest, processing and transaction</p>	<ul style="list-style-type: none"> - Multiplication technology of tempe germ (<i>Rhizopus oligosporus</i>) was transferred to two processing women groups. And, improvement method of tempe producing was also transferred. 	<ul style="list-style-type: none"> - Transferred multiplication method was the local adoptable technology for women groups, because of making use of local resources. - Sales to outside areas and within villages for tempe consumption are promoted. 	<ul style="list-style-type: none"> - Tempe producing techniques were transferred to women group in Maubisse (PARCIC group) by OHM. - OHM instructed women groups for promotion of tempe consumption. - Contract farming involved in the processors in Dili was promoted for soybean producing farmers to ensure the marketing channel. The farmers learned quality standard regarding contamination of impurities, damages on surface of soybean and drying conditions.



In Bobonaro district, stinkbugs (such as *Riptortus clavatus*) were broken out by heavy rainfall from July to August, 2010. The photo was taken in fields out of the pilot project, but it was controlled in the target farm. Lower photo shows egg-laying on the back leaf. It becomes an imago after one month. Existence cycle of stinkbugs is short, but it is explosively multiplied. It is important to prevent from it in the beginning stage.

Soybean was cultivated at 2 ha in the target farm owned leading farmers in 1st year. Yield was the 600kg/ ha. It is expected to get higher yield than this, if prevention measures from pest would be applied and land conditions such as drainage could be well managed. Harvesting festival was opened by farmers. Administrative officers such as district agricultural director and *suco* village chief were invited. This event was broadcasted by local community radio. It seems that surrounding local farmers are motivated to crop soybean with natural farming soybean through this event.

Structure of wooden charcoal vinegar mini-plant was designed by the study team. Necessary materials were procured by NGO. The farmers were constructed. Dropped water including organic acid through burning wood are collected in the low position of pile. This method is originally developed by the leading apple farmers in Japan.

		
<p>Multiplication technology of <i>tempeh</i> fungus was conducted in the on-the-training. Trainer was invited from food science faculty of poytechnic in West Timor. It can be reduce procurement cost equivalent to 10% of <i>tempeh</i> production cost. The key issue was dificulty on procurement of the fungus. Now, <i>Tempeh</i> can be produced at any time.</p>	<p>The tools to multiply <i>Tempeh</i> fungus are easily obtained. Skill to do the process is likely to be local adopted technology to women in rural area. When training, two methods were introduced. One is the way using available <i>tempeh</i>,and making powder. Another is the way to multiply selling <i>tempeh</i> fungus powder made in Indonesia by steamed rice.</p>	<p>Making method of compost is trained by on-the-job training. Study team conducted the training. Dunk of cow and goat is the baic material. Leaves of <i>Chromolaena odorata</i> and <i>Gamal</i> were mixed. It was fermented by pouring micro-organisms solutions multiplied in anaerobic conditions. Compost was fermented in a month. This activity was expanded by NGO participated in the training. The NGO sold produced compost 50 ton (US\$9,000) to DNAH, MAF since October, 2010.</p>
		
<p>100 times solutions of natural pesticide were sprayed in the flowiering stage. For natural pesticide, local plants such as Tabacco leaves, <i>Chromolaena odorata</i> and <i>Gliricidia maculata</i> are effective. There was pect attack by moth catabillars (<i>Mamestra brassicae</i>) in April, 2011, but the damages were limited. Some group could not grow well due to delay of seeding and longer rain season in hills.</p>	<p>Powdery mildew appered in May, 2011 and expanding in Maleubu village. The farmers udner instruction of OHM sprayed chacoal vinegar and natural insecticide in order to depress filamentous fungi. OHM is planning to open 'Buras Moris Organic Farming Technology Center' in Maliana Sub-district by their funds to demonstrate usage of micro-organism, chacoal vinegar and natural pesticide . The running costs will be covered sales of compost to private companies such as Timor Global, which are promoting organic products.</p>	<p>Using <i>Tempeh</i> fungi multiplied by OHM, they tested to produce 'Mung Tenpeh'. Mung beans are very common crops also. The <i>tempeh</i> is not well fermented with skins of bean (upper one pack). In case of removing skins, the <i>tempeh</i> was fermented well (lower 4 packs). The taste is delicious and acceptable by anyone.</p>

Table 3-3-1 PDM for Value-chain Improvement of Soybean Products (Local Small Marketing Area)

Project Name: The Pilot Project for Value Chain of Soybean Products (Local Small Marketing Area)
 Target Groups: Miligo Farmers' Groups (Cailaco, Bobonaro District), Maleubu/ Tehabui/ Karabao Groups (Bobonaro Sub-District, Bobonaro District), Women's Groups in Cailaco & Maliana in Bobonaro District or other possible sites

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal</p> <p>Market channel of domestic produced soybean is established through improvement of value chain of soybean.</p>			
<p>Project Purpose</p> <p>Value chain of organic soybean from production to sales of processed products is constructed in a local marketing area.</p>	<p>Cash flow among farmers' groups. 1st year 660US\$, 2nd year ***US\$ Number of supplied farmers 1st 10 farmers, 2nd year*** farmers Tonnage of soybean (dry base) 1st year 1.1.ton, 2nd year *** ton</p>	<p>Interview to farmers' groups</p>	<p>Unexpected heavy rain, flood or low temperature in dry season does not occur. But, it was heavy rain from 1.2011-4.2011 due to climate change in upper lands.</p>
<p>Output</p> <p>1) The farmers' groups learn organic cultivation of soybean. 2) Nutrient products of soybean are developed for self-consumption and sell markets in Suco or Sub-District levels.</p>	<p>1) Estimation of yield and quality of soybean 1st year 600kg/ha, 2nd year ***kg/ha 2) Sold amount and quantity of soybean products (Tempe) 1st year 1040 packs, 2nd year***packs (***)US\$), (390US\$),</p>	<p>1) Interview to the farmers and the processor 2) Records of transaction between the farmers' groups and the processor 3) Interview to the processor 4) Records of the processor</p>	<p>International prices of soybean do not decrease rapidly. The prices increase from 348.95US\$/ton in 4.2010 to 501.48US\$/ton in 4.2011. Famine does not occur in the target groups, but prices of beans increases at 2-300% due to shortage of supply. Pests do not affect in large-scale impact, but long rain affects on sting bags.</p>
<p>Activity</p> <p>1) Soybean cultivation 1-1) NGO purchase and distribute soybean seed to the farmers' group. 1-2) Training to farmers to produce and apply organic inputs such as beneficial micro-organisms, charcoal vinegar and compost 1-3) NGO train farmers to control pest using natural pesticide. 2) Improvement of Tempe manufacture process 2-1) Specialist teaches multiplication technique of Fungus Tempe to women's groups. 2-1. Women's group produces and sells produced Tempe.</p>	<p>Input</p> <p>Study Team Side</p> <p>Personnel</p> <p>Processing expert Resident supervisor Purchase of soybean seeds JICA study team members (Advisor on organic fertilizer)</p> <p>Facilities and Materials</p> <p>Materials and tools of organic pesticides, charcoal vinegar and organic fertilizer</p>	<p>Local Side</p> <p>Personnel</p> <p>MAF Agricultural extension workers MAF Agribusiness officer (seed purchase arrangement)</p> <p>Facilities and Materials</p> <p>Local available material for making organic fertilizer and pesticides</p>	

3-3-3 Final Evaluation

(1) Implementation Organization in the Activity Process

As for holding on-the-job training such as improvement of cropping technology, related staff of district MAF office was called to participate in the training. However, there is few positive participated. Viqueque district extension worker was invited in on-the-job training on the skills how to make and spray natural pesticide which is made from natural herb and medical plants. After the training, trained extension worker was transferred the learned skills to soybean producing farmers. Related district extension workers are encouraged to participate in the training.

Local NGO (Haburas Moris) facilitated well the planned project activity as the technical supporting group. The NGO worked with soybean producing farmers groups and processing groups. The NGO found target farmers groups and processing women groups and encouraged them to participate in the project. The NGO is trying to expand their business activities based on the cropping technology learnt from the training organized by the Study Team.

For implementation of the project, the most important activities are to support seed distribution, quick treatment of pests and post-harvest. For extension of farming technologies, farmers wish to watch successful cases, otherwise, farmers might not accept anything. When implementing at new sites, the process to start from small plots is essential for involving people.

(2) Final Evaluation

Items	Final evallutaion
Validity (Score: 4)	It is important for food security in rural area to promote cropping of various crops such as maize, cassava, mung bean, soybean and sweet potato. Among those crops, soybean production can be effective to make nitrogen fixation in the cropped land. It is not easy for farmers to procure chemical fertilizer and pesticide. Under such conditions, soybean is the core crop to make crop rotation. As for promotion of soybean production, technical problems in developing natural farming method were discussed and solutions were practiced by making use of local natural resources. It was clarified to be important to survey natural conditions of target lands to select suitable cropping land. Approach taken in the project meets with the farmers' needs to make soybean production stable. Processing technology of soybean products is not developed in the rural area. Technology to multiply the tempe bacillus was introduced in the project. This technology contributes to manufacturing tempe made from the multiplied bacillus and selling it as high quality and cheaper price tempe. Although improvement of value chain in this project is limited into small area, it is obvious that the project contributes to realization of food security in the area. Approach to improving value chain of soybean is acceptable for local people. Considering these, it is judged that the validity is high.
Effectiveness (Score: 4)	Improvement of cropping technology is the key subjects arisen in the value chain improvement process. To cope with this, strengthening natural farming is the basic requirement. Then, cropping technology was practiced in the area. Although the production area was damaged by flood, introduced cropping technology was effective. Under the current condition that farmers can not procure easily and timely chemical fertilizer and pesticide, related farmers learned the way how to manufacture natural pesticide and organic compost and apply them in the fields. They observed its effect on the fields. This cropping may bring to improvement of value chain. Participated farmers

Items	Final evaluation
	<p>obtained skills and knowledge, and had confidence in themselves. They can get prospects for selling produced to soybean processor in Dili. Those processes taken in the project have an effect on the achievement of overall goal. Production yield is low at 600 kg/ ha. However, it is expected to increase its production by applying learned technology include in the way how to make and spray charcoal vinegar and selecting suitable production fields.</p> <p>Tempe was manufactured by using imported tempe bacillus so far. By introducing a new skill which can multiply the tempe bacillus, it was provided that high quality tempe could be manufactured at cheaper cost than the usual one. This activity also contributes to improvement in the processing stage of value chain of soybean. It can not be surveyed to count sales amount.</p>
<p>Efficiency (Score: 4)</p>	<p>Inputs to strengthen natural farming method are the necessary and available tools to multiply organic materials, available natural herb and plants to make natural pesticide and available local materials to construct necessary facility to extract charcoal vinegar. Those can be collected easily from in/around the area and made at cheaper price. The technology is adaptable to the technical level of soybean producing farmers. Those were practiced through on-the-job training. Outputs were observed to be positive.</p> <p>As for the tempe, skill to multiply tempe bacillus is also adaptable for processors and local women. It is suitable to the learning capability and knowledge of them.</p> <p>Considering these performance so far, it is judged the efficiency is high. Produced soybean produce and tempe are not marketed fully. The efficiency can not be evaluated yet in this study period.</p>
<p>Impact (Score: 4)</p>	<p>Soybean farmers targeted in the project are the groups of 35 farmers in Cailaco sub-district of Bobonaro district. Surrounding non-target farmers got project information from NGO and targeted farmers. And, they were observing the performance. By observing outputs, they decided to request the study team to join pilot project and start soybean production. The request is prepared by total of 94 farmers, 29 ha from 3 suco of Carabau, Tebabui and Maleubu. Like this, soybean producing farmers are expected to increase through showing project performance.</p> <p>As for tempe, two women groups in the sub-district of Cailaco and Maliana are designed as target processor. Tempe production of each in the past amounted at zero in Cailaco and 200 bags in a week. It is expected to increase the production amount. Requested farmers also expect to start manufacturing tempe.</p>
<p>Sustainability (Score: 3)</p>	<p>Cropping capacity of targeted farmers is being improved. In order to ensure sustainability, it is necessary to deepen and fix the organic farming technology into the target areas and disseminate it to other related area. To do so, extension workers should act as key persons. Project provided training opportunities for stakeholders including NGO and extension workers. But, few extension workers participated in those opportunities. Extension workers could not have learning opportunity so far. It is necessary to improve their capability and knowledge to promote natural farming technology. It is also important to build up successful area cooperated with extension workers. Mobilization and training of them should be realized in cooperation with RDPII. It can be said that transferred producing technology of tempe included in multiplying tempe fungi is the adaptable skill for tempe processors. Future project activity should be monitored to find problems and solutions, in order to ensure sustainability of this tempe production activity. The required</p>

Items	Final evallutaion
	roles for MAF will be to assist farmer regarding seed supply, pest control and organic farming.
Total Score: 19	

3-4 EVALUATION OF THE VERIFICATION THEME

(1) The Possibility of the Contract Farming between Soybean Processors and Domestic Soybean Producers or Soybean traders.

Pilot project verified that contract farming between soybean farmers and soybean processors was successfully conducted. It was also confirmed that DNPIAC, district agricultural office and related NGOs could act as mediator. However, it was observed that there are subjects to be tackled in order to make the contract farming sustainable.

Soybean cropping technology of the contract farmers is generally low. For soybean processor, the objective of the contract is to procure raw materials to manufacture their processing products through the contract farming. Procurement of raw materials crop is largely dependent on crop production. Occurrence of crop failure and low cropping technology may give negative influence in manufacturing products of processors. (In the pilot project, soybean production was dropped in not only the contract farming area, but also the other areas because of flood occurrence caused by unexpected long term rainfall. Low soybean production was also caused by low cropping technology of farmers. It was urgently required to expand the contract farming area to other districts so as to bring raw material soybean to the targeted level. Cropping technology is trained to the related farmers in the newly contracted sites.) It is indispensable to support the contracted farmers in improving their cropping technology through on-the-job training as executed in the pilot project.

Soybean is one of the target products of the government purchasing system. Stakeholder understands that the purchasing price set by government is the market price, and farmers recognize that it is the minimum shipping price. In the beginning stage of the contract farming, it is agreed usually that processors will purchase harvested soybean based on the current market price. In the normal year, it is expected to get stable production. However, in case of crop failure like the last year, market price tends to jump unexpectedly. It jumped suddenly in the last year. At that case, processor was forced to buy at higher price than the expected. It may occur in the crop failure season that any contract farmers having less contract sense will ship to the traders or middleman who offered higher farm gate price than the market price. Drastic fluctuation of the market price is an unstable factor to make the contract farming continuous. It is required to support contracted farmers in improving their farming technology. Supporting their cropping technology is also crucial even to avoid decrease of production brought form crop failure.

(2) The Process of Supporting Soybean Processing Industries.

Pilot project supported processors and processing groups in developing new product; soymilk, and manufacturing tempe. Both products are selling smoothly after manufacturing stages. Therefore, those supporting processes were considered to be effective.

As for development process of soymilk, pilot project supported a series of activities from procurement of the processing machine, making trial manufacture, to the sales promotion. As the results, soymilk

could be put on the market. Selling activity is going well. As for procurement of the processing machine, study team provided financial support for the sterilizer. In general, financial capacity of processors in this country is very weak. It is required for processor who will to challenge to develop new products and improve their processing works to provide a kind of financial supporting system such as subsidy system, long term credit system and lending system of machine and equipment.

Tempe manufacturing skill was transferred to the women groups. Transferred skill is the local adopted simple one by using local materials so that they can easily obtain in the local area. Supporting process was well done. Processing group learned the skill started to sell the manufactured tempe.

3-5 LESSONS LEARNED AND FEEDBACK TO THE ACTION PLAN

Effectiveness of the Draft Action Plans was verified based on the implementation process and outputs generated. Lessons are also learned from the pilot projects implementation processes, and obtained lessons learned are supposed to incorporate into the finalization of the Action Plans. Consideration of the lessons, experiences and verification were compiled as follows.

3-5-1 Establishment of Seed/Input Materials Supply System

Verification	<p>The purpose of this project is to support production activities of the agribusiness target crops. The project deals in supplying seed, inputs materials and includes operation and maintenance of agricultural machinery. In the pilot project, seed supply system was practiced.</p> <p>At present, as for seed supply, MAF is supposed to procure and distribute seeds to farmers. Seed is generally obtained in three ways: 1) import from Indonesia, 2) FAO program and 3) Seed of Life project who deals the seeds of paddy, maize, peanuts, sweet potato and cassava. After procurement, MAF distributes to related districts and sub-districts based on the requests from them. It is said that the MAF distribution system is not fully functional. It is reported that face of the problems are: not enough quantity as requested; seeds often arrive at the farmers too late to plant; some seeds often deteriorated and not germinated. Under such conditions, some farmers multiply seed by themselves. In this case, they tend to hesitate to spread their produced seed to other farmers since they want to keep it for their farming. Considering such conditions, necessary seed should be multiplied based on the target crops. Seed collection should be taken by crops. It is required to focus on agribusiness target crops.</p> <p>Related to soybean seed, it is said that special care is needed to manage it as cool storage as required. Consequently, FAO and Seed of Life have stopped to deal with the seed.</p> <p>Under such conditions, this project component was practiced in the pilot project. Project activity was taken to multiply soybean seed and distribute to soybean producing farmers. Effectiveness of the soybean seed supply system from multiplying to distribution was verified through this activity.</p> <p>In the first stage, it was surveyed where is the appropriate farming area to multiply soybean seed, based on the information from DNPIAC, private processors and traders. Selected candidate sites were surveyed to observe actual conditions including seed quality. As a result of the survey, Maubisse of Ainaro district was selected for seed collection. As the next action, soybean farmers were found in the Maubisse area through interview survey with farm land and they were requested to produce the seed. After production and collection of seed, it was distributed to contract farmers in Viqueque, Manatuto and Bobonaro. After distribution, test fields were provided so as to test effectiveness of the seed. Two sources of Viqueque locally</p>
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	<p>produced seed and Maubisse produced seed were planted in the test field. Both growing was compared. Compared with them, the growing by Maubisse produced seed was better than the Viqueque. For soybean seed production, it is found that Maubisse is the appropriate area to multiply soybean seed.</p>
Lessons learned	<p><u>Seed is procured by agribusiness target crops, As for soybean seed, Maubisse produced seed can be distributed to production farmers.</u></p> <p>In Timor-Leste, reliable seed supply system for agribusiness target crop is not established yet. In the case that target seed can not be provided through present seed supply system, it should be procured from production farmers. Seed for agribusiness activity is generally provided by agribusiness target crops. As for soybean seed, Maubisse produced seed shows good growing. It is suitable to procure from Maubisse's production farmers, After procurement, collected seed can be distributed to agribusiness target farmers.</p>
Feedback	<p><u>Natural land condition and cropping methods should be surveyed to find seed multiplication areas and farmers, in the case that seed of the target crop can not be procured from the present seed supply system. As for soybean seed, Maubisse is the most suitable area.</u></p> <p>Seed multiplication area should be selected by undertaking the following process: to study special growing properties of the target crop; to select candidate areas from related information; to survey natural conditions such as weather, temperature during the growing period, soil, water supply and drainage conditions; to interview with farmers about cropping methods, cropping periods and intention of farmers; to select suitable areas from these results. (As for soybean seed in the pilot project, it was considered that Maubisse produced seed was suitable. As the results, Maubisse seed was planted for promotion of contract farming in the pilot projects.)</p>

3-5-2 Strengthening of Dissemination System of Cropping Technology

Verification	<p>This project is to improve cropping technology of agribusiness target crops in quantity and quality aspects. The agribusiness target crops are used as raw materials for next processing and marketing. Natural farming method is characterized in Timor-Leste. Cropping technology based on natural farming is expected to disseminate to the related area through extension staff. (Promotion of organic farming is recommended in the Timor-Leste's Strategic Development Plan (2011-2030), Office of the Prime Minister April 7, 2010)</p> <p>Extension workers are allocated to district, sub-district and suco levels. But, dissemination activities are not undertaken systematically. There is no systematic training program for them. Participation in the projects/ plans organized by international aid agencies and other donors is the only training that can improve their practical capability.</p> <p>In this pilot project, training on cropping technology was provided for soybean farmers, district extension workers and related NGO. Effectiveness of this activity was verified through the training process in the sites and extension works after training. Trained subject was the way how to make organic fertilizer and organic pesticide, and how to spray them. The training objective is to strengthen natural farming methods. Effectiveness of the natural farming was also verified by observing the training outputs.</p> <p>In the training, manufacturing method of organic fertilizer, organic pesticide and charcoal vinegar and its spraying method were practiced. Training was conducted in the target site of the Mariana sub-district. Viqueque district extension worker was also invited. (It was expected that Viqueque extension worker tried to disseminate learned technology to related soybean production farmers in his district.)</p>
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	<p>In the training of organic pesticide, local variety plants such as leaf of tobacco plant, <i>Chromolaena odorata</i> and <i>Gliricidia maculate</i> were used. Used plants and materials were available around the area. Manufactured organic pesticide was sprayed in the soybean fields. It was observed to be effective against the crop damage caused by harmful insects. As for the organic fertilizer, microorganism which can be procured in the Dili market was used. It was multiplied in the site, and sprayed in the field. It was confirmed to develop its root zone than the crops not applied.</p> <p>After learning technology, Viqueque extension worker participated in the training transferred to soybean production farmers in Viqueque. Judging from the working process, it was considered that extension activity by him was effective, but, such extension activity was not continued. It was considered that training activity should be repeated so that related farmers could understand the effective technology for their farming. On the other hand, in the Mariana, trained OHM (NGO) took follow-up activity to the targeted soybean farmers. As the result of the repeated training activities, farmers could harvest the soybean to a certain extent. Activity processes from cropping to harvesting were introduced to the district agricultural office, and demonstrated to local people by local radio. After such extension, 22 farmers groups who touched such progressing information about the soybean production, requested the Study Team to receive the technology transfer, join the project and begin soybean cropping. In response to this, They joined the contract farming. Same training on organic fertilizer and organic pesticide was executed in their farming sites. Although there was new occurrence of harmful insects, cropping is continued. Promotion of the cropping technology led by the project just started. Although there is the face of the problems, Judging from a series of the training and extension activities, effectiveness of the project was verified.</p> <p>As the background that farmers are expecting cropping technology transfer, it was said that district extension workers have not enough technology to teach to the farmers. Farmers experienced crop damages in the last year's similar projects. They could not harvest the planted crop, since district extension workers did not train farmers about necessary cropping technology and skill after distribution of seed. As the result, farmers' planted crop was damaged by harmful insects so that they could not harvest. Damaged farmers have complained about this harvest loss to the district agricultural office. On the other hand, pilot project could minimize the damage by applying organic fertilizer and organic pesticide learned in the training. Farmers could harvest a certain extent, although it was not reached to the targeted level.</p> <p>It was verified through the training and extension activities that organic farming method was effective to ensure stable production in quantity and quality of agribusiness target crop. As for extension system, however, it was judged that extension activity was not too intensive to fix it on the related farmers. On the other hand, OHM's extension activity was effective. Learned technology was put repeatedly on the farmers. OHM learned from the training, practice and outcome in the field. OHM found that obtained technology would be available in Mariana. OHM began to make organic fertilizer and organic soil to extend them to farmers. (DNAH, MAF, contracted with OHM to purchase the organic soil to test its effectiveness on that soil and confirm the effect. Judging from this contract, it is considered that making organic fertilizer and organic pesticide and selling may be the new agribusiness.) In order to make future extension activity effective, it is effective to make use of OHM in cooperation with district extension workers.</p>
Lessons	<u>In order to strengthen natural farming methods, application of organic fertilizer and organic</u>

learned	<p><u>pesticide are effective for crop growing.</u></p> <p>In Timor-Leste, chemical fertilizers/pesticides are imported at a high price. In addition, it is not easy for farmers to purchase them. Organic fertilizer can be made from surrounding local materials/ natural resources and microorganism. Organic pesticide can be extracted from well-distributed medicinal herbs and plants such as tobacco, pepper and garlic, etc. Both are effective to help crop growing and prevent crop damage caused from harmful insects. These technologies are likely to be effective for labor-intensive crops on small plots such as soybeans and vegetables.</p>
Feedback	<p><u>DNPIAC as the mediator between related farmers and district extension workers, work out to disseminate organic farming technology including making organic fertilizer/ organic pesticide and spraying them. In the sites, it is effective to make use of NGO who learned know-how in this project.</u></p> <p>DNPIAC arranges training and extension activities included in making organic fertilizer and organic pesticide and spraying them for strengthening natural farming. DNPIAC acts as a mediator between farmers and extension workers. District extension worker have some constraints such as lack of technology and knowledge. In order to train farmers, it is effective to make use of OHM who learned know-how in the implementation process of this pilot project. It is proposed to exhibit the pilot project sites in Boborano district as the center of technology transfer and extension activity.</p>

3-5-3 Promotion of Contract Farming

Verification	<p>This project is to promote "contract farming" in which an agribusiness target crop is cultivated based on the "contract" between processors/ traders and crop producing farmers. The objective of this project is to ensure quantity and quality of the agribusiness crops. It is expected in the Draft Action Plan that administration staff serve as mediators for contract between them. The mediator plays to find agribusiness target crops, producing farmers and processors/ traders, make linkage with them and guide the contract farming.</p> <p>Conduct of this contract farming was practiced as one of component in this pilot project. Effectiveness was verified through the pilot project implementation. Implementation process to be verified was designed in the following working flows; 1) to find farmers groups of soybean production based on the various information; 2) to explain the working processes of the contract farming which is to contract the soybean production, distribute the seed, cultivate and harvest the soybean and purchase it. After contract agreement, contracted farmers group begin the cultivation. Effectiveness of those processes was verified in the 1st and 2nd year surveys.</p> <p>An important point to lead the contract farming was the farmers' understanding about 'contract' sense. Timorese farmers were practicing self-sufficient farming. They are unfamiliar with an action of contact. In general, farmers' understanding level to contract the farming is generally low. For example, it is said that, despite famers already contracted with buyer, there was the local case which they sold their products to the middleman or trader if he would offer higher price at the farm gate. It is said that such situation often occur even in the east region where commercial agricultural sense is gradually infiltrated among farmers. Finding target farmers' group was forward considering such situation. In addition, it was concerned that most farmers might be unfamiliar with reading/ writing and calculating. Activity process in this project was taken in the two years as follows.</p> <p>In the 1st year survey (2010), target farmers group for contract farming was selected from</p>
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Viqueque district. Candidate farmers group was found based on the information from DNPIAC, district agricultural office and processors. The farmers group was selected finally through the interview survey to confirm their intention with site survey. In the action of 'Contract', oral style was taken since farmers group was not familiar with document style, and this trial was the first challenge for farmers and processors. In the contract process, processors offered orally to purchase the soybean product at the market price. After agreement of the contract, seed was distributed and cultivation was begun. Cultivation was progressed smoothly. But, the production in the 1st year was damaged because of inundation damage by flooding with unusual long term rainfall, and outbreak of harmful insect. (A few amount of production was harvested. Some of them were stored as next cropping seed. Consequently, target area of contract farming was planned to extend to six 6 farmers groups who joined in the activity. Soybean was cultivating.) Due to the production damage in Viqueque, it was urgently required to find new contract farmers. Same process as mentioned above was taken. As the results, farmers group was selected from the Natabora sub-district in Manatuto district. Agreement was made and farming was practiced. In the first year, processors purchased total 1.1 ton from contract farmers after testing (some of them were stored for next cropping).

In the 2nd year survey (2011), farmers group was selected from Bobonaro district. Selection process was as follows; farmers group got information that soybean producing in Miligo village of Cairaco sub-district has better than that in their area, so that, they requested to participate in the pilot project. In response to this request, it was agreed to join this contract farming. It is judged from this extension process that contract farming would be effective. Same approach as in the 1st survey was taken in the contract process for them. Prior to the seed distribution, the 'contract farming' process was explained to the target farmers in the production sites. Processor explained in the process that harvested soybean would be surely purchased to manufacture soybean products such as tofu and soy milk. If good production results would be obtained from this farming, the contract farming would be continued in the next season. After agreement made, seed was distributed and cultivation was begun.

Background that new farmers groups joined to this contract in Bobonaro district was as follows. Last year's soybean cultivation was also conducted in Manufafi and Bononaro districts through the similar project. The production activity was not so practiced well as the pilot project, since no technical supporting activities taken on the farmers after seed distributed. In addition, traders/ middleman did not purchase low quality one. In general, trader/ middleman are not reliable for farmers. On the other hand, farmers always want to get stable shipping target and cropping technology. Farmers seem that they will be able to get support in cropping and stable shipping in this contract farming, rather than the case of traders/ middleman. It is considered that most important factor for farmers when contract farming promoted is to ensure shipping. Commercial agriculture sense is being infiltrated in Bobonaro district compared with Viqueque. Farmers can understand the contract farming method. Cultivation was started after seed distribution. Although there is a production damage caused by outbreak of harmful insects, cultivation is now on-going.

Through the activity process of the contract farming mentioned above, soybean processor could procure raw materials for target product, soymilk, to some extent. Although its quantity was not enough as planned, judging from conducted activity process, it was considered that this project was effective. Contract farming is effective to make processing operation stable since processor can procure raw materials stably. Contract farming is established through making linkage the processor with the farmers group. Processor will be able to estimate the production through

	<p>monitoring farmers' cultivation progress. As the result, processor will be able to make business operation smooth. As the problem, however, it is point out that farmers' cultivation technology does not reach at satisfying level to produce in required level. It is necessary to implement the project 'Strengthening of Dissemination of Cropping Technology' together with this contract farming.</p>																		
Lessons learned (1)	<p><u>Contract farming should proceed flexibly taking into consideration the farmers' contract sense.</u></p> <p>In conclusion, it is desirable to make an agreement in the document form. In general, however, most farmers in Timor-Leste have been practicing self-sufficient farming. They don't have full understanding capacity of the 'contract'. Furthermore, some local farmers are not familiar with reading and writing of documents. In cases where contract farming is led by farmers group who has no experience to make documents, it would be possible to make an oral contract. However, both parties, farmers and processors, would need to agree for the produced and purchased crops which quality standard is acceptable to the processors/ traders and would be bought and sold at market prices. Flexibility would be needed to form contract farming. It is desirable that both parties create contract sense by accumulating experiences.</p> <p>In the 2nd year, contract farming was tried through NGO (OHM). OHM acts as mediator between processors and farmers groups. Discussion process was compiled as simple document for both parties, OHM and farmers group (representative is the village chief). This agreement can be referred to the next case of contract.</p> <table border="1"> <thead> <tr> <th>OHM responsibility</th> <th>Farmers group responsibility</th> </tr> </thead> <tbody> <tr> <td>Supply soybean seed</td> <td>Prohibit to resell seed</td> </tr> <tr> <td>Guide grading soybean at shipping</td> <td>Execute sun-drying and sorting soybean</td> </tr> <tr> <td>Construct facility to extract wood vinegar</td> <td>Make wood vinegar and spray it</td> </tr> <tr> <td>Supply microorganism materials to make compost</td> <td>Make compost and apply it</td> </tr> <tr> <td>Provide natural pesticide used medical plants</td> <td>Use natural pesticide</td> </tr> <tr> <td>Ship soybean to processors in Dili</td> <td>Collect at the shipping site</td> </tr> <tr> <td>Collect shipped charge from processor and pay the production cost to farmers</td> <td>Keep shipping record by farmers and share properly sales amount</td> </tr> <tr> <td>Train making tempe and supply tempe bacillus at cheaper price</td> <td>Organize women groups</td> </tr> </tbody> </table>	OHM responsibility	Farmers group responsibility	Supply soybean seed	Prohibit to resell seed	Guide grading soybean at shipping	Execute sun-drying and sorting soybean	Construct facility to extract wood vinegar	Make wood vinegar and spray it	Supply microorganism materials to make compost	Make compost and apply it	Provide natural pesticide used medical plants	Use natural pesticide	Ship soybean to processors in Dili	Collect at the shipping site	Collect shipped charge from processor and pay the production cost to farmers	Keep shipping record by farmers and share properly sales amount	Train making tempe and supply tempe bacillus at cheaper price	Organize women groups
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Feedback (1)	<p><u>For contracting, an agreement should be made in the presence of DNPIAC staff and processors/ traders, and other private groups/ NGO agreed by related persons.</u></p> <p>When contract farming is promoted, related persons including administration staff, traders/ middleman and private groups/ NGO are requested to present. In the case of an oral contract, DNPIAC staff and other related persons should prepare a memorandum of what was discussed and agreed.</p>																		
Lessons learned (2)	<p><u>Supporting activity aiming to improve cropping technology should be given to farmers groups, in order to make farm production stable.</u></p> <p>Cropping technology of farmers is low. Cropping technology should be provided for farmers so as to ensure quantity and quality of target crops as planned by processors/traders. Cropping progress should be monitored and necessary support should be given to farmers groups. (For example, improvement of farm land, strengthening of natural farming such as organic fertilizers and organic pesticides.)</p>																		
Feedback	<p><u>It is required to collaborate with the project "Strengthening of Dissemination System of</u></p>																		

(2)	<p><u>Cropping Technology", in order to ensure production activity.</u></p> <p>DNPIAC should establish a supporting organization in cooperation with related agencies/persons such as extension worker and private groups/ NGOs who participate in contract farming and are well versed of cropping. Supporting organization is responsible to support all processes of contract farming from finding interested farmers groups, planting/growing target crop to harvesting.</p>
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3-5-4 Support for Set-up of Private Processing Industry

Verification	<p>This project aims to support private processing industry in setting up and operating their processing business through supporting value adding process of the agricultural products and developing new commodity. Supporting activities by this project is largely dependent on targeted products/commodities.</p> <p>This pilot project was supporting existing soybean processors in developing new products/commodity, long life soy milk which is made from local soybean. The soybean is produced through the project "Promotion of Contract Farming".</p> <p>Soymilk development may contribute to the improvement of national people's nutritional value, if long-life soymilk can be marketed in the country. This project mainly assisted to procure necessary machinery to manufacture long life soy milk. The project also assisted to manufacture the soy milk by using the machinery. Effectiveness of this project was verified through the supporting activity processes. Projected processors were selected carefully through interview survey to confirm their willingness since manufacturing soy milk is the challenging work which has a business operational risk.</p> <p>In Timor-Leste, processing machinery and equipment required power (electricity or diesel) have to be imported. In general, such machinery and equipment should be procured by private sector's self-fund. Necessary machine for manufacturing long life soy milk is the Full water static dual-tank sterilizer, Steam boiler, Filling machine and Semi-automatic stretch machine. Out of them, most important one is the full water static dual-tank sterilizer and steam boiler. As the first step to procure the sterilizer, related information on the machine was collected from the neighboring countries and analyzed its specification. Necessary specification was decided through the discussion with the processors and traders. With comparing the specification and price, it was decided to procure from China. There is no large scale credit system in Timor-Leste. It was resultant that necessary fund was provided from the Study Team. (Negotiation with IFC was held, but, the credit was not adopted in the short time discussion. Stretch machine and filling machine are procured by the processors' self-fund.) Since no credit system for private sector provides, funding assistance and/or credit system is required. It is indispensable for private sector to procure processing machine and equipment. Introduction of machine and equipment to process the products is required to develop and improve products. To materialize the support of processing industry, a subsidy system so as to be easy to procure necessary machine or equipment should be established.</p> <p>After the procurement, this project supported to manufacture trial of soy milk. There is no cool transportation facility and cold storage in this country, and refrigerator is not use widely. The procured sterilizer is to manufacture long life soymilk through sterilization. Trial manufacture was conducted by using the procured machines, making conditions such as consuming period and market conditions under normal temperature. Quality of trials was observed by sterilizing time, and each was tested. Those trails were repeated. Out of the trails, developed one was</p>
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	<p>tentatively sold to consumers. By repeating trail and test, it was resultant that the soy milk was commercialized in the market. Manufacturing process was well operated and managed. The processor mastered driving skill of the machine and manufacturing technology of soy milk. Present manufacturing capacity was 1,000lit (500 bottles) per day, sales amount US\$325 per day (as of May). As the result of such supporting activities, long life soy milk was developed so that it can be on the market. It is judged that effectiveness of this project targeted to develop soybean product is high.</p> <p>This project encourages the processing industry to make value adding process of local soybean and develop soy milk as new marketing product. However, it is precondition for stable business operation that raw materials of soy milk, soybean, should be procured stably in quantity/ quality and price aspects. It is the important matter for processor to ensure stable procurement of raw materials.</p>
Lessons learned	<p><u>Financial support might be necessary for private sector in procurement of machine and/or equipment to make processing and marketing business easy.</u></p> <p>In general, processing and marketing machine and/ or equipment should be procured by private processors and traders own fund. But, their financial capacity of the private sector is usually very low. In Timor-Leste, there exists a small scale credit system, but, very limited to access to it. It is very hard for small processors/groups to make use of it. There is no official credit system provided yet.</p> <p>In this pilot project, the machine, sterilizer and boiler were procured under the financial assistance of the Study Team. As well as this pilot project, small scale milling machine was also provided for the pilot "Diversification of Corn Products". Processing machine and/or equipment may be needed to process target products and improve quality of them. the project tried to procure the machine through applying to the World Bank program (IFC) but, it could not reach to get finance. Provision of machine and equipment is minimum requirement for private sector. It is required to establish supporting system so that private sector can access easily to the credit. Administrative support aiming to improve present credit system of the existing micro finance institute and banks, and cooperate with international aid agency's development program is needed.</p>
Feedback	<p><u>MAF, in cooperation with MTCI and MED, should work on to the related organization to establish credit system and/ or subsidy system so that private sector can procure processing and marketing machine and equipment, For making financial support accessible, MAF should arrange with international aid agencies and related private sectors as required.</u></p> <p>Processing industry's management capacity is generally weak. As a result, it is very hard for processors to set up new business. Financial support is required. It is necessary to get financial assistance from a related organization, institute or other outside resource. MAF in cooperation with MTCI and MED should establish effective credit system including subsidy system and long-term loan system. MAF also should arrange the financial support between international aid agency's program, private sectors' investment, and processors and processing groups.</p>

3-5-5 Support for Set-up of Processing Industries by Farmers/Women's Groups

Verification	<p>This project is to support farmers' groups/ women's groups in setting up/ operating and managing agribusiness activities using locally produced agricultural materials. Supporting activity of this project is largely dependent on target crops and products/commodities as well as the project "Support for Set-up of Private Processing Industries".</p>
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	<p>In this pilot project, it was verified through tempe manufacturing activity by women's group.</p> <p>The pilot project provided the learning opportunity of tempe multiplication skill to women's groups. They learned the skill in the on-the-job training style. This activity aims to manufacture the tempe through promotion of the trained skill and sell it at cheaper price than the usual one. Through this activity process, it is considered that trained skill is the women's group adapted technology by using local materials. It is easy to be transferred. NGO who learned in the training in Maliana could transfer its skill to other women groups. Judging from these performances, effectiveness of the supporting activity in this project is considered to be high. It is expected that multiplication and manufacturing skill of the tempe is transferred to other women's groups interesting in tempe manufacture, Coffee cooperative in Maubessi, through NGOs and women's group learned in this project. Trained women group, began to sell the tempe learned to the market. Effectiveness of this project was verified.</p>
Lessons learned	<p><u>Tempe manufacturing skill is the women's group adapted technology by using local materials.</u></p> <p>Multiplication of tempe bacillus is the simple technology so that women groups can master by using local materials available. Women group can manufacture tempe at cheaper price than the original imported tempe bacillus.</p>
Feedback	<p><u>DNPIAC should transfer tempe manufacturing technology to women groups where soybean production is active and contract farming is introduced. It is effective to make use of NGO who learned the technology as trainer.</u></p> <p>In parallel with promotion of contract farming, tempe manufacturing technology should be transferred to the women group in the contract farming area. It should also be transferred to the other interesting women groups where soybean is produced. DNPIAC should arrange to set training opportunity and make use of NGOs and related persons who learned in the pilot project for its training.</p>

3-5-6 Support for Marketing Route Development

Verification	<p>This project is to support sales promotion of local produce agricultural crops and product. In the Draft Action Plan, MAF should develop comprehensive sales promotion strategy such as agribusiness fairs, use of market booths (antennae shop), promotion campaign like 'Local product-Local consumption' by means of radio and newspaper.</p> <p>Effectiveness was verified through sales promotion process of soy milk.</p> <p>Sales promotion strategy was provided from the viewpoints of consumers' five mental aspect, Attention, Interest, Desire, Action and Satisfaction. As the first, commodity name, soymilk commodity, was introduced in the newspaper. This is to infiltrate the commodity name to consumers. Labeling was put to appeal content and local products. Direct sales were started in the restaurant in Dili. After this, sales place was extended to supermarket and retail shop, and café and hamburger shop. It was also displayed in the exhibition organized by government. With such sales activity, commodity name became known to consumers. At present, commodity, soy milk bottle is selling at 50 places in Dili. It is also begun to sell in Maliana. Sales are successfully going.</p>
Lessons Learned	<p>Sales promotion strategy should be provided from the viewpoints of consumers' five mental aspect, Attention, Interest, Desire, Action and Satisfaction. By means of sales promotion activities, commodity name of soy milk become known to consumers. At present, sales amount reached average 500 bottles in day. It is successfully going by this supporting activity.</p>

Feedback	Government should undertake exhibition or agribusiness fairs regularly, in order to promote sales of domestic agricultural crops, local made products and new products by using local products developed by private sector. This contribute to the 'Local products-Local consumption' campaign
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3-5-7 Introduction of Agriculture Produce Grading System

Verification	<p>This project is to establish introduction of guarantee system for domestically produced agricultural crops and processed products. With providing this system, consumers would get safety sense to the products. As the result, it is expected to promote sales of the products.</p> <p>In this pilot project, effectiveness of this project was verified through the inspection of soybean in the purchasing time of contract farming and executed simple quality test of the soybean as raw materials for processing soy milk.</p> <p>The pilot project purchased soybean through contract farming. When purchased, quality standard of the soybean was set at 4 level (1. Excellent, 2. Good, 3. Acceptable, 4. Bad (rejected to buy) based on the standard of three items, contents of impurities, appearance (size/color, etc) and degree of dry. All items of grain were observed. As the result, 70-80% of the soybean could be purchased. Effectiveness of this project was verified in the purchasing process of the soybean from contract farmers.</p> <p>The pilot project also verified the quality of locally produced soybean products. Knowledge of the nutrient composition of the Timor-Leste soybeans is essential for correct product labeling and marketing. This information is useful for all tofu, tempe and soymilk producers. It is especially important for soymilk producer.</p> <p>There is no laboratory in-country able to determine the nutrient content of soybeans. Consequently, the laboratory test was entrusted to one of the largest soymilk producers in Southeast Asia, Ace Canning, Malaysia who is the only regional producer of organic soymilk. Ace Canning had expressed an interest in purchase of Timor-Leste organic soybeans. A soybean sample was couriered to Malaysia for testing. As the test result, major finding were; the appearance, protein and color results are very good. The protein content is very impressive. This high protein content is an excellent selling point. Clearly, beans require better grading and cleaning if they are to meet export standards. (It should be remembered that the soybeans tested by Ace Canning were not specially graded or washed.) A representative sample of soybeans as they are given by the farmers was sent for testing. Given that no pre-treatment was done, basically, the test result is very positive. The negative findings can be easily overcome. Taste is also not a problem. It can be easily solved by washing prior to use in soybean products.</p> <p>It is required to execute additional test to analyze vitamin and mineral content for further quality guarantee.</p>
Lessons Learned	<p><u>The protein content of local soybeans at nearly 50% is a very favorable finding for soybean processors.</u></p> <p>The Timor-Leste soybean dry matter protein content was found to be 49.13%. As a comparison, protein content of the beans used in Japan is typically less than 40%; and Ace Canning company targets 41-44%. This finding bodes well for future promotion of local soybean products.</p> <p>The other findings were that soybeans are not currently being effectively graded for size uniformity and not currently being properly cleaned.</p>

Feedback	<p><u>Local soybean product producers and traders can use tested information such as protein content and requirement further cleaning for promotion of their business.</u></p> <p>The local soy product producers should use the high protein content of their beans for market promotion. For example, labels on the soymilk should clearly mention the nearly 50% protein level. The tofu and tempe producers can also use this information to boost sales.</p> <p>In the domestic market sale of ungraded and/or poorly graded soybeans is common. Most small scale producers do not need accurate bean uniformity. If uniformity is required, buyers undertake additional grading directly themselves in the contract farming. However, in the future, if export is envisaged, a proper soybean grading and sorting system needs to be put in place. The major unfavorable findings were: (i) the adherence of soil/dust to the beans; and (ii) the resultant “not clean” taste. Unlike the effect of sorting, the marketing of unclean beans has a negative impact on both the domestic and potential export markets. Soybean product producers are easily able to overcome any “not clean” taste by undertaking extra cleaning steps. In the future, it is recommended that farmers be trained in improved methods for cleaning their produced soybeans.</p>
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3-5-8 Capacity Development Plan of Agribusiness Stakeholders

Verification	<p>This project is to provide learning opportunity for agribusiness stakeholders such as administration staff, institutes, private sector and farmers’/ women’s groups, in order that they can build agribusiness promotion capacity.</p> <p>In this pilot project, as a part of contract farming, cropping technology such as making methods of organic fertilizer and organic pesticide, and its spraying methods, was trained to farmers groups. This training was considered to be the technology transfer to district extension workers. Study team encouraged them to participate in the training. However, no district extension workers except Viqueque participated.</p> <p>It is crucial point for soy milk production to procure soybean as raw materials. To do so, it is required to make soybean production in quantity and quality ensure. To get this situation, extension workers should improve their cropping technology and knowledge. Promotion of organic farming is the main development policy of government. Extension workers are placed in the frontline for its promotion. They are responsible for technology transfer of organic farming. Extension workers has just allocated to each district. No concrete transfer actions are taken yet. It is the crucial subject for agribusiness promotion to ensure crop production. Capacity development for extension workers is the urgent matter.</p> <p>On the other hand, OHM (NGO) who acted as the technical supporting group in this pilot project, has learned know-how of organic farming method and organic soil making. The OHM is doing to transfer the learned technology to farmers groups.</p> <p>Considering the working process so far, it is judged that provision of the training opportunity was effective for future extension activity.</p>
Lessons learned	<p><u>It is an urgent matter for district extension workers to improve their cropping technology and promotion capacity. On the other hand, it can be possible to make use of NGO who learned know-how in the pilot project for promotion of the cropping technology.</u></p> <p>Key factor for sustainability of contract farming is whether production of organic soybean becomes stable in target level or not. To ensure sustainability, it is important that extension workers provide cropping technology for farmers groups. But, they did not participate in the training. For future soybean project, training opportunity should be provided for them.</p>

	<p>OHM (NGO) participated in this project has learned the necessary technology and knowledge. For future promotion of contract farming, trained OHM can support extension workers.</p>
Feedback	<p><u>MAF should provide training program for extension farmers to promote organic farming. On the other hand, NGOs and related private organizations/ groups who learned technology and knowledge can be incorporated as technical supporting group into the implementation organization of the Action Plan, to support extension workers.</u></p> <p>MAF should urgently provide train program for extension workers. However, it will take longer time until they obtain necessary knowledge and technology/ skill. Then, MAF should incorporate NGOs and private groups/ organizations who have experiences into the implementation organization as a technical supporting group.</p>

CHAPTER 4 PROMOTION OF SMALL SCALE BUSINESS OF POULTRY RAISING BY WOMEN'S GROUP

4-1 IMPLEMENTATION PLAN

4-1-1 Objective

This pilot project aims to support small scale poultry business running by local women groups in order to increase supply of domestic chicken meat and egg from farm household level to local market, and verify effectiveness of domestic poultry business as the substitute for importing chicken meat and egg.

4-1-2 Verification Theme

- The feasibility of domestic chicken meat and egg promotion so as to become import substitution products.
- The possibility of corn and other local products to utilize them as feed for chickens.
- The effectiveness of providing market information supply service of domestic and imported chicken meat and egg.
- The process of supporting poultry breeding business running by woman groups.

4-1-3 Action Plan

Under the project, training on chicken breeding, marketing, and group management is conducted. The concrete activity includes in training for improving henhouse, planning disease prevention measures. Promotion activity to sell domestic chicken and egg in the local market includes know-how of providing market information and making use of it. Those activities are practiced as an integrated activity since they are related with each others.

Action-1: Finding problems/ subjects in rearing chicken

Problems/ subjects in current rearing activities are found through discussion and actual rearing site observation. Necessary measures to cope with those are planned to introduce. If advanced groups who are versed in those problems/ subjects/ measures exist in the country, study tours to them are schemed to learn their technologies.

Action-2: Planning and practice of disease prevention

Action includes in the planning for henhouse improvement from viewpoints of good hygiene and disease prevention, vaccination service, disinfecting against parasite, developing proper immunity to chicken such as medication of lactic acid bacterium and use of traditional medical herb. It is based on the local adapted technologies so that women groups can provide by making use of local available resources and DNPV in district and central levels can provide technical services.

Action-3: Training for capacity building for business operation

Training is planned for women groups. Training fields include the overall operation and management of poultry business such as discussion process of making consensus among members, recording group activities and accounts, introduction of cooperative rules.

Action-4: Improvement of feed

Making feed is improved by using the locally available corn and other resources. The improved feed is practiced by related groups. The progress is monitored and assessed for feed improvement.

Action-5: Providing market information service and making use of it

The feasibility on supplying market information service of chicken and egg is studied for promotion of poultry business. Database of the market information is prepared in collaboration with DNPIAC and related district staff. Related women groups practice to make use of it for their business operation.

Action-6: Supporting new market development

Market development of chicken and egg is supported. Supporting activity is to prepare sales channel, collect market information and find new markets.

4-1-4 Action Group and Implementation Organization

Implementing body	:	DNPIAC
Technical assistance	:	Alora (Alola Foundation, NGO); chicken rearing, disease prevention, feed preparation, marketing of chicken and egg, business operation, etc. District DNPV staff; disease prevention, vaccination
Monitoring	:	Alora, District agricultural office, DNPIAC
Related organization	:	DNPV, DNAH
Target group	:	Women groups in rural area; Viqueque (Viqueque), Aileu (Aileuvila), Ainaro (Maubisse), Manufahi (Same); Total 53 persons, Lauten (Cacafen) ; 15 persons

4-2 PDM, ACTIVITY PROCESS AND MONITORING**4-2-1 PDM**

PDM for this project is shown in Table 4-2-3.

4-2-2 Activity Process

Problems arisen in the activity process and solutions/ measures taken/ under taking/ planning are summarized as follows.

Activity	Working Progress	Problem	Measure
Improvement of chicken raising technique	Training of chicken raising technology at each site - Clarification of problems and solutions through holding workshop - Holding seminars on chicken disease prevention with the collaboration of district DNPV workers - Training for women's group members on management and mandated activities - Conduction of study tour to learn the raising situations each others	- There are differences in frequency on mutual help and contribution among members depending on the group, which influence growth of chickens. - There are differences in frequency on acceptance of new technology, which influence occurrence of infectious diseases - It is necessary to level up technical and scientific capacity of district DNPV workers	In general, Timorese have very unique conscious to raise animals and poultry. Since most of people tend to avoid restriction of animals, only 1 group out of 4 accepted and implemented enclosed raising system. For chickens of this group, any disease did not appear, so that the enclosed raising would be effective method on prevention of ineffectual diseases. The district DNPV workers are requested to possess knowledge of disease prevention/control including vaccination and appropriate technology on animal husbandry/ poultry. They should be qualified persons with education background.
	Design and construction of henhouse using local	Henhouse should be designed with local	The henhouses should be improved to separate rooms by growth months of chicks

	materials, which are contributed by the group members.	materials available at each site to reduce construction costs. Using method of the incubator is not suitable at some sites.	to avoid fighting. The group of Maubisse begin to expand the henhouse for chicks. The incubators have not been accepted by all groups. They prefer natural warning by hens to incubator. In Maubisse, the group has expanded for chicks.
	Implementation of disease prevention	The chickens were suddenly dead after injection of vaccine at one site. Since women groups do not prefer public veterinary services, it is necessary to explore disease prevention methods by themselves.	Two methods of disease prevention had been conducted, which are acceptable by local people: <ul style="list-style-type: none"> ▪ Immution system will be strengthened by use of traditional medical plants. ▪ Using commercially-available micro-organism on Dili market, it will applied to chicken-raising for making fermentaed feeds, dosing in drinking water and spraying on and its surrounding of henhouses. Furthermore, in order to avoid virus and bacteria to infect diseases from excreta, the floor is compulsoly cleaned and the checkens should be contact with wild birds.
	Improvement of quality of feeds	The feeds will be prepared using locally-availbe materials udner the difficult situations of high prices due to poor harvest of major crops in 2010-2011.	The prices of maize show drastic changes at 0.90 US\$/kg in 6. 2011 from 0.45 US\$/kg in 10. 2010 in Same, Maubisse and Aileu markets. Therefore, the Study Team and NGO identified the loccally-available materials such as cassava flour, milled rice and dried copra. Ironically, imported rice is comperatively cheaper than local rice and other local crops. After feeding made by these crops and 1-2% of carbonic calcium powder, hens begun to produce eggs. White maize in limited volume were provided by group members, who feeded in grain not in powder even for chicks. Therefore, it is necessary to introduce the manually-operated corn mill, which can be operated in isolated areas in electric power supply. The Study Team and NGO had improved the corn mill and the corn sheller manufactured by the project of Baucau blacksmith supported by ILO.
Promotion of makrtin gnd sales	The limited numbers of chickens had sold for procurement of feed materials. Demands research in local towns had been conducted.	It takes time to produce eggs for sales. The group members should have abilities and information soucers to analyze market and farmers of maize.	In the next step, integrated measures should be taken coresponding to increase chickens and production of eggs. The measures include expansion of hen/chick houses, imporve of feed with balanced nutrition and distribution of chikens to members. To inquire market prices of chickens and eggs, information of NGO networks and DNPIAC are useful.

Note: For improvement of feeds, cassava was planned to introduce as a cost-effective crop. The seedlings of cassava would be used the variety of Ai-luka 2 developed by Seed of Life Project. The plant rhizome are chopped, dried and milled, and the plant leaves are fermented to remove poisoning cyanogenic glycoside. As well, they are mixed and fermented with other materials such as maize, bean, rice rince water, copra, papaya, banana, palm sugar, carbonited calcium and the solution of Effective Micro-organisms in order to increase organic acids and vitamins.

Table 4-2-1 Traditional Medical Plants for Chickens

Local Name (general name)	Botanical Name	Using Parts	Symptom
Ai-dila (papaya)	Carica papaya	Shoot leaf	Cough, sneezing, bowed head
Ai-fehur (chanchin australia)	Toona ciliata	Bark	Black comb, head swelling
Ai-lia (ginger)	Zingiber officinale rocs	Root	Rheumatic and paralysis
Ai-dik (erystrina)	Erythrina	Bark	Rheumatic
Ortalaun (mint)	Mentha cardifolia	Leaf	Respiratory, sneezing
Ai-manas lotuk (chilli spp.)	Capsicum frutescens L	Leaf	Diarrhea
Kafé (coffee)	Coffea arabica	Bean powder	Low immunity system
Tohu mean, Tehu (sugarcane)	Saccharum	Stalk	Low immunity system
Ai-nenuk (noni tree)	Morinda sp.	Bark, Fruit	Low immunity system
Nuu, Noera (coconut)	Cocos nucifera	Juice	Low minerals
Masin Midar, Seaber (chilli spp.)	Saccharum	Leaf	Low immunity system
Kinur (turmeric)	Curcuma domestica	Bark	Low immunity system

		
<p>Kick off workshop was opened in each site to discuss problem and solution. Major discussion was the way how to rear in the henhouse instead of the traditional natural raising. Problems arisen in the discussion are the lack of knowledge on compound feeds, attack from wild animal and disease prevention methods. Besides, mental matters such as human relationship within the group to keep sustainability of the activities.</p>	<p>Learning opportunity was held to share the knowledge about chicken disease prevention such as New Castle Disease (NCD) and other medical care by inviting district livestock workers. In the raising process, however, wrong medical treatment was executed in a site. This indicates there is the lack of medical knowledge on disease prevention in the district livestock workers. To ensure the sustainability, relationship of mutual trust, district livestock workers are required to improve their knowledge and prevention measures of diseases.</p>	<p>For construction of henhouse, groups provided available local materials. These were the bamboo in Aileu, concrete block in Maubisse, bamboo in Same and leaf of palm tree in Viqueque. Structure of tin roof and concrete bed was built. In Viqueque, bigger house was constructed at 8.2 m long and 3.2 m wide because of much local materials provided by group members.</p>

		
<p>Livestock is currently raised with the natural free style. 24 hours enclosing in henhouse is practiced only in Maubisse. But, in other three sites, enclosing is limited only in the night time to protect from animal's attacks. The reason is that there are vegetable cropping plots around henhouse. Solar panel and incubator for hen was installed in the henhouse. But, it was not used fully.</p>	<p>As for making local made compound feed, the market prices of local maize has jumped up because of crop failure due to heavy rainfall in nationwide. It is required to provide alternative source of feeds. Ai-luka2 (<i>Manihot esculenta Crantz</i>) improved in the Indonesia, is selected. This variety has high yield capacity at 26 ton/ ha).</p>	<p>In order to prevent from New Castle Disease and other infect diseases, it is required to avoid connection with wild birds and treat excretion. It is also required to strengthen immunity system against these diseases. To do so, there is a way that compound feed which would be fermented by lactic acid bacteria and yeasts is applied. The workshop was hold to train the way how to make fermented materials.</p>
		
<p>The cage type raising method was introduced to Don Bosco Agricultural Technical College at Fuiloro, Lospalos, Lautem District funded by Cathoric network. They imported egg producing variety of 5,000 chicks, <i>Red cornish spp.</i>, from Malaysia in August, 2010. However, they lost 3000 hens, and it was diagnosed infectious laryngotracheitis due to symptom. The some infectional disease attacked chickens at the project site at Viqueque, and the group lost 90% of chickens.</p>	<p>The manually-operated grinding machines are introduced from Baucau blacksmith project and improved by the Study Team and NGO. The bearing of main shaft was replaced to roll bearing of rear axle of sedan car. Then, it becomes possible to turn easily by single hand force of women. The performance is improved from 50-80g/min by manual stone crashing to 300-300g/min by the machine.</p>	<p>In Timor, some traditional medical treatments has been handed down for prevention of diseases. For example, the group in Same utilizes papaya leaf, sugarcane and coconuts juice showing in the photoes. All groups use papaya leaf extract, which contains papain, digestive enzyme, and polyphenol to promote cytokine. They assist immution system and elder farmers know it experientially. These tradition methods are compiled in broucher and provided to the target groups. Please refer to the next table.</p>

Table 4-2-2 Present Situation in Each Site (1ST Year/ 2nd Year)

Site	Aileu	Maubisse	Same	Viqueque
Group name (Number of women)	Orbufet (8)	Matak Malirin (10)	Hakfen (20)	Girasol (15)
Social and natural conditions				
Elevation (m)	950m	1,500m	400m	50m
Climate zone	North hill	North mountain	South hill	South low plain
Language	Mambae	Mambae	Mambae	Makassae
Site access and infrastructures	Along main road Water supply and power supply limited only night time	Along main road Spring No power supply	1.0 km away from the main road No water supply and power supply	Within the town Water supply provided. Power limited night time
Raising progress				
Raising style	Natural in day time Henhouse in night time	Henhouse in both day time and night time	Natural in day time Henhouse in night time	Natural in day time Henhouse in night time
Chicken at the beginning	0/0	0/34	6/29	25/101
Chicken	22/11	34/40	62/10	140/31
Egg produce	41/7	0/8	102/10	225/11
Chick produce	18/8	0/5	40/10	105/15
Chick dead	18/0	0/22	10/0	25/5
Chicken dead	22/1	0/0	0/21	25/95
Sold out chicken	0/0	0/0	5/4	30/1
Sold out eggs	0/0	0/0	30/0	120/0
Accumulated sales amount	0/0	0/0	US\$41/US\$32	US\$234/US\$25
Raising progress	<ul style="list-style-type: none"> - Chicken-raising started in June, 2010 and being well progressed. Vaccination was conducted in October, 2010 by district DNPV worker. In the next day, all chicken were dead. It seems to miss treatment with incorrect medicine. - Despite such incident, the group restarted in December, 2010 considering the market price of maize and tendency of disease occurrence. - In 2nd year, the group used traditional medical plant and fermented feeds, and any disease was not occurred. 	<ul style="list-style-type: none"> - Raining is started in July, 2010. Closed mutual reliability among members results well-being progressing. - Chicken is rearing in the henhouse for full time to prevent chicken from vegetables around the henhouse. - It was initially introduced to make home-made compound fermented feeds, and any disease was not occurred. - Some chicks were dead by very low temperature, not by disease. - The henhouse was expanded to separate by monthly age to avoid mutual conflict.. - Compost fermented by chicken dunk and multiplied 	<ul style="list-style-type: none"> - Chickens are well growing by traditional raising method before rain season. - By the reason of shortage of feed materials such as maize, many chickens were dead due to malnutrition. - Marketing price of maize was jumped up in 2011. Then, it is required to find other feed materials in low costs. - Since the group members prefer to apply traditional disease prevention method, they will increase production of papaya and sugarcane. 	<ul style="list-style-type: none"> - The group has two year advanced experience of raising chicken before this project started. Then, raising chicken is well progressed. The group sells produced chicken and eggs. - It is the major constraint that henhouse is located in the dense living area. The raising space is too small to take natural free style. On the other hand, selling condition of produced one is convenient because it is located close to living area. - The group has intension to open the chicken food restaurant. - It is important to seek any possibility to seek market channel of produced

Site	Aileu	Maubisse	Same	Viqueque
		micro-organisms at the site makes control of armyworm on cabbages, which appeared until the last season. - Sales of chickens will be started in June, 2011.		chicken and eggs. It will be required to seek suitable feed crops and procure feed crops through out-sourcing.
At the newly-joined group in Cacaven, Lospalos, Lautem District, the members try to construct henhouse in order to reduce inputs from outside as much as possible. They agreed to start activities from May, 2011 to avoid risks of inflectional diseases. Though the seminars on compound feeds making and traditional medical plants, the member proposed many ideas to discuss expecting problems and solutions solved by members.				

4-3 Final Evaluation

4-3-1 Implementation Organization

The action groups are 4 women's groups located in 4 districts and different natural conditions and 1 FFS (Farmers' Field School). The supporting groups are involved the two groups; district livestock office under DNPV to manage chicken disease prevention; NGO (Alola Foundation) to facilitate overall operation and management of raising activities by the action groups. The study team guided direction of the project, and provided detail technical guidance the groups through NGO.

Raising works had been progressed in 1st Year, although there are some differences related to the growing number of chickens at four sites. Growing number of chickens was increasing except Aileu. In the Aileu, all of the raising chicken has been dead. According to the investing result, it was pointed out that incorrect medicine was injected. It means that veterinary services should be carried out by qualified and trained persons who have enough capacity and knowledge regarding chicken disease diagnosis, medical treatment and vaccination so as to take suitable medical measures in the raising sites. It is the key factor to establish good relationship of mutual reliability between district workers and action groups in order to make chicken raising work smooth. Learning opportunities should be provided for them with launching poultry business project in nationwide.

As for overall operation, the NGO assigned as a supporting group in this project has much accumulated experiences and knowledge/ skills in supporting various activities of women's groups in this country. For further development of women's capacity, the NGO is requested to identify and collaborate with advanced cases and experts on poultry, and to provide learning opportunities.

Since some action groups did not follow technical instruction, most of chickens had been dead due to inflectional diseases after completion of 1st year project period. Therefore, they have been seriously implemented disease prevention in technical approaches such as fermented feeds making and traditional medical treatment. MAF DNPV workers on ground are requested to learn and develop appropriate and acceptable poultry techniques including disease prevention, because general rural population do not prefer to vaccination. It is also important to implement nationwide bio-security such as bird flu and New Castle Disease.

Table 4-2-3 PDM for Promotion of Small Scale Business of Poultry Production by Women's Group

Project Name: Promotion of Small Scale Business of Poultry Raising by Women's Groups

Duration: 1.5 years from February, 2010 Ver.2

Target Groups: Women's groups in Aileu, Ainaro, Manufahi and Viqueque as well Farmers Field School in Lautem

Date: 10 June, 2011

Narrative Summary		Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal		The sales amounts of women's groups are reached at 332US\$ (7. 2010 - 6. 2011).	Interviews to the groups and records	The conditions of egg/chicken market are not changed significantly. However, the prices of live chickens are increased at 160% in 4-6 2011 due to shortage of supply.
Project Purpose		The numbers of accumulated raising chicken are reached at 350 chickens in the project (6.2011).	Interviews to the groups and records	
Output		1) The member learned raising techniques of feed nutrition/fermented feed and disease prevention using micro-organisms and traditional medical plants. 2) Only the group in Maubisse accepted enclosed raising method in henhouse. 3) The members of all groups provide services and feed materials. However, some members still lack consciousness on sanitation in henhouse. 4) The groups in Same and Viqueque become easier to contact with local traders, because local demands are higher than local supply.	1) Numbers of small seminars and training (4 times for each group) 2) Interviews to the groups 3) Status of henhouses and interviews to the groups 4) Interviews to the leaders of groups	Natural disaster does not affect their activities seriously. However, low temperature in Maubisse damages on chick growth in 5.2011. Infection diseases do not break out in the country wide. However, <i>Gallid herpesvirus</i> causes <i>infectious laryngotracheitis</i> in eastern districts including Viqueque.
Activity		Input		
1) Training of chicken raising 1-1) Improvement of disease prevention 1-2) Improvement of feeds 2) Introduction of improved henhouses 2-1) Design for disease and foreign threat prevention 2-2) Building the improved henhouses 3) Training of women's groups operation 4) Training of marketing 4-1) Collection of the marketing information 4-2) Development of the sales destinations		Study Team Side Personnel	Local Side MAF Personnel	The attendants of the training do not leave women's group. District livestock workers do not take disease control measures and vaccination services. Preconditions Agribusiness policies of MAF are not changed significantly.
		Technical expert 1 person Local supervisor 4 persons JICA study team members (Advisor on chicken raising) 1 person	MAF Livestock extension workers MAF Agribusiness officer for monitoring and promotion in the events	

4-3-2 Final Evaluation

Items	Final evaluation
Validity (Score: 4)	<p>Chicken meat and egg are high quality protein foods, but most of them are imported. Since 2010, commercial production of chicken eggs has started at the rate of 5,400 pieces per day in Railako, Elmera District, which volume is insufficient for Dili consumers. There is no data to show exact imported amount. According to the FAO source data, recent imported chicken meat is counted at 4,500 ton annually. As for import amount of chicken egg, there is no data. Most of them sold in the market are the imported one. It is important to encourage women groups to produce foods such as chicken meat and egg in the rural area as substitute foods for imported. Poultry production for local consumers in rural areas should be encouraged in the viewpoints of national food security.</p> <p>The Government emphasizes promotion of small scale livestock in the rural areas to improve nutrition intakes for rural people. There are experiential gaps among five groups. However all of group members have intention of chicken-raising, and some groups are very active under the leadership among groups and are going to expand. Commercial production alleviates demand pressure, but the poultry company imports all feeds from Surabaya, Indonesia, which would have limitation of production in one place.</p> <p>Under such conditions, it is obvious that small scale chicken-raising activity such as this pilot project contributes to the local market of chicken and eggs. Considering these, it is judged that validity of the project is high. Since local chickens produce limited numbers of eggs, MAF is requested to introduce high yield variety of chickens such as Leghorn or hybrid varieties in the future. But, this pilot project aims to produce and sell local eggs in the limited small market area. It is also judged validity is high.</p>
Effectiveness (Score: 3)	<p>There are differences in numbers of produced chickens by site. Two groups of Viqueque and Same have already raised chickens before this pilot project launched. As the results, the number of their chicken produces is increased. Then, they sold out living chickens and eggs. Supplies of these products to local markets are overwhelmingly insufficient against local demands, which structure leads to high pricing in the curtain period. Those sales prices are US\$10.00 – 15.00 per chicken and US\$ 0.20 – 0.25 per egg. Increase of chickens can be directly incomes for group members, but full-scale sales activity is not taken except Viqueque. Effectiveness of this project does not be verified yet.</p> <p>Since it is obvious to get profits from this activity even purchasing feeds, all groups are eager to extend their activities. To cope with price fluctuation of feed materials is the key factor to obtain profitability.</p> <p>In spite of rare experience in chicken-raising for the groups of Aileu and Maubisse, the number of chickens has being increased progressively. However, chickens have been dead due to incorrect medical treatment. This incident shows that capacity and knowledge about disease prevention of district workers remain at low technical level. Under this circumstance, NGO instruct to strengthen immunity system of chickens using fermented feeds and traditional medical plants. It is proved that these approaches are effective on disease prevention for local population. It is requested to provide opportunities to learn appropriate technology for district officers and workers of DNPV and DNPIAC.</p>

Items	Final evaluation
	<p>MAF has been implementing small scale chicken-raising activity in Lautem and Manufahi based on concept of FFS (Farmers Filed School), which is funded by EU and facilitated by NGO (Child Fund). If mutual learning between those and the pilot project's groups would be provided for them, it would be useful to make effectiveness high.</p>
<p>Efficiency (Score: 2)</p>	<p>Major technical issues can be summarized on disease prevention, preparation of quality compound feeds and low cost henhouse construction. Beside technical challenges, human factors are also important; consciousness of involvement and commitment of group members, building of reliability among members, observance of agreed actions and contribution from husbands of members.</p> <p>Regarding raising methods, henhouse enclosing type was recommended, only Maubisse group was accepted. Other groups release chickens during daytime and keep them in henhouse in nighttime. This method is generally accepted and familiar to Timorese due to spiritual consideration about animals. The advantages of enclosing method are to avoid damages of cropping vegetables like the organic farm of Maubisse group and to suppress infectious transfer of virus from wild birds.</p> <p>Regarding procured equipment, the chick incubator with solar power generation set would be one of necessary inputs because of low temperature in highlands. However, it is observed that the group members do not prefer to use complicated system. Effective way to protect chicks from low temperature would be improvement of nests staying together with mother chicken.</p> <p>For extension of disease preventing measures, it is probably economically-efficient to use traditional medical plants and fermented feeds and to control Salmonella, Escherichia coli and virus in chicken dunk by micro-organisms. In order to create bio-security network in nationwide, it takes time and efforts for training.</p> <p>The sales activity in full-scale had not been carried out except Viqueque group. It is expected that increase of raising numbers, since most of group members understand importance of nutrient balance in compound feeds; specially calcium for egg production. Contribution and wisdom in arrangement of feeds will help to success their chicken business.</p> <p>The result of the calculation of B/C ratio is spread from 0.22 of Aileu until 1.3 of Viqueque as the effect of death from an illness. The total B/C of Maubisse, Same and Viqueque is 0.82, which excludes Aileu because the productivity was remarkably low in comparison with other sites. Aileu had a problem of the group management in addition to the death from an illness.</p>
<p>Impact (Score: 3)</p>	<p>According to the lessons learnt and experiences form NGO (Alola Foundation), women groups desire to raise chicken and grow crops in kitchen garden. Rural women also hope to make handicrafts. There are requests from them in doing it. It might be difficult to continue the activity since its market scale is too small. It is likely for rural women to deal in raising chicken and selling produced. The activity may bring large impact to them in generating income source.</p> <p>This pilot project is implementing in the four sites where natural conditions are different; Aileu: the basin of EL. 950m, Maubisse: the high land EL 1,500m, Same: slope land EL 400m and much rainfall, Viqueque: low land EL 50m and much rainfall, Lautem: slop land EL. 200m. The five sites are regarded to be the representative area of each natural condition, and access from main roads is easy. Five sites have the function</p>

Items	Final evaluation
	<p>of pilot in different natural conditions and demonstration effect.</p> <p>Besides the above impact, judging from the effects and activities achieved so far, it can be said that solidarity of the groups and mutual relationship of group members may bring positive impact on the project.</p> <p>Chicken meat is one of important source of protein. Small scale and dispersed poultry business might contribute food security in Timor. It is possible to sell middlemen or local markets if raise 100 hens/group or more, which impacts on macro economy.</p>
Sustainability (Score: 3)	<p>In order to ensure the sustainability of the project, establishment of chicken disease prevention system is the most important subject. It is indispensable to support from district livestock department in taking prevention measures.</p> <p>There is a shortage of relationship of mutual trust between raiser and district livestock medical staff. It is necessary to improve their capability on disease prevention, in order to establish the system. NGO should lead group activities as a facilitator for the sites where cooperative relationship for disease prevention can not be built between raiser and district staff. NGO should make arrangement with district medical staff timely as required. NGO should be also trained so as to learn basic knowledge and technology on chicken disease and traditional prevention measures.</p> <p>To promote sustainability after completion of the pilot project, it is useful that NGO leads to distribute chicken and teach raising technology to the other groups. In addition, pilot project sites may serve as learning center or on-going FFS (Farmers Field School). Raising activity would be promoted through mutual learning in such sites.</p> <p>Each site should tackle the following subjects to ensure the sustainability.</p> <ol style="list-style-type: none"> 1. Aileu: Feed supply (contribution from and cooperation among group members), implementation of disease prevention 2. Maubisse (Ainaro): Feed supply (cropping of yellow maize), expansion of henhouses, countermeasure on low ambient temperature, implementation of disease prevention 3. Same (Manufahi): Feed supply (cropping of new variety of cassava), implementation of disease prevention 4. Viqueque: Feed supply (cropping of yellow maize), implementation of disease prevention, value-adding by operation of restaurant, expansion to raising places to members 5. Lospalos (Lautem): Feed supply with procurement of seeds and seedling, implementation of disease prevention
Total Score: 15	

Subjects arisen in the implementation process summarized into the following development elements of raising and taking disease prevention measures.

Elements	Subjects
Raising technique	<ul style="list-style-type: none"> - Construction of confidence among group members and strengthening of management capacity - Construction and expansion of henhouses in low costs and separation of chicks - Distribution of hybrid variety of egg producing chicks by DNPV in district offices - Extension of appropriate poultry rising technique by DNPV, DNPIAC and NGOs
Feeding	<ul style="list-style-type: none"> - Procurement of compound feed materials in low costs and production of feed crops by group members

	- Quality upgrading of fermented feeds including nutrient balance of carbohydrate, protein, fats, vitamins & minerals (calcium), fermentation technic and multiplication of micro-organisms
Disease prevention	- Training and expertizing on diagnose diseases, quality control of vaccine and biosecurity for DNPV officers and workers - Strengthening of immunity system of chickens in ground level instead of vaccination

4-4 EVALUATION OF THE VERIFICATION THEME

(1) The Feasibility of Domestic Chicken Meat and Egg Promotion so as to Become Import Substitution Products

The pilot project was so launched that local women groups aim to operate both growing chicken and egg collection as chicken raising business. Through the project implementation process, it was verified that they dealt positively in the growing chicken business, on the other hand, they did not engage in the chicken egg collection business. The reason for this is considered that; severe and costly works so as to prepare well compounded feed and maintain in-chicken house raising is required to handle commercial based egg collection business; However, the pilot project could not infiltrate the sense of egg purpose raising style into the women groups who are familiar with free livestock raising style traditionally. In addition to this, women groups are aware of disease occurrence risk. Recent year, large scale egg purpose chicken raising business was launched by private investor. There is imported chicken egg at cheap price on the market. Under such conditions, commercial based economic feasibility of women groups' handling chicken egg business is considered to be low. But, egg sales might be led by them in the small local market area, not in large scale business. Considering future chicken raising development by women groups, it seems that development possibility of commercial based egg collection business covering wide market area is low.

Chicken growing activity is going smoothly. But, the business scale is limited to the small market area. As in the pilot project, the activity always is faced with lack of feed and disease occurrence risk. It was resultant that their activity did not reach to the certain level of commercial based business. Local chicken has a constant demand in the market, since local people prefer domestic chicken meat to the imported one. In the limited market area, it is possible to substitute for imported meat.

(2) The Possibility of Corn and Other Local Products to Utilize Them as Feed for Chickens

There was crop failure in last year because of flooding and soil erosion caused by long term much rainfall. Production of maize was also dropped. As the result, the pilot project faced with difficulty in collecting maize for chicken feed. It was urgently required to prepare compound feed in place of maize.

Large scale chicken raising business is operating to import all of the feed. For the pilot project operating by local women groups, feed materials should be procured easily and by cheap price. As the study results of local resource available in the surrounding area, it was planned to make compound feed with broken rice, dried and milled cassava, dried copra and vegetable. The compound feed was prepared, tested and fed to the chicken. Besides the feed problem, infectious disease has occurred in the wide area including the pilot projects. Therefore, it was also required to find and apply any effective measures so that chicken can have immunity. Finding study is conducted. As the study, it was planned to use medical plants whose effect is succeeded traditionally in local area and fermented feed with microorganism.

After preparation, those were applied on the chicken. Chicken is growing smoothly. It seems that crops such as cassava, broken rice and medical plants are available as compound feed is effective.

(3) The Effectiveness of Providing Market Information Supply Service of Domestic and Imported Chicken Meat and Egg

Women groups sell grown chicken and collected egg at the required time through local middleman. In the sales activity of them, market information brought from women groups' own communication route and middleman is utilized. Price negotiation is conducted based on those collected market information. If the sales marketing area would be limited in so small as the women groups, provision requirement of market information service covering with wider markets is low.

(4) The Process of Supporting Poultry Breeding Business Running by Woman Groups

Pilot project trained the women groups for improvement of their raising technology such as in-chicken house raising and using incubator for low temperature time, besides the feed preparation and disease prevention as mentioned above. However, trained technology was not always fixed to the women groups who are familiar with traditional free raising style. Therefore, it is required to support them by repeating the training until chicken raising technology is put on them. From the pilot project, technical subjects to be tackled for future chicken raising are compiled to the improvement of raising technology, preparation of compound feed and disease prevention measures. Participated NGO in the pilot project tackled these subjects, and obtained experience and knowledge related with these subjects. Considering future supporting to women groups, it is effective to make use of such NGO.

4-5 LESSONS LEARNED AND FEEDBACK TO THE ACTION PLAN

Effectiveness of the Draft Action Plans was verified based on the implementation process and outputs of this pilot project. Lessons are also learned from the pilot projects and obtained the lessons are supposed to incorporate into the finalization of each project of the Draft Action Plans. Obtained lessons, experiences and verification results are complied as follows.

4-5-1 Support for Set-up of Processing Industries by Farmers/Women's Groups

Verification	<p>This project is to support farmers' groups/ women's groups in setting up/ operating and managing agribusiness activities using locally produced agricultural materials. Supporting activity is largely dependent on the specific target crops and products/commodities as well as the project "Support for Set-up of Private Processing Industries".</p> <p>The effectiveness is verified through chicken business activity.</p> <p>The pilot project is to support chicken raising activity for marketing chicken meat and eggs by women's groups in local area. This project was started in the four districts. One group site in Lauten district was added in the later stage. Effectiveness of this project activity was verified through overall evaluation of the activity process including provision of chicken house, training on raising chicken (preparation of feed, supply of feed, provision for disease prevention, etc), following activity in the sites and support in selling produced chicken and egg. Outcomes of the activity can be seen in the change of the figures of raising and selling chicken and laying egg. However, there was occurrence of uncontrolled risks. These were the occurrence that raising chicken dead with outbreak of infection and wrong treatment by district livestock department. The pilot project implementation was affected by such occurrences. Considering these</p>
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situations, it might be too hasty to evaluate the effectiveness of the supporting activity. In spite of such negative influence, women groups are continuing raising activity, chicken and laying eggs increased in number, compared with in the beginning stages. It is judged from the performance so far that supporting activity was considered to be highly effective. Target of the pilot project was put on the commercial based chicken raising by women groups. However, it is judged that the commercial sense as targeted in the beginning stage was not infiltrated into the women groups. Several factors affected to generate commercial sense. These may be put on this verification.

Self-sufficient farmers in Timor-Leste have the sense so that purpose of livestock raising is primary put on home-consumption, food security as required occasion and income source in an emergency. Consequently, women groups have not sense that chicken raising activities always is not commercial purpose. As for chicken egg business, there is a keen competition with imported cheap eggs in the market. (Private investor is doing large scale chicken egg business in this country.) In addition, as the constraint, shortage of corn as chicken feed and risk of unexpected disease may background not to generate commercial sense among members of the women groups. They could not prepare enough chicken feed because of corn crop failure in last year. And, they faced with the risk of disease occurrence. Egg purpose chicken raising requires severe management skill for longer term than in the growing chicken. Under such background, raising sense of the women groups was put on the raising for meat market rather than the egg market.

Death of the raising chicken in the two women groups pushed into the sense of shift to chicken meat purpose raising. All of the raising chicken was dead in the Aileu district since district livestock department staff took the wrong treatment against disease. In addition, an infectious disease broken out in Viqueque and Lautem districts. In the Viqueque's chicken raising group, due to the infection disease, 95 of the total 101 chickens were dead. (Similar disease damage has caused in Lautem. about the 3,000 number, 60 % of the total raising chicken was dead in the large scale chicken egg purpose business by private investor.) The risk of disease always exists in this country. To prevent such disease occurrence as possible, the project has trained women groups to raise in-house chicken raising so as to avoid any contact with wild bird and animal. However, 24 hours in-house raising as trained was followed only in the Maubisse. In other sites, in-house raising method was applied for night-time. Although incubator was provided against cool temperature in the night time, especially in high land, it was not used effectively as trained. Significance of such training was not completely put on women groups. They did not fully understand the significance and effectiveness. Women groups who are accustomed to the free raising of their animals, could not understand the severe raising method. It is considered that it was hard for women groups to create commercial chicken raising sense required severe management.

After the chicken dead, it was concerned that chicken should gain immunity from disease. To do so, it was tried to improve feed compound and introduce traditional disease prevention measure through finding and using available medical herb and other effective local materials. At present, chicken raising in the sites is going smoothly. As for the disease prevention measure, it was designed in the beginning stage that district DNPV should treat all of the infection. However, women groups observed that wrong treatment was taken by the district DNPV. There is no relationship between the women groups and district DNPV about disease prevention measure. DNPV staff is required to learn about disease and its treatment method and build their capacity. It is to strengthen chicken raising activity in the local area. Under such conditions, as for near

	<p>future chicken raising, it is required to support such local adopted raising and feed preparation using local material available in each site. In the pilot project, feed was compounded by mixing with broken rice, corn, grained dry cassava, which is tried to supply. Following corn, market price of cassava is rising. Women groups are trying to collect available feed together with members.</p>
Lessons learned	<p><u>Chicken raising activity may be accessible for women's groups in local area. since they can set up with low capital investment. It is hard to expand the raising activity because of unexpected disease occurrence risk. Considering such risk, it is realistic for women groups to put chicken growing business rather than chicken egg business, through strengthening traditional raising method by using local feed materials.</u></p> <p>Chicken raising is the possible business which highly-motivated women groups can start easily in the local area. However, there is difficulty in preparing feed and risk of disease occurrence. Considering such conditions, it may be realistic business to grow chicken and sell them rather than collect egg and sell it. Women groups aim to grow chicken having immunity from disease and sell grown one to the market. To realize such business, women groups are required to train for full time in-house raising, prepare feed so that chicken can gain immunity from disease. They should be also trained to take effective measure against cool temperature, learn basic knowledge and treatment of disease prevention. Those training should be repeated until fixing on the women groups. Observing the activities performed so far, it is judged that women groups can build their capacity, although their learning is progressive. Women groups can improve their business capacity through repeating experience based learning in each site.</p> <p>District DNPV staff is requested to take proper disease prevention measure to women groups at required time. DNPV is responsible for vaccination, education on disease and treatment for its prevention. However, from observing the wrong treatment in Aileu, it can be judged that district DNPV staff always cannot apply proper measure. It seems that they have not necessary knowledge and skill on chicken disease. Under such situations, it is important to avoid damage causing disease occurrence as possible. For near future, therefore, it is realistic to aim to grow chicken and sell grown to the market, rather than egg purpose chicken raising.</p> <p>The present operation and management capacity of women's groups is too weak enough to make chicken raising businesses sustainable. It is required to provide technical and mental supports so that they can keep motivation until they master their raising skill and get certain profit. It is effective to provide learning opportunity, for example, study tour between chicken raising farmer groups. They can learn each other through mutual learning.</p>
Feedback	<p><u>Chicken raising is incorporated into the Draft Action Plan as a realistic agribusiness activity in rural areas. Chicken raising business is put stress on the growing local chicken rather than the chicken egg purpose raising. It can be led by strengthening traditional raising way.</u></p> <p>Lessons learned and experiences from the pilot projects such as feed preparation using local materials including cassava, making use of fermented feed to gain immunity are put in the Draft Action Plan for near future chicken raising activity. Existing guideline modified based on the lessons learnt form this pilot project is useful. It is also proposed to make use of the pilot project sites as the demonstration sites for future chicken raising activity.</p>

4-5-2 Support for Provision of Processing Infrastructures

Verification	<p>This project is to support farmers' groups/women's groups in providing processing infrastructures such as power supply and water supply, as needed to operate installed machinery or equipment. This project is carried out based on the local conditions. (This is the temporary project until government provides power supply service and/or water supply system in the target areas.)</p> <p>This project was undertaken in this pilot project. In the pilot project, refrigerators to keep vaccine and incubators were provided for some of the four sites. This provision is to prevent chicken diseases from spreading. The solar panels were procured as their power source by the Study Team where power supply service is limited only at night time. Installation of the solar panels was decided upon after careful consideration of the ease of operation and maintenance including future burden of O/M expenses by women's groups. The capacity of the solar panels was designed based on the necessary power requirements. The installed solar panel systems are utilized as planned. (Solar panel system was effective, but, incubator itself was not fully utilized.) Effectiveness was verified through the installation process. But, that of Aileu was moved to other site. (It was moved against robbery.) It is important to monitor whether provided infrastructures are being utilized as planned or not.</p>
Lessons learned	<p><u>The power source of the processing machinery and equipment was designed based on operation and maintenance method including bearing the running cost.</u></p> <p>In the rural areas in Timor-Leste, electric power supply is limited to only for a short time at night. Under such power supply limitations, it is unrealistic to provide large scale processing machinery and equipment required large power supply facility. Machinery and equipment should be small scale without large scale power supply requirements. In cases where there is a limited power supply, use of solar panel is popular in rural area since it is easy to procure and manage. It was provided from the viewpoint of operation and maintenance. It is necessary to monitor its utilization regularly for installed machinery and equipment.</p>
Feedback	<p><u>Power source of the processing machinery and equipment should be planned based on the local conditions and operation/ management capacity of targeted processor/ women's groups/ farmers groups. Providing that they could not purchase power supply equipment, government should establish financial supporting system such as subsidy system and a long term loan system for them.</u></p> <p>When this project is planned, it is important to understand the progress of the nationwide electric power supply plan and its service areas including whether this project's target area is covered or not. And, the power source should be planned based on the local conditions. Diesel engine generator demands fuel regularly. Its introduction should be decided by judging from the ease to obtain fuel in the local specific conditions at the project target site and their bearing capacity.</p> <p>There are some cases where processors/farmers' group/women's group do not have enough fund to purchase and operate the processing infrastructure. Providing such case, it should be incorporated into Draft Action Plan to provide financial supporting system. Government should provide these kinds of a subsidy system and long term loan system, as well as the case of processing machinery or equipment.</p>

4-5-3 Provision of Agribusiness Information and Communication System

Verification	<p>This project is to provide market information of agricultural products so that agribusiness stakeholders such as private processors, farmers groups/ women groups, middlemen, traders, retailers and administrators can get at required time and operate their agribusiness. It is designed that DNPIAC collects necessary market information of agricultural crops and products from the district market, compiles them as database and send to the stakeholders. There is no effective agribusiness information and communication system so that agribusiness stakeholder can make use for their business.</p> <p>Effectiveness of this project was verified through the collection process of market information about chicken and egg. Women groups collect market information of chicken and egg and sell them through middleman. Market price of domestic chicken and egg is higher than the imported ones. In case of chicken egg, domestic one is 25 cent per one piece, while 25 cent for imported. It is said that local people prefer quality of domestic eggs imported. In the neighboring sites of Dili, a private chicken raiser started large scale chicken egg business. It is anticipated to be keen competition for chicken egg in the local market. There is also risk of disease occurrence and difficulty in feed preparation. It seems to be difficult for local women groups to promote commercial chicken egg business in local area. As for chicken, women groups are doing business through middleman as required time. In general, middle and chicken raisers collect market information based on their own way.</p>
Lessons Learned	In case of small scale sales chicken business by women groups, it is easy to send to the market through middleman. Necessity of data base preparation covering market information widely.
Feedback	Small scale chicken raising women groups collect local market information through middleman and/or related persons for their sales activity. Market information is communicated by simple method like SMS.

4-5-4 Support for Marketing Route Development

Verification	<p>This project is to support sales promotion of local agricultural crops and product. In the Draft Action Plan, MAF should develop comprehensive sales promotion strategy such as agribusiness fairs, use of market booths (antennae shop), promotion campaign like 'Local product-Local consumption' by means of radio and newspaper.</p> <p>Pilot project was attacked by lack of chicken feed and unexpected disease. These situations caused women groups not to create commercial sense of chicken and egg business. In the original implementation plan, it was planned to support that chicken and egg produced by women groups were sold directly to the local restaurant and retailers by developing market channel. However, women groups could not reach to that sales situation. Although sales activities were conducted through middleman, Sales activity by means of developing new market route could not practiced.</p>
Lessons Learned	Even in the rural area, imported chicken meat and eggs are sold at cheaper price than the local produce one. Consumers prefer domestic ones to the imported one. It is said that the taste quality is better than the imported. Therefore, there is a constant demand in rural area. Chicken raising activity is limited to the small scale avoiding risk of the disease. Besides the sales through local middleman, it can be realistic to develop other market route like local restaurant.
Feedback	It is required for women groups to run commercial chicken raising activity avoiding the risk of disease and lack of feed. But, it is hard to take fully necessary measures against the risk. Under the current constraints, chicken raising is limited to the small scale in household level aiming

	to generate non-farm income source.
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4-5-5 Capacity Development Plan of Agribusiness Stakeholders

Verification	<p>This project is to provide learning opportunity for agribusiness stakeholders such as administration staff, institutes, private sector and farmers'/ women's groups, in order that they can build agribusiness promotion capacity.</p> <p>District DNPV in Aileu has conducted wrong treatment against the disease. In Viqueque, many of the raising chicken have died by a kind of infection. To promote commercial based chicken raising, suitable disease prevention measures should be taken timely. As the pilot project case, it is judged that district DNPV has not enough knowledge and technology against disease, It is heart the same cases. There is the district where the relationship between chicken raiser and district for disease prevention can not be built.</p> <p>NGO who participated in the pilot project has obtained useful technologies which are to prepare feed by using local materials and gain immunity against the disease occurrence. The NGO prepared a booklet printed those technology. It can not be expected to gain disease prevention support from government organization. Under such difficult situation, it is effective to incorporate the NGO who has knowledge and experience for disease prevention into the chicken raising activity.</p>
Lessons learned	<p><u>It is urgently required for district DNPV staff to improve their knowledge and technology to disease prevention.</u></p> <p>District DNPV has not enough capacity to take disease prevention measure, because of lack of knowledge and treatment method.</p>
Feedback	<p><u>DNPV should provide for district staff training opportunity to learn disease prevention measure. For promotion of chicken raising in household level, it can be effective to make use of NGO who has technology and experience.</u></p> <p>DNPV provides district DNPV training opportunity so that they can learn knowledge and technology to the chicken disease and medical treatment, vaccination and medication. This training is to allow them to take suitable prevention measures in a timely manner.</p>

CHAPTER 5 DIVERSIFICATION OF CORN PRODUCT

5-1 IMPLEMENTATION PLAN

5-1-1 Objective

This pilot project aims to promote diversification of domestic corn. To do so, the project is designed to introduce domestic corn flour as a substitute for imported wheat flour to the bakeries/ processing groups, and manufacture any corn flour products such as bread and chips, expand its manufacturing method and support to sell them.

5-1-2 Verification Theme

- Potential of domestic corn flour as a substitute product for import wheat flour.
- Possibility of increased domestic corn consumption of corn flour based products
- Using process of market information service for promotion of domestic and imported corn.

5-1-3 Action Plan

The activity is planned to develop and introduce new breads made from corn flour to the bakeries in Dili. Possibility of future sales promotion is sound by conducting market research and tasting test of the new breads. Based on the sounding survey, it is planned to introduce preferred ones to local bakeries to promote corn products in local markets.

Action-1; Developing new domestic corn products and introducing to Dili market

New products using domestic corn flour are developed by a bakery in Dili. Sales promotion is sought through tasting them and its feasibility is analyzed.

1-1 Developing new products using domestic corn

Market information of domestic corn is collected from Dili and major local markets so as to procure good quality corn enough to make flour. Proper flour millers are found around the markets. After milling, corn products made from corn flour such as bread are developed by a bakery or food processors in Dili.

1-2 Monitoring profitability through market research and tasting of the new products

Making processes of the new products are improved through tasting them and analyzing its profitability. The tasting survey is executed to seek its sales possibility. The project also supports to seek new markets such as school lunch program.

Action-2; Introducing developed products to local markets and supporting its sales promotion

The activities aim to introduce the new products developed in Dili into local markets and support its market expansion.

2-1 Introduction of the new products into local food processors/ bakeries

The method for making the new products which was provided based on the tasting results and profitability analysis in Dili market is introduced to local food processors/ bakeries. After procurement of corn and milling it, the introduced method is applied by them.

2-2 Supporting sales promotion of the new products through studying its marketability in local market

Profitability of the products is analyzed through observing sales situation in local market. Based on the analysis, necessary measures such as improvement of the method to make and

sell it, may be practiced to provide the marketability.

5-1-4 Action Group and Implementation Organization

Implementing body	: DNPIAC
Technical assistance	: CDEP (Centro do Desenvolvimento da Economia Popular; NGO); food processing, marketing of corn, milling, support of manufacturing/ sales promotion.
Monitoring	: District Agricultural office (Baucau, Manufahi), DNPIAC
Related organization	: DNAH
Target group	: Bakeries who are interested in corn bread in Dili, Same and Baucau

5-2 PDM, ACTIVITY PROCESS AND MONITORING

5-2-1 PDM

PDM for this project is shown in Table 5-2-2.

5-2-2 Activity Process

Activity	Working Progress	Problem	Measure
Trail Milling Corn Flour	Ready made corn flour is not available anywhere in the country. The pilot used corn milled with machines located in Maliana to serve Dili; and milling machines were provided by the pilot to bakeries in Baucau and Same. All produced good quality corn flour with no significant technical problems. Trials were completed in Maliana for yellow (Sele) and white (Arjuna) corn. White corn was selected as more appropriate due its being softer and its superior acceptance during Focus Panel taste trials.	Sufficient corn for milling is not available at a financially viable price in either Dili, Baucau or Same. It is only available in consistent quantities at a reasonable price in Maliana. Corn flour at a reasonable cost could not be either: (i) trans- ported from Maliana to either Baucau or Same; or (ii) produced in Baucau or Same.	The pilot used a corn milling operation with 4 machines located in Maliana; and transported corn flour to Dili. In Same and Baucau small corn mills were provided to the bakeries. Financially viable transport was only possible from Maliana to Dili.
Trial Baking Corn Bread	Trial corn bread baking was successfully conducted in Dili and later extended to Same and Baucau. Technically no production problems were encountered.	Corn bread baking competed for time, space and labor with regular wheat bread production.	A special production schedule was made with bakeries so as to minimize interference with regular commercial operations.
Focus Panel Corn Bread Testing	A 13 member Focus Panel completed tests for 3 corn-wheat flour mixtures, 3 levels of sweetness and 2 types of corn. A corn bread recipe was finalized based on Focus Panel results.	The correct proportion of corn to wheat flour had to be sufficient both to: (i) maintain a basic wheat taste but; (ii) still replace for the maximum amount of wheat flour. Proposed Focus Panel	A ratio of 1 part corn flour to 2 parts wheat flour was determined to be optimum with a taste acceptable by all. JICA Study Team added

Activity	Working Progress	Problem	Measure
		participants were largely from Government and donors.	Focus Panel panelists from bakeries, restaurants and households.
Trial Baking Corn Products	The pilot trialed 17 different non bread corn products (i.e., cakes, pastries, etc.).	All the recipes provided flavorful and potentially sales worthy products. However, it was difficult to determine which product would be commercially successful as demand depends on local conditions and orders.	It was decided to cover all 17 corn product recipes even though it required a 15 day training period.
Extension of Corn Bread & Corn Products to Dili Bakeries	Corn bread recipes were successfully extended to 4 Dili bakeries; and corn products to 1 Dili bakery/caterer.	<p><u>Flour:</u> Corn flour was not available in Dili.</p> <p><u>Bread:</u> All of the bakeries were able to easily bake the corn bread. However, introduction of corn bread interfered with the flow of their established wheat bread operations.</p> <p><u>Products:</u> The teaching of so many corn product recipes was time consuming. To cover all 17 recipes, it required a 15 day training period. Only 1 of 4 bakeries had sufficient time, skills and interest to learn about corn products.</p>	<p><u>Flour:</u> The pilot arranged for shipment of corn flour from Maliana.</p> <p><u>Bread:</u> The pilot worked with all the bakeries to integrate corn bread making with their existing wheat bread production operations.</p> <p><u>Products:</u> Extension effort for corn products was shifted to focus on the 1 Dili bakery with significant interest in corn product production.</p>
Extension of Corn Bread & Corn Products to District Bakeries.	Corn bread and corn products recipes were successfully extended both to 1 Baucau and 1 Same bakery.	<p><u>Flour:</u> Since difficult to obtain corn flour, bakeries needed to produce their own corn flour.</p> <p><u>Bread:</u> All of the bakeries were able to easily bake corn bread.</p> <p><u>Products:</u> Baucau and Same bakeries had sufficient time, skills and interest to learn all 17 recipes.</p>	<p><u>Flour:</u> The JICA Study Team provided and trained the Baucau and Same bakeries with 1 corn milling machine each.</p> <p><u>Bread:</u> No major problems encountered</p> <p><u>Products:</u> No major problems encountered.</p>
Sales Promotion of Corn Bread & Corn Products in Dili	The pilot developed a sophisticated corn bread introduction program, which included 57 trials and distribution of over 7,000 pieces of corn bread to over 20 different institutions covering 100's of	<u>Flour:</u> Corn flour was not available in Dili.	<u>Flour:</u> Milled corn flour from Maliana, was transported to Dili and sold at the financially viable price of \$0.60/kg. This provided an additional source of sales and income to both growers and millers.

Activity	Working Progress	Problem	Measure
	<p>consumers.</p> <p>Bread: Only 1 of the 4 bakeries is continuing commercial production of corn bread.</p> <p>Products: The 1 bakery trained in corn products is continuing to produce to these products in its catering business. Also the women trained under the pilot “Local Products – Local Consumption” are selling corn products.</p>	<p>Bread: The corn bread introduction trials found significant consumer demand at sufficiently high prices. In addition, corn bread is a financially viable product. It sells at the same price as wheat bread (i.e., \$0.10/piece) and yet costs 13% less to produce (See Table 5-2-1).</p> <p>However, 3 of 4 bakeries still preferred to concentrate on their core businesses and return to only wheat bread production. The reasons cited for ceasing operations included: (i) lack of demand compared to wheat bread; (ii) high delivery costs; and (iii) too much management effort needed for market development.</p> <p>Products: The business orientation, operational procedures and equipment of bread producers are different from those needed for corn product production. Product production is better suited to a catering service or a cake bakery rather than a commercial bread bakery.</p>	<p>Bread: The pilot tailored a more effective marketing approach for the remaining Dili bakery, Delta. Delta is now successfully delivering house to house, in the early morning. Delta’s corn bread is sized to be slightly larger than the comparable wheat bread. Sales of corn bread in May 2011 were 16% of total sales (i.e., 250 paõ/day at \$0.10/loaf); and sales are continuing to grow. Project attention has now concentrated on boosting Delta sales through promotion of wider geographic coverage and reaching new outlets such as restaurants.</p> <p>Products: Extension effort for products was shifted to the 1 bakery interested in providing catering services for corn products; and the women train in the pilot “Local Products – Local Consumption”. These producers are operating very successfully.</p>
Sales Promotion of Corn Bread & Corn Products in Districts	The Baucau and Same bakeries have temporarily halted both corn bread and corn product operations.	<p>Bread/Products: Corn price in both Baucau and Same has surged since 2009 when the average price was \$.045/kg in both districts. As of April 2011, corn flour costs were \$1.39/kg in Baucau and \$0.93/kg in Same. This is three times more than it was in 2009 in Baucau; and more than twice its former price in Same. It is also over 50% higher than the April 2011 Maliana price.</p> <p>At these high prices, corn bread/product production in both Baucau and Same is not a commercially viable</p>	<p>Bread/Products: The Project suggests adding 1 small scale bread producer and 1 product producer in Maliana, where the corn flour price in April 2011 was only \$.60/kg - significantly below that of either Baucau or Same. This was not done at pilot inception since corn price at that time was nearly the same in Maliana, Same and Baucau (\$.45/kg); and the DNPIAC recommended Same and Baucau as pilot sites. Maliana was already highly represented in donor projects.</p>

Activity	Working Progress	Problem	Measure
		venture.	

Table 5-2-1 Corn Versus Wheat Bread Production Cost Comparison

No.	Ingredients (a)	Quantity (grams)	Price (\$/kg)	Ingredient Cost (\$)
1.	Wheat Bread			
A.	Wheat Flour	1,000	1.00	1.00
	Total	1,000		1.00
2.	Corn Bread			
A.	Wheat Flour	667	1.00	0.67
B.	Corn Flour	333	0.60	0.20
	Total	1,000		0.87
3.	Savings From Corn Flour Use			
A.	Saving/kg (\$)			0.13
B.	Savings Percentage			13 %
C.	Profit Increase/Bakery/Year (\$ (b))			140

Notes: (a) Other ingredients such as salt, yeast, sugar, energy and labor are the same.

(b) Assumes: 62.5 g/paõ, 225 paõ sold/day, 300 working days/year, saving \$0.13/kg.

		
<p>Training Same bakery owner in the operation of a small Pilot supplied corn mill.</p>	<p>Corn bread for sale by a participating bakery at UN World Food Day national exhibition.</p>	<p>Small scale production of corn bread at the Madera Bakery in Same.</p>
		
<p>Delta Bakery loading bread into delivery boys' baskets.</p>	<p>Early morning door to door hot bread delivery by a Delta Bakery worker</p>	<p>Making corn pastries sale in kiosks located at the Same marketplace.</p>

Table 5-2-2 PDM for Diversification of Corn Products

Project Name: Diversification of Corn Products

Target Group: Bakeries in Dili, Same and Baucau

Duration: 1.5 years from February 2010

Ver. 10

Date: 21 April 2011

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal</p> <p>To accelerate business development, increase employment and substitute for imports through use of domestically produced corn flour as a partial substitute for imported wheat flour in the manufacture of bread/pastries.</p>	<p>Pilot supported bakeries to increase sales, employment opportunities and import substitution by replacing imported wheat flour with domestically produced corn flour in bread/pastries at Pilot completion.</p>	<p>NGO and JICA Study Team monitoring of participating bakeries' sales income, production volume, inputs and number of staff.</p>	<p>The availability and prices of domestically produced corn flour versus imported wheat flour do not change significantly.</p>
<p>Project Purpose</p> <p>To increase sales income, provide additional jobs and reduce dependence on imported wheat flour through substitution of domestically produced corn flour for wheat flour in bread/pastries.</p> <p>1) Corn milling to produce appropriate flour for bread/pastry making. 2) Corn bread (i.e., bread partially made from corn flour) is developed by NGO. 3) Corn bread trials conducted by NGO with Focus Panel 4) Corn products other than bread (e.g., cakes, pastries, etc.) are developed by NGO 5) Extension of corn bread recipes and techniques to participating bakeries. 6) Extension of corn products recipes and techniques to participating bakeries. 7) Corn bread is sold as a regular commodity by the participating bakeries. 8) Corn products sold as regular commodities by the participating bakeries.</p>	<p>The Pilot supported bakeries to add income, sales volume and jobs from production of newly introduced corn flour bread/pastries at Pilot completion.</p> <p>1) Corn flour is produced, which is appropriate for bread/pastries 2) Corn bread making is undertaken by NGO 3) Corn bread trials completed with Focus Panel results. 4) More than five types of corn products are trialed. 5) Corn bread recipes/techniques extended to participating bakeries. 6) Corn products recipes/techniques extended to project bakeries. 7) Corn bread sales are 10% of total income of participating bakeries. 8) Corn products are 10 % of non bread income of Pilot bakeries.</p>	<p>NGO and JICA Study Team monitoring of participating bakeries' sales income, production volume, inputs and number of staff.</p> <p>1) JICA/MAF/NGO sampling of corn bread made from corn flour by NGO 2) JICA/MAF sampling of corn bread made Focus Panel results. 3) NGO progress reports of corn bread 4) NGO reports and field verification by JICA Study Team 5) NGO reports and field verification by JICA Study Team. 6) NGO reports and field verification by JICA Study Team. 7) NGO/JICA Study Team interviews with participating bakeries. 8) NGO/JICA Study Team interviews with participating bakeries.</p>	
<p>Activities</p> <p>1) Development of corn bread 1-1) Trial milling of corn flour from several corn varieties 1-2) Trial of baking of various corn breads 1-3) Focus Panel sampling and selection of corn bread recipe 2) Trial making of corn products other than bread by NGO with Dili bakery 3) Extension of bread and corn products recipes and techniques 3-1) Extension of corn bread/corn products recipes to Dili bakeries 3-2) Extension of corn bread/corn products recipes to local bakeries 4) Sales Promotion of corn bread and corn products 4-1) Sales promotion of corn bread and corn products in Dili 4-2) Sales promotion of corn bread and corn products in local areas</p>	<p>JICA Study Team Side Personnel</p> <p>1) CDEP Project Management NGO 2) JICA Agribusiness Study Team</p> <p>Provision of Machinery and Equipment</p> <p>1) Corn milling machine 2) Manual corn grinder 3) Food materials</p>	<p>Timor-Leste Side Personnel</p> <p>1) Bakers in Dili, Baucau and Same 2) MAF staff in Dili 3) MAF staff in Baucau and Manufahi</p> <p>Building and Facilities</p> <p>1) Bakeries 2) Bakery ovens 3) Bakery equipment</p>	<p>Bakeries continue operations with trained staff; and new items are consistent with existing operations, procedures and equipment.</p> <p>Preconditions</p> <p>MAF's agribusiness policies are not changed significantly.</p>

5-3 FINAL EVALUATION

5-3-1 Implementation organization in the activity process

Stakeholders for this project are the supporting groups of the Ministry of Agriculture and Fisheries (MAF) and the NGO Centro do Desenvolvimento da Economia Popular as well as the implementation groups of bakeries in Dili, Same and Baucau.

(1) Ministry of Agriculture and Fisheries

MAF, Agribusiness Department has taken an active role in concept development. It directly assisted the pilot by: (i) recruiting participating bakeries in Dili, Same and Baucau; (ii) recruiting Focus Panel participants from restaurants, donors, and bakeries; (iii) serving on Focus Panel boards; and (iv) promoting products to other government agencies and at national exhibitions. MAF, District officials have assisted the JICA Study Team in the field by locating appropriate bakeries; and introducing the JICA Study Team to the selected bakeries. MAF has demonstrated its interest in the pilot; and is well positioned to continue its implementation.

(2) Centro do Desenvolvimento da Economia Popular

Centro do Desenvolvimento da Economia Popular (CDEP) is a Dili based independent non-profit NGO. Its mission is to assist rural communities to produce and market local produce. CDEP is active in the planning, implementation, marketing and monitoring of agriculture projects. CDEP assisted with all phases of the implementation of the pilot. CDEP frequently provided useful input to both the JICA Study Team and the bakeries. Their services and reporting have exceeded expectations; and are performed on time in professional formats and in good English. Its' staff have taken a very proactive approach; and have proven to be very good, hands-on problem solvers. Based on JICA Study Team and bakery assessments, their performance is rated as very good. It is recommended that CDEP be considered as an executing agency for similar future projects.

(3) Bakeries

A. Dili

Padaria Samsan

Padaria Samsan is one of the largest bakeries in East Timor. It has been in operation since 1985. It is owned and managed by Mr. Federico da Silva Sam. The bakery employs 12 staff; and sells about 8,000 pieces of bread per day to a range of customers including kiosks, shops, government institutions and restaurants. The bread is produced during the night using 2 traditional wood fired ovens. It is made from 100% imported ingredients. Although the management capability is very good, workers dedicated and the production facility appropriate, from the Pilot's perspective the bakery had several limitations. These included: (i) lack of long term commitment to the pilot's intent; (ii) failure to devote sufficient attention to solving market problems; and (iii) lack of creative approaches to marketing. As an established, successful, rather large firm, Padaria Samsan is better suited to marketing its established products rather than new product development. Due to these constraints, the JICA Study Team shifted Dili bread production to an alternate bakery small bakery, Pasquela Bakery; and another large Dili commercial bakery, Li Kin Tai.

Li Kin Tai Bakery

Li Kin Tai Bakery is a large and well known Dili bread producer located near the Taibesi market. It

has been in operation since 1985. It is owned and managed by Mr. Lim Neng Jung. The bakery employs 20 staff; and sells about 16,000 pieces of bread per day. About 20% of sales are to kiosks and 80% to the general public. The number of buyers is on the increase as more people are buying bread since it is faster and easier to prepare than rice. The bread is produced at night using 3 traditional wood fired ovens. It is made from 100% imported ingredients. The management capability is very good and the production facility appropriate. However, from the Pilot's perspective the bakery had several limitations. These included: (i) lack of long term commitment to the pilot's intent; (ii) failure of the staff to follow management directives to devote attention to the new product; and (iii) lack of a marketing effort. As with a Padaria Samsan, the Li Kin Tai Bakery is content to focus on its established products. It had limited interest in new product development. Due to these constraints, after an approximately 3 month trial period, the JICA Study Team removed Li Kin Tai from the pilot.

Pasquela Bakery

Isabel da Sousa Pasquela Bakery (Pasquela) is a family run, home-based operation. It is managed by Ms. Pasquela, who is assisted by her 2 sisters. Its production facility is very simple, essentially consisting of a single kitchen room equipped with a kerosene cooker and stove top oven. Usually the bakery runs a catering service taking orders and then supplying baked goods to customers. The staff are very cooperative, skilled and motivated. They have shown themselves ready, willing and able to work with the Pilot. Unfortunately, the Pasquela Bakery is limited by its small scale of operations. Also the bakery is more interested in production of corn products as compared to bread. Consequently, it has chosen not to further produce paõ; but rather to focus on its catering business of selling corn products in response to orders. It is very successful in its catering business; and also often appears at national exhibitions (e.g., Independence Day Celebration – 19 May 2011).

Delta Bakery

The Delta 3 Has Laran Bakery (Delta) is a medium size bakery. It has been in operation since 2008. It is owned and managed by Mr. Guilermo de Arujo. Mr. Arujo used the services of a local consultant to design and build the bakery and train the workers. The bakery employs 4 staff (2 women; 2 men), all of whom are family members. The bread is produced during the night using 1 traditional wood fired oven. Deliveries are made from 05:00 to 08:30 from wicker baskets carried by 3 high school students. The bakery sells about 1,500 pieces of bread per day to the neighboring community.

The pilot selected Delta as the focal point of its attention. Delta meets the Pilot's revised selection criteria of: (i) long term interest in the product; (ii) medium size scope of operations; (iii) flexibility and (iv) appropriate skills. Consequently, Delta was assisted to procure 20 kg of Maliana produced corn flour/week. Corn bread sales began in early March 2011 with production of 50 pieces/day. In the beginning, both corn and wheat bread were offered and note taken of which customers preferred corn bread. Delta now provides corn bread to those who prefer it. Corn bread sales rose to 125 pieces/day in April and 250 pieces/day in May 2011. Sales are still continuing to grow. Delta believes that the key to success is to: (i) sell hot corn bread; (ii) make the corn bread slightly bigger than the wheat bread; and (iii) deliver door to door early in the morning directly to the customers.

B. Other Same and Baucau Districts

Same: Mr. Domingus Madera is the bakery's owner/operator. He and his wife have been running their bakery by themselves since 1999. The facility uses a traditional wood fired oven. The bakery produces 400 – 500 pieces of bread per day. They mix the dough in the early evening, form the dough into bread

at midnight, cook bread at 05:00 and complete cooking at 06:00. After that, 20% of production is distributed to neighbors and the rest brought to kiosks located in the Same central market. Bread ingredients are all imported.

Prior to the pilot, Mr. Madera had never tried cooking bread or making other products with corn flour. However, he has shown himself to be a very quick learner and receptive to new ideas. The project provided Mr. Madera with a small corn mill. He was able to easily understand the training in corn milling and corn bread/products making.

Unfortunately over the period of the pilot, corn kernel prices nearly doubled from about \$0.45/kg to \$0.83/kg. This large escalation in prices completely changed the profile of both the corn bread and corn product businesses making both not financially viable. Consequently, the bakery has stopped production of both corn bread and corn products. Should prices decline, Mr. Madera would be a good candidate for future cooperation.

Baucau: Isabel Da Sousa Freitas runs a small home-based bakery, which has been in operation since 2002. It began participating with the pilot in late October 2010. It is a single proprietorship with no formal corporate documentation. Ms. Frietas operates the bakery with her elder brother's 2 sons. She makes 2 types of bread: small rolls (paõ) and square bread loafs. Work begins at 5 AM and ends at 8 AM (1 hour each for preparation, baking, selling). Her most serious production problem is finding sufficient firewood. She spends an average of 1.25 hour per day just collecting firewood. She could buy firewood in the Baucau market for \$1.00 per bundle; but she considers this option prohibitively expensive. Production is about 532 pieces of bread per day with production almost every day including weekends. All ingredients are imported from Indonesia; but, readily available in Baucau. Prior to the pilot project, she had never tried making corn bread but was pleased to join the pilot project. Ms. Frietas received training in October 2010. After the training, a small corn flour mill was provided by the pilot.

As with Mr. Madera, over the period of the pilot project, corn kernel prices increased drastically. Baucau suffered an even greater price increase than Same with corn prices shooting up almost three fold from \$0.45/kg to \$1.25/kg. As in Same, this large escalation in prices rendered the production of both corn bread and corn product businesses not financially viable. She too has stopped production of both corn bread and corn products. Like Mr. Madera in Same, should prices decline, Ms. Frietas would be a good candidate for future cooperation.

(4) Millers

Millers stand to gain sales as more flour is demanded from increased corn flour utilization. The pilot supported bakery, Delta, purchases corn flour from a mill located in Maliana. At present, Delta purchases only a modest amount of corn flour. (+/- 100 kg/month). However, as sales of corn paõ grow so too will sales of corn flour. There are an estimated 50 small scale bakeries in Timor-Leste. If most of those located near Dili and Maliana (+/- 20 bakeries) move to making corn paõ and follow the same production and sales profile as Delta, the demand for corn flour would rise by 20 mt/year. This increase in corn flour demand would significantly boost sales by Maliana corn millers. Farmers would benefit too. Since in country maize production is estimated 1.1 mt/ha, about 20 famers could be supported from the increase in corn demand.

There are small corn millers at most market places. Typically they are active only on market days. These small millers make rough cut corn powder, which is used in a traditional porridge known as

“sasoro”. Most corn millers use machines with screens, which can be changed to grind corn to any required fineness including flour. However, although physically capable of producing corn flour, these small corn millers were not easily used under the pilot because: (i) they usually only work on market days; (ii) sometimes corn is not available in the nearby market; (iii) input costs and the resultant corn flour prices are often prohibitively high (e.g., Dry corn kernels in Dili can cost \$1.00/kg or in Baucau \$1.25/kg, while at the same time are priced at \$0.44/kg in Maliana); (iv) millers are sometimes reluctant to change the grinding screens; and (v) millers accord priority to the higher paying “sasoro” customers. For these reasons, Dili bakers import corn flour from Maliana; and the Same and Baucau district bakeries were given their own small milling machines.

5-3-2 Final Evaluation

Items	Final evaluation
Validity (Score: 3)	The “Diversification of Corn Products” overall goal, project purpose and outputs remain consistent with the Government’s development policies of economic development, employment promotion and import substitution. The pilot introduces new products made from locally produced corn, thereby boosting sales incomes and creating additional job opportunities for farmers, millers, bakeries and caterers. It also has the purpose to shift food demand away from imports to locally produced crops; thus promoting import substitution and lowering foreign exchange costs. From the donor perspective, the pilot addresses cross cutting issues such as economic development, poverty alleviation, gender equity and employment generation. Considering these conditions, the Pilot’s intent remains valid.
Effectiveness (Score: 4)	To date, the pilot has been found effective for an individual bakery to meets its goals of boosting incomes, generating employment and substituting for imports. It also has the upstream impact of supporting both farmers’ and millers’ production. The small women-owned Pasquela Bakery continues very successfully with catering of corn products as do the women trained under the pilot “Local Products - Local Consumption”. The pilot trained three bakeries in the making of 17 recipes for corn products, which exceeded by 3 times the project target of 5 non corn bread products trialed. Also expectation is that the Pasquela Bakery can meet or surpass the project corn product sales target of 10% of total sales. For example, in May 2011, in addition to its normal corn confectionary sales, the bakery very successfully sold a range of corn products at the Independence Day Celebrations; while, the women trained under the pilot “Local Products - Local Consumption” are also very active selling corn confectionaries. This corn-bread is not promoted into large size bakery. The medium size Delta Bakery is making good progress marketing its corn paõ. In May 2011 it was selling 250 pieces of corn bread per day, which is equivalent to 16% of total sales. This exceeds by over 50% the project target of 10% of total sales. The key to Delta’s sales is its new approach of: (i) selling hot corn bread; (ii) making the corn bread slightly bigger than the wheat bread; and (iii) delivering door to door early in the morning directly to the customers. This approach has the potential to increase bakery sales, job opportunities and substitution of corn for wheat flour. Considering these situations, it is judged effectiveness is high.
Efficiency (Score: 3)	The quality and quantity of the inputs were acceptable. Machinery and equipment functioned well and raw material inputs such as corn flour quality were better than expected. Primarily due to a more than doubling of corn prices, the small bakeries’ corn milling machines were only partially used. All other inputs have been fully utilized. This

Items	Final evaluation
	<p>pilot project was implemented on schedule. The project cost including all services and materials is estimated at \$25,000. It appears reasonable when compared to the goods and services offered.</p> <p>On a macro scale the pilot also proved itself quite efficient. Assuming nationwide 20 bakeries follow Delta's production and sales example, wheat imports would be reduced by approximately 15 mt/year (equivalent to \$15,000/year), which compares well with the one time pilot cost of \$25,000. If the effect of the project continues 10 years and the average price of corn flour is assumed at \$0.8/kg, the B/C ratio becomes 1.2.</p>
<p>Impact (Score: 3)</p>	<p>The pilot's positive and intended impacts to increase sales income, provide additional jobs and reduce dependence on imported wheat flour had a positive but limited impact and are described in "Effectiveness" above.</p> <p>Unintended but modest positive impacts include: (i) increased sales from corn millers; (ii) improved corn market for farmers; and (iii) development of new corn products. These positive benefits are expected to increase as the production of corn paõ becomes more widespread. It is anticipated that other bakeries will follow the example of Delta. There are an estimated 50 small scale bakeries in Timor-Leste. If 20 follow Delta's example, the demand for corn flour would rise by 20 ton/year. This increased demand for corn flour would boost Maliana millers sales and income. Also since in country maize production is estimated 1.1 ton/ha, about 20 famers could be supported from the increase in corn demand.</p> <p>An unintended negative consequence is that some of the small corn mills given free by the Pilot compete are currently unutilized and have the potential to compete against existing corn millers.</p>
<p>Sustainability (Score: 3)</p>	<p>Delta corn bread and Pasquela catering operations appear to be economically viable commercial enterprises.</p> <p>The sustainability of catering operations selling corn confectionaries is highly likely. The products are well accepted; and, in fact, often preferred over comparable items. Profit margin depends on the specific product. However, in general, the markup for corn cakes and pastries is over 30%, making their sale a highly profitable business. Women trained under the pilot project "Local Products - Local Consumption" are already selling corn confectionaries for profit as a part of their catering services.</p> <p>Corn paõ production also appears to be a sustainable business. The taste of wheat bread is typically preferred by consumers. Nevertheless, the pilot project has demonstrated that with proper market promotion corn bread can substitute for about 15% of wheat bread sales. Furthermore, it is analyzed that corn bread is more economical to produce than wheat bread as shown in Table 5-2-1. Corn bread costs 13% less to make than the comparable wheat bread product. This means that a small scale bakery with a total production of 1,500 paõ/day can sell 225 corn paõ/day. Assuming 300 working days per year, each bakery can therefore expect to increase profits by about \$140/year.</p> <p>Corn bread bakeries sustainability could be further enhanced through improvements in their production lines. The bakers are interested and motivated to upgrade their operations but lack both technical knowledge and capital. Simple improvements could be made through the addition of new equipment such as in flour mixers, compartments for hot storage of bread and delivery containers. Also there is ample opportunity to upgrade bakery design, especially for oven refinements and utilization of waste heat.</p>

Items	Final evaluation
Total Score: 16	

5-4 EVALUATION OF THE VERIFICATION THEME

(1) Potential of Domestic Corn Flour as a Substitute for Imported Wheat Flour

As anticipated through the pilot project, there is strong potential for import substitution of imported wheat flour by domestically produced corn flour. The basic preconditions for success exist. However, to be effective, current supply and demand conditions need to be carefully considered both for wheat and corn flour.

Since its introduction by the Portuguese over 200 years ago, wheat flour has been widely consumed throughout Timor-Leste. It is used for breads, cakes and biscuits. Timor-Leste does not produce wheat, so 100% of wheat flour must be imported. Total annual wheat flour imports are estimated at 15,000 ton (+/- US\$ 12 million). In May 2011 wheat flour was readily available throughout the country with an average sales price of \$1.00/kg.

In contrast, corn is the mostly commonly grown crop in Timor-Leste. It is cultivated by about 80% of rural families on a cultivated area of approximately 80,000 ha. However the production of corn flour faces three major constraints as follows.

Lack of Corn Supply: Corn yields in Timor-Leste are estimated at 1.2 ton/ha, which are only about one quarter of the Asian average. To make matters worse, in times of heavy rains such as 2010 and 2011, yields are reduced even further. In addition, post-harvest losses are reported to be high, often reaching 30% of production. The combination of all these factors means that despite widespread growing, production is quite limited. The result is that farm families seldom have excess supply and typically consume all their corn directly as food and livestock feed. Probably less than 20% of corn production ever reaches the marketplace. Oftentimes, in markets other than Dili, Baucau and Maliana, corn is just not available at all for purchase. Even then, the corn in Baucau and Dili is shipped in and not produced locally. Surplus supplies of corn are really only consistently available in Maliana.

Dearth of Corn Flour Millers: Corn is eaten either boiled or as porridge, "sasoro". The porridge is made from rough ground corn powder, which is mostly pounded by hand. For those near urban areas, there is the option to use small millers, who are located at most marketplaces. These millers work mostly on market days and almost exclusively make rough cut corn powder for porridge. Their machines have multiple screens, which could be changed to grind corn to any required fineness including flour. However, since there is, at present, almost no demand for corn flour they almost never make it.

High Transportation Costs: Surplus corn can be had in Maliana, where there are corn millers capable of making flour on an order basis. In May 2011, corn flour could be obtained in Maliana for \$0.55/kg. Shipment to Dili is relatively reliable and inexpensive at \$0.03/kg (i.e., \$1 for a 30 kg sack). This is not the case with other towns, which face prohibitively high transportation costs from Maliana.

At present corn flour is available for about half the price of wheat flour in both Maliana and Dili. Consequently, in both these locations corn flour could be an economically favorable replacement for

wheat flour. Sufficient milling capacity exists in Maliana and transportation links at reasonable cost connect to Dili. However, the amount of wheat flour substitution would depend on corn availability. Corn yields now only average 1.0 ton/ha but in nearby Indonesia often reach 6 ton/ha. So presumably corn yield could be increased dramatically to meet demand. Combined Dili and Maliana represent about 30% of the nation's population but about 50% of Timor-Leste's purchasing power. Estimated annual wheat flour consumption by both these places is about 7,500 ton. With a concerted promotion program, expectation is that 15% of wheat flour could be replaced by corn flour in these two cities. The resultant wheat flour import substitution would then be 1,125 ton per annum saving nearly \$1 million each year.

(2) Possibility of Increased Domestic Consumption of Corn Flour Based Products

There are two main types of domestically consumed corn flour products: (i) paõ and (ii) confectionaries. Each has a different market profile.

By far the most popular wheat flour product is the ubiquitous local breakfast rolls known as paõ. They are produced by about 50 bakeries nationwide and consumed daily by most Timorese. Paõ can now be considered as a basic traditional staple food. As such, many consumers have a decidedly fixed preference for wheat paõ. Consequently, changing consumption patterns away from this traditional staple product is challenging. Partial substitution for wheat paõ has been demonstrated under the Pilot to be quite possible but requires a long term, well conceived strategy.

This pilot project made considerable progress developing the technology for corn paõ. White corn is grown by 85% of Timorese farmers with the remainder yellow corn. Although modern hybrid corn types (e.g., Arjuna, Kalinga, etc.) are occasionally found, most corns grown are hard, flint type varieties. Under this project, a Taste Evaluation Panel tested both the white and yellow corn varieties. There appeared to be little difference in taste between hard and hybrid corn paõ. However, white, as compared to yellow corn, was preferred for both its taste and softer texture. Also the Taste Evaluation Panel found a mixture of 15% corn flour and 85% wheat flour resulted in the best tasting corn paõ. It was determined that on an average day about 15% of consumers were willing to purchase corn rather than wheat paõ.

Other than paõ, corn flour based products such as porridges, cakes and pastries are traditionally consumed. Unlike corn paõ, however, they do not compete directly with wheat flour products and are very popular. Under the pilot project, 17 recipes for corn products were successfully provided. In addition, the other pilot project 'cooking classes' featured many dessert recipes based on corn flour which proved very popular. No doubt excellent potential exists for the expanded sales of corn flour based confectionaries.

(3) Using Process of Market Information Services for Promotion of Domestic and Imported Corn

The price for imported corn can already be estimated based on communication with overseas suppliers and Internet searches. However, timely information on domestic corn prices is entirely lacking. In this pilot project, all of the market information were collected by participated private sectors own means.

Stakeholders such as farmers, traders, flour millers, bakers, caterers and retailers all have very limited access to market information on selling and buying prices and volumes. As a consequence, they are not able to make fully informed marketing decisions. In absence of information, the markets are not able to function efficiently.

DNPIAC already collects commodity market information. However, it does not have a means for electronic distribution of the information. If marketplace's market prices and volumes were communicated to private sector through the existing hand phone system using SMS's, decision making and planning would be greatly enhanced. Corn is the target crop for government purchasing system. If the system continued, significance of market information system is low.

5-5 LESSONS LEARNED AND FEEDBACK TO THE ACTION PLAN

Effectiveness of the Draft Action Plans was verified based on the implementation process and generated outputs. Lessons are also learned from the pilot projects, and obtained lessons are incorporated into the finalization of the Draft Action Plans. Consideration of lessons learned, verification results and feedback item to be put on the Action plan obtained were complied by Project of the Draft Action Plan, as follows.

5-5-1 Support for Set-up of Private Processing Industry

Verification	<p>This project aims to support private processing industry in setting up and operating their processing business through supporting value adding process of the agricultural products and new commodity development. Supporting activities by this project is largely dependent on targeted processing products/commodities.</p> <p>Target of this pilot project is to make market of corn produced widely in this country more active. Effectiveness was evaluated by verifying the supporting process in developing new commodity such as corn bread, cakes and cookies. (Out of them corn bread was mainly targeted since bread is generally consumed nationwide, so that development potential of the corn bread is considered to be high.) Bakeries were selected from those who have strong will to challenge new product development based on the related information supplied from DNPIAC.</p> <p>As the first step, corn bread was developed as new commodity by large scale bakery in Dili. This process was supported in procurement of corn, flouring of them by miller, trial corn bread and panel of them, and trial sales for consumer. Corn bread could be on sales at cheaper prices than the usual wheat corn. Through the trail sales, it was judged that the developed corn bread could be commercialized.</p> <p>Recipe of the corn bread was supplied to the local bakeries in Same and Baucau, to spread the sales of the developed corn bread to local areas. The supporting activity included in the procurement of corn and its flouring, as well as in Dili. Manufacturing process was also supported. Trial sales were popular with the neighboring consumers. It was expected to generate new corn bread making business in the local area.</p> <p>Manufacturing and sales activities, however, were suspended from January to March 2011. The reason is that it became difficult to make the corn bread at cheaper price as expected. Corn price jumped suddenly due to the poor harvest in the last year. It became difficult to procure corn and make flour at the designed price in the local market. (Imported wheat flour price also jumped, but, its rising rate was lower than that of the corn.). Besides the jumped price caused by crop failure, there was a negative comment from consumer that the developed corm bread became hard faster than the usual wheat bread, so that, its taste suddenly became poor. Furthermore, from interview survey, the Dili bakery mentioned that it was difficult to prepare new bread manufacturing line for this corn bread, in addition to the wheat bread line.</p> <p>To cope with these problems, small bakery who might maneuver more effectively for these problems was selected from Dili. Activity for improvement was tried by the selected bakery.</p>
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	<p>Corn flour could be procured at stable price from Maliana market. It was technically supported to try to improve manufacturing and sales method. The bakery improved the size of bread and tried door-to-door sales immediately after manufacturing to the neighboring fixed consumers. Such improvement trail was done well. At present, corn bread business is going smoothly, although the sales area was still limited.</p> <p>Manufacturing skill with recipe of the corn bread was transferred to the participated bakeries. The bakery in local city will be able to resume corn bread business observing the price fluctuation of the corn and wheat. This project is to support the bakeries' business through commercializing the corn bread. Judging from the performance so far, effectiveness of the implementation process was verified to be high.</p> <p>This project encourages the processing industry to develop new commodity by using domestic produce crops. However, it is precondition to start processing business that raw materials for processing should be procured stably in quantity/ quality and price aspects. Judging from the implementation process of this project, it can be said that it is crucial for processor to ensure procurement of raw materials.</p>
Lessons learned	<p><u>Target crop as raw material for processing industry should be produced stably in quantity, quality and price. To meet with this, it is required to be the crop cultivated and marketed widely in the country. It is important to find highly-motivated processors so as to encourage them to improve and develop commodity positively.</u></p> <p>Lessons learned from the procurement of corn flour, raw materials of target products should be provided stably for processing industry. To do so, when finding target products for processing, it should be considered that agricultural crops using as raw materials of processing products is desirable to be produced widely in the country and easy to get in the local markets.</p> <p>It is not easy to set up a new processing industry from the beginning. Then, when this project planning, it would be desirable to find processors/ who have positive sense of improving their produced commodities and developing new products. Much more technical/ financial support would be put on the selected processors.</p>
Feedback	<p><u>DNPIAC prepare the list of possible products/ commodities to be improved and developed. The list includes the name and capacity of existing processors/ processing groups. The list is useful to plan future processing project..</u></p> <p>A list of potential agribusiness products/commodities is prepared based on the production information about domestically produced and marketed crops such as rice, maize, root crops, beans, etc. Necessary support required to process those potential products/commodities are also compiled with the products list. The list can be used when target product found and processing project planed. DNPIAC should collect/ compile the information mentioned above and prepare the list.</p>

5-5-2 Provision of Agribusiness Information and Communication system

Verification	<p>This project is to provide market information of agricultural products so that agribusiness stakeholders such as private processors, farmers groups/ women groups, middlemen, traders, retailers and administrators can get at required time and operate their agribusiness. It is designed that DNPIAC collects necessary market information of agricultural crops and products from the district market, compiles them as database and send to the stakeholders as demanded. There is no effective agribusiness information and communication system so that agribusiness stakeholder can make use for their business.</p>
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	<p>Effectiveness was verified through the collection process of market information for corn and corn flour.</p> <p>In this pilot project, it was verified that in Dili and Maliana corn flour is an economically viable substitute for wheat flour.</p> <p>Wheat flour is 100% imported, and can be found widely throughout the country at a standard price of \$1.00/kg. Corn flour is not regularly produced in Timor-Leste but can be special ordered from small millers. Corn production and price varies widely by local geographic location. The only area of the corn consistently available at commercially viable prices is in Maliana. In Maliana, corn price in May 2011 was about half the price of wheat flour (i.e., \$0.55/kg). Unfortunately, due to generally poor road conditions and lack of equipment, transportation costs, except for the Maliana to Dili route, are prohibitively high. Market information is collected by each trader on their own method. Corn is one of the products purchased in the government purchasing system. In this, purchased price from farmers is decided.</p> <p>There is no market information system in place for the selling and buying prices and volumes of agriculture commodities. Usually such a system would help stakeholders to make fully informed marketing decisions and lead to market efficiency. However, at present, MTCI sets the price of most major commodities, including corn, by decree. The MTCI prices are widely known to stakeholder. Therefore, provision of an agribusiness information/ communication system under such conditions is of only limited usefulness.</p>
Lessons Learned	<p><u>Imported wheat flour is available throughout the country at a fairly consistent average price. Corn flour is not readily available anywhere in the country and sells presently at a prohibitively high price except in Maliana. Corn and/or corn flour can be transported from Maliana to Dili at a reasonable cost but not to other areas.</u></p> <p>Imported wheat flour price throughout Timor-Leste in April 2011 averaged \$1.00/kg. Although 80% of farmers produce corn, it is mostly consumed directly and yields are highly variable. Only a small proportion (e.g., less than 20%) is ever marketed. The result is that corn price varies tremendously depending on location and season. The only really commercially reliable area for corn production is in Maliana. For example, in April 2011, price for corn kernels in Maliana was \$0.44/kg versus \$1.39/kg in Baucau and in Same \$0.93/kg.</p> <p>In Maliana, where corn is consistently abundant, in April 2011 made-to-order corn flour could be purchased for about half that of wheat flour (i.e., \$0.55/kg). There are small corn millers at most other market places. However, these millers: (i) usually only work on market days; (ii) corn must be supplied by buyers; (iii) input costs and the resultant corn flour prices are often prohibitively high; (iv) millers are sometimes reluctant to change the grinding screens; and (v) millers accord priority to the higher paying small quantity “sasoro” customers.</p> <p>Corn shipments to Dili are relatively reliable and inexpensive at \$0.03/kg (i.e., \$1.0 for a 30 kg sack); so provided a secure financially viable supply contract is obtained, bakeries in Dili can be supplied with corn flour. This is not the case with other towns distant from Maliana. These areas suffer from both a lack of and a high price for transportation.</p> <p><u>Provision of agribusiness market information or communication systems is of only limited usefulness as long as MTCI is setting prices for all major commodities.</u></p> <p>MTCI sets the purchase price of major agricultural products. These prices are published and readily available to all stakeholders such as farmers, traders, flour millers, bakers, caterers and retailers. Under such a regime, the collection and dissemination of agricultural produce prices</p>

	<p>is redundant.</p> <p>If the MTCI system is halted, then introduction of a market information system combined with a communications network could help overcome a lack of commodity price information and lead to improved market access and improved market efficiency. Consumers would also benefit by having access to more products at lower prices.</p>
Feedback	<p>No raw wheat grain is usually available in Timor Leste. Corn is available throughout the country but only at consistently commercially prices in Maliana. Reasonably price imported wheat flour can be found throughout the country. However, corn flour at an economically viable price can only be obtained in Maliana.</p> <p>Corn product producers can operate financially viable operations only in Dili or Maliana. Dili bakery operations, however, depend on obtaining secure financially viable supply contracts with corn flour makers in Maliana. Other locations distant from Maliana such as Same, Baucau etc., cannot count on a reasonably priced supply of corn or corn flour.</p> <p>As long as the MTCI commodity purchase price scheme is in place introduction of an agribusiness information and communication program is not warranted.</p>

5-5-3 Support for Marketing Route Development

Verification	<p>This project is to support sales promotion of local agricultural crops and product. In the Draft Action Plan, MAF should develop comprehensive sales promotion strategy such as agribusiness fairs, use of market booths (antennae shop), promotion campaign 'Local product-Local consumption' , and promotion by media such as radio and newspaper.</p> <p>Effectiveness was verified through activity process to promote sales of corn bread.</p> <p>Related the corn bread, Timorese traditionally eat wheat bread (paõ) for breakfast. Its position is enshrined in local eating habits. Consequently, changing consumption patterns away from this traditional staple product is challenging.</p> <p>Fortunately, partial substitution of corn for wheat bread has been demonstrated under this pilot project. However, this was found to require a well conceived and executed strategy. The pilot project applied an integrated program of radio announcements, newspaper advertisements, banners, flyers and posters for the bakery's corn bread. After application of the market promotion program, participated bakery's corn bread sales rose to about 15% of total sales. Corn bread sales have continued at this rate.</p>
Lessons Learned	<p><u>Radio was the most effective media channel followed in order of effectiveness by newspapers, banners, flyers and posters.</u></p> <p>Approximately 400 promotional flyers were distributed to sales kiosks and the NGO forum. Over 20 posters were placed at the major Dili supermarkets and at the participated bakeries. Radio advertising was conducted on both Radio Timor-Leste (RTL) and Radio Timor Kemanek (RTK). In addition, Timor Pos and Suara Timor Leste newspapers carried corn bread advertisements. In each case, the materials were professionally done and contained information about corn bread benefits plus the producers' name, address and telephone numbers. The campaigns were very effective in reaching many interested consumers. Consequent consumer response was positive.</p> <p>Unfortunately, in none of these cases, did the materials include a sales time, specific pickup point information or delivery options. Potential customers did not know when or where to go for corn bread (paõ) and hence possible sales were lost. The producer must have a carefully</p>

	<p>crafted strategy to address responses to advertising and then must be prepared implement the strategy. Under the pilot project, all the media provided bakery telephone numbers. However, the bakery's telephone answering strategy and follow up service was not well coordinated. Consequently, telephone replies were inconsistent. At best, potential customers were only advised to come to the bakery, where corn bread sales would be at an approximate time. At worst, they received no clear information. Also once at the sales point, the sales staff were sometimes not well informed and did not actively support corn bread sales or even have up-to-date information on sales schedules and corn bread availability.</p> <p>Radio advertising generated the most consumer responses. During the course of the radio announcements, participated bakery had on average 5 inquiries per day. Newspapers produced about 3 inquiries per day, banners and flyers 2 per day and posters 1 per day.</p>
Feedback	<p>Prior to market promotion, a media response strategy needs to be developed and accepted by the producer. Then when the media campaign is conducted, it should be coordinated with promotion at the point of sales.</p> <p>Radio, newspapers, banners and flyers are all good media channels for new product promotion. Determination of which to use is largely dependent on budget considerations. Posters were found to be of limited usefulness.</p>

CHAPTER 6 SUPPORT FOR 'LOCAL PRODUCT, LOCAL CONSUMPTION' – COOKING CLASSES –

6-1 IMPLEMENTATION PLAN

6-1-1 Objective

The project aims to extend local consumption of domestic farm products such as corn, potato, and cassava, through disseminating the way of cooking using local farm products by introducing cooking classes in which rural women can learn it.

6-1-2 Verification Theme

- The possibility of increasing in demand of domestic farm products through disseminating the way of cooking by using them
- The possibility of setting up small-scale cooking service business by rural women who have learnt the cooking in the cooking class.

6-1-3 Action Plan

All sorts of recipes which use local farm products and seasonings available in local markets are devised to promote local consumption and local products. Cooking class is planned to introduce the recipes to rural people. Participants learn the way of cooking in the classes. The cooking class teaches effective aspects of nutrition and hygiene with the cooking.

Action-1; Operation for opening cooking classes

Recipes are devised and cooking books are provided for opening the cooking classes. Opening the cooking classes is schemed in the target areas to introduce way of cooking to rural people.

1-1 Developing recipes using local farm products

Recipes which use locally produced farm products are devised. Those recipes incorporate in nutritious aspects. Good hygiene concept is also taught in the cooking course. Some recipes are picked for the cooking classes.

1-2 Making cooking book

Cooking book is provided for training cooking instructors. The book is based on the recipes and learning from past cooking classes.

1-3 Training cooking instructors

Cooking instructors who are supposed to act as lecturers in the cooking classes are recruited from the target districts. They are trained as the instructors for the cooking classes. The training subjects include both aspects of nutrition and hygiene.

1-4 Monitoring the operation of cooking classes

Operating progress of the cooking classes is monitored in each target area. Based on the monitoring results, operation method may be improved for next cooking classes.

Action-2; Opening the cooking class in Dili

Cooking classes are opened in Dili.

2-1 Providing kitchen facilities/ equipment for opening the cooking class

Kitchen facilities/ equipment and utensils are provided in the opening sites. Necessary

materials including local farm products are procured.

2-2 Inviting participants in the cooking class

Participants in the cooking class are invited through a poster and a medium.

2-3 Opening the cooking class

Cooking class is opened and operated by the trained instructors.

Action-3; Opening the cooking class in Local

Cooking classes are opened in the local target areas.

3-1 Providing the kitchen place for cooking class

Suitable place to open the cooking class is found. kitchen facilities/ equipment and utensils are provided in the place and necessary materials including local farm products are procured.

3-2 Inviting participants of cooking class

Participants in the cooking class are invited through a poster and a medium.

3-3 Opening the cooking class

Cooking class is opened and operated by the trained instructors.

Action-4; Support for cooking service business activities

The activity is planned to support women groups who have learned cooking skill from the cooking class in receiving order of cooking service from rural event, etc. It also encourages them to set up cooking service business.

6-1-4 Action Group and Implementation Organization

Implementing body	: DNPIAC, District agricultural office in Baucau, Viqueque, Aileu and Ainaro
Technical assistance	: TE (Timor Endeavor ;NGO); Lecture on hygiene/ nutrition, preparation of cooking recipe CV (Christian Vision; NGO) and ETDA(East Timor Development Agency; NGO); Opening cooking classes in Dili and local city Cooperativa Esperanca; Preparation of cooking book
Monitoring	: NGOs, DNPIAC in cooperation with district agricultural office
Related organization	: DNPIAC, District agricultural office in Baucau, Viqueque, Aileu and Ainaro
Target group	: Participants in the cooking classes.; total graduates 297 persons

6-2 PDM, ACTIVITY PROCESS AND MONITORING

6-2-1 PDM

PDM for this project is shown in Table 6-2-1.

6-2-2 Activity Process

Activity	Working Progress	Problem Arisen	Measure
Select Recipes	Collected over 120 relevant recipes and from these selected 15 recipes for the cooking classes plus an additional 21	It was difficult to find reference cookbooks in East Timor. Most Internet re-sources are inappropriate styles of Western and/or	The JICA Study Team and Pilot Manager brought cookbooks from Philippines, Indonesia, Singapore and the USA. Plus recipes were collected from

Activity	Working Progress	Problem Arisen	Measure
	recipes for inclusion in a cookbook.	Asian cooking. There is a lack of Timorese recipes both in print and on the Internet.	local women; and then adjusted to produce more healthy recipes.
Draft Recipes	36 recipes were completed in English and Tetun.	Some recipes called for imported flavorings, which were either unavailable or prohibitively expensive. Some recipes used an excessive amount of saturated fats.	Substituted locally available low cost flavorings for special imported flavorings. Recipes were adjusted to reduce fats and substitute unsaturated or mono-saturated fats for saturated fats.
Draft Nutrition, Hygiene, Safety Materials	Cookbook manual sections (later used as cookbook chapters) were completed.	Nutrition section needed to be simple but still contain vital information.	The Pilot Manager offered simple explanations and made attractive posters to convey information. Class evaluation exams found that 85% of participants understood materials
Improve Facilities	Facilities were improved at ETDA in Dili and Christian Vision in Baucau, Aileu, Same and Viqueque.	Facilities needed upgrading to accommodate training. Safety inspections revealed fire hazards (e.g., no fire extinguishers), poor ventilation and lighting. Also cooking equipment (e.g., food processors and pressure cookers) were needed.	The Project provided additional cooking equipment. Most of the cooking equipment was readily available in local markets. The JICA Study Team advised the NGOs to procure fire extinguishers; and to provide better lighting and ventilation. Generally, NGOs accommodated the JICA Study Team's requests for facilities improvements, except that fire extinguishers were not purchased.
Select/Train Instructors	Selection of 13 Instructors was made by NGOs; and trained by the Pilot Manager. The instructors were selected from those already employed by the NGOs as cooking instructors for their own confectionary cooking classes.	Instructors spoke only Portuguese and/or Tetun; while JICA Study Team and Pilot Manager only spoke English. Consequently, an interpreter was required.	An interpreter was recruited and used throughout the Instructor training. The number of Instructors trained exceeded the project target by 30%.
Recruit Participants	Sufficient numbers of participants were easily	Both cooking class NGOs were already teaching classes	No problem encountered.

Activity	Working Progress	Problem Arisen	Measure
	recruited by the experienced NGOs.	on a variety of topics. As such they were already very experienced in participant recruitment. Recruitment techniques used included: (i) telephone campaigns; (ii) announcements in existing classes; (iii) church announcements; and (iv) radio broadcasts. The Government also recommended candidates from local womens' NGOs. In all cases, the NGOs attracted sufficient numbers to fill the classes.	
Conduct Classroom Training Sessions	21 cooking class units each containing eight +/- 1 hour classroom sessions were completed. Topics covered were nutrition, hygiene and kitchen safety.	Approximately 20% of participants had very poor reading and writing skills. Participants were almost entirely lacking in an understanding of the training topics.	Instructors made maximum use of illustrations, blackboards and stories to convey information. The Instructors required extra time to carefully explain the importance of nutrition, hygiene and safety.
Conduct Cooking Classes	21 cooking class units each containing eight +/- 2 hour cooking sessions were completed.	Instruction was given in hygiene and the participants provided with aprons and hats. However, at first they were reluctant to wear them.	The Pilot Manager explained the importance of hygiene and directed Instructors to correct Participant behavior, which they did with full Participant compliance
Participants utilize learned recipes	Follow-up survey found that the learned recipes are applied in the home more than twice/week. This exceeds the project expectations by 100%.	Some of the ingredients are only seasonally available at low prices.	The NGOs altered recipes to use ingredients more readily available year round.
Sell products based on learned recipes	Follow-up survey found that more than 50% of Participants (+/-150 women) sell learned recipe products through catering arrangements.	Participants often lack business and marketing (e.g., packaging, labeling, pricing) skills.	Follow up training should be considered for those primarily interested in using recipes for sales.
Publish cookbook	Cookbook text is available but the cook book has not yet been published.	Cookbooks could be improved by more sophisticated editing	MAF should consider up-grading and disseminating the cookbook.

Activity	Working Progress	Problem Arisen	Measure
		<p>(especially in Tetun), better layout, professional publishing.</p> <p>Limited numbers of cookbooks will be available; and so a carefully thought out distribution strategy is required.</p>	<p>The cookbooks should be made available to those who will use them most effectively. It is recommended that priority be given to: (i) MAF, DNPIAC gender program managers; (ii) CV and ETDA cooking class management and instructors; (iii) MAF district women's group leaders; (iv) other donors with related programs; and (iv) cooking class participants.</p>

		
<p>Vice Prime Minister and MAF Secretary of State visit cooking class participants' exhibition of local food products at UN World Food Day.</p>	<p>Cooking Instructors training session at Christian Vision's Dili kitchen.</p>	<p>Cooking class graduates selling local products at a national festival. In Dili a participant has started her own local products restaurant.</p>
		
<p>Aileu cooking class participants actively taking notes on nutrition, health and safety topics.</p>	<p>Participants attending hands on cooking session at ETDA's Training Center kitchen.</p>	<p>Typical cooking class products including (left to right): (i) sweet potato casserole; (ii) saboko fish; (iii) spicy seaweed/tomato sauce; (iv) jackfruit compote.</p>

Table 6-2-1 PDM for Support for 'Local Product, Local Consumption' - Cooking Classes –

Project Name: Support for 'Local Product, Local Consumption' - Cooking Classes -
Target Group: Trainees of the cooking classes in Dili, Aileu, Same, Baucau and Viqueque

Duration: 1.5 years from February 2010

Narrative Summary Overall Goal	Objectively Verifiable Indicators	Means of Verification
<p>The consumption volume of domestically produced agriculture products increases significantly for those households, where a family member attended the cooking classes.</p>	<p>The consumption volume of domestically produced agriculture products increases by 10% for those households, where a family member attended the cooking classes a year after Project completion.</p>	<p>Third party NGO survey plus instructor interviews.</p>
<p>Project Purpose New recipes for dishes using domestically produced agriculture products are disseminated through training local women in cooking classes. Secondary purposes include training in nutrition, hygiene and safety.</p>	<p>The trainees make the newly learned dishes at least twice a month. Trainees apply their knowledge in nutrition, hygiene and safety.</p>	<p>Third party NGO survey plus instructor interviews.</p>
<p>Outputs 1) Recipes for the cooking classes are selected. 2) Class manual with recipes, nutrition, hygiene and safety documentation is prepared. 3) The NGO training facilities are improved. 4) The instructors are selected and trained. 5) The participants learn the class materials and practice cooking. 6) Participants utilize new recipes and nutrition, hygiene and safety knowledge. 7) Participants sell new products based on cooking class recipes. 8) The cook book is published and disseminated.</p>	<p>1) 15 recipes for the cooking classes are selected. 2) Class manual (recipes, nutrition, hygiene, safety) is provided. 3) Implementing NGOs are satisfied with the improved facilities. 4) 10 instructors are selected and trained. 5) 280 students learn recipes, nutrition, hygiene and safety materials. 6) Participants utilize newly gained recipes and knowledge 7) Participants sell new products based on cooking class recipes. 8) Cook book covering recipes and other topics disseminated.</p>	<p>1) List of recipes provided to JICA Study Team 2) Class manual distributed to cooking class participants 3) NGO final reports; field checks by Proj. M'ger & JICA Study Team 4) NGO final reports; confirmation by Project Manager 5) NGO final report; cross checks by Proj. M'gr & JICA Study Team 6) 3rd Party NGO Survey; instructor interviews by JICA Study Team 7) 3rd Party NGO Survey; instructor interviews by JICA Study Team 8) Cook book covering recipes and other topics disseminated.</p>
<p>Activities 1) Selection of the recipes for the cooking classes 2) Drafting recipes 3) Drafting nutrition, hygiene and safety materials 4) Improvement of the facilities for the cooking classes 5) Selecting and training of instructors 6) Conducting cooking classes 6-1) Recruiting participants 6-2) Conducting classroom training sessions 6-3) Conducting the cooking classes 7) Utilizing cooking class recipes and knowledge in the home 8) Selling new products based on cooking class recipes 9) Producing, publishing and distributing cook book 10) 3rd Party NGO Survey</p>	<p>JICA Study Team Side Personnel 1) Timor Endeavors (Pilot Manager) 2) Christian Vision (Cooking Class NGO) 3) ETDA (Cooking Class NGO) 4) Esperanca (3rd Party Survey NGO) 5) JICA Study Team</p> <p>Provision of Machinery and Equipment 1) Repair of classrooms and kitchens 2) Cooking equipment 3) Generators 4) Food materials</p>	<p>Timor-Leste Side Personnel 1) Cooking class participants 2) MAF National Staff - Dili 3) MAF District Staff - Aileu, Same, Baucau and Viqueque</p> <p>Building and Facilities 1) Classrooms 2) Kitchens 3) Kitchen Equipment 4) Power, water and waste system</p>

6-3 FINAL EVALUATION

6-3-1 Implementation Organization

Implementing organizations included Ministry of Agriculture and Fisheries, National Directorate for Industrial Crops and Agribusiness and 4 NGOs (1 NGO pilot project manager, 2 implementing NGOs, which operated cooking classes; and 1 NGO, which undertook a completion survey). The primary beneficiary groups were the cooking class participants.

(1) Ministry of Agriculture and Fisheries, National Directorate for Industrial Crops and Agribusiness

Ministry of Agriculture and Fisheries, National Directorate for Industrial Crops and Agribusiness (MAF, DNPIAC) actively supported the pilot during both its design and implementation and continued activities with its own finance. Officials assisted the JICA Study Team with pilot conceptualization and design. Their input was very helpful in definition of goals, purposes and the work plan. In addition, officials located the Pilot Manager and the Dili based implementing NGO. They also suggested key district participants from the local women's agribusiness groups. MAF officials from both national and district levels attended opening and closing class ceremonies. Their presentations covered messages about the importance of using local crops for both good nutrition and as value added sales items. Participating officials included: MAF General Director, MAF Agribusiness Director and the MAF District Directors and their staff. MAF has already demonstrated they have the capacity to effectively promote a "Local Product- Local Consumption" cooking class program. In fact, they are already doing so. For example, in October 2010 MAF, DNPIAC utilized their own budget to have Participants prepare class learned recipes for a national exhibition, UN's World Food Day. And during 2011 May Independence celebrations, MAF DNPIAC organized an exhibition for sale of locally produced foods. Capacity is there. However, ultimately the key factor will be MAF's interest level and commitment. Based on prior experience, although senior male staff are supportive, women staff appear better motivated and more suitable to manage day to day activities of the program.

(2) NGOs

A. Overall project management NGO

Timor Endeavors

Timor Endeavors (TE) was the project management NGO. It oversaw documentation preparation, instructor training, pilot implementation and final survey and report preparation. TE's production of technical materials (nutrition, health, safety) and recipes was very good. The information was presented in a practical and easily understood format. This information formed the basis of a class room manual, portions of which later were used in the cook book. The NGO also functioned well in provision of other documentary needs such as equipment lists, course plans, budgets, evaluation reports, etc. The Pilot Manager had an excellent grasp of the technical subjects; and was able to effectively train class instructors and generally oversee district level implementation. TE performance was well suited to the pilot needs.

B. Implementing NGOs

Christian Vision

Christian Vision (CV) was responsible for cooking class implementation in the 4 districts of Baucau, Same, Aileu and Viqueque. Based on class evaluation test results, Pilot Manager's appraisal and JICA

Study Team assessment, their performance was rated as excellent. It is recommended that Christian Vision be considered as an executing agency for similar future projects.

CV's goal is to help people in all practical ways. It is not run for economic gain; and, as such, exhibited outstanding motivation and dedication to purpose. The charity has a nationwide reach with operations in nearly all districts. Their facilities are well designed, clean and centrally located in all the country's major towns. In Timor CV has a good depth of staff with 40 missionaries hailing from Brazil supported by over 100 national personnel. In addition to their church services, Christian Vision's uses radio station, FM 89.5 VOZ as an outreach vehicle. It broadcasts 24 hours per day with live transmissions during the day. Broadcasts are in Tetun, English, Portuguese and Indonesian. As a result of their broadcasts plus announcements at CV's church services, the pilot had no difficulty recruiting Participants.

The CV teaches classes in Portuguese language, computer technology and cooking throughout the country. To instill a sense of commitment, all participants must pay a small tuition fee. Although the CV had previous experience with cooking classes, which started in 2003, the intent of their classes was to provide general lifestyle enhancement. The CV instructors had hands-on experience but no theoretical training. They had no local product use, nutritional, hygiene or safety goals. This new information had to be taught by this pilot project; but has now been thoroughly assimilated by the cooking instructors. CV has 16 senior Brazilian cooking instructors. Several helped for course preparation and 4 served as Instructors. All are well educated, with prior culinary teaching experience and fluent in both Tetun and Portuguese. Each Brazilian instructor was assisted by a Timorese instructor. These Timorese instructors are now able to manage classes by themselves.

Prior to the pilot, Christian Vision already had the basic human and physical resources to successfully implement the program but lacked some training, equipment and operating funds. The pilot assisted them with instructor training, generators, facilities upgrades and cooking equipment. The only minor constraint is that the Ailieu facility is small, which limits the number of students and requires classroom training in the kitchen area.

Since the demand for cooking classes is greater in Baucau than Viqueque, after completion of the pilot, the CV moved the project provided Viqueque equipment to Baucau. While this may allow for the training of the maximum number of Participants in the future, it leaves Viqueque without the capacity for further culinary training.

In each of the 4 districts, 4 courses comprised of 8 classes each were conducted over a 5 month period (8 June – 15 November 2010). Thus, the total number of courses offered was 16 and the total number of classes 168. In total 223 participants were trained. About 125 Participants were given evaluation examinations. Despite not being all inclusive, the Participants who did take the evaluations examinations were not pre-selected; and are believed to represent a fair cross section of class attendees. Based on evaluation examinations, the average test score for correctly understanding the course material was an impressive 85%. This demonstrates that the nutrition, hygiene and safety information was properly assimilated and retained. Practical cooking tests were also administered with similar good results. Based on the third party NGO Evaluation Survey over 50% the Participants have gone on to generate extra household income through occasional provision of home-based catering services.

Christian Vision is very well positioned to expand the geographic scope of their cooking classes.

They are already positively motivated, are experienced recruiters, have a core of trained experienced instructors and have a base in all the country's major cities.

East Timor Development Agency

East Timor Development Agency (ETDA) is a Dili based independent non-profit NGO. It's the mission is to strengthen the development capacity of the Timorese people. The ETDA was founded in 2000; and is managed and operated by national staff. ETDA runs centers for training, business/resources and employment as well as overseeing an orphanage fund. It has excellent facilities, which include a kitchen, 3 classrooms, 2 computer training rooms, an Internet café, a language laboratory, a meeting room, a conference hall and administrative offices. ETDA has a core staff of about 10 permanent professionals, who offer a total of over 30 courses per year.

ETDA's instructors and facilities were very well suited to the pilot. The classrooms and kitchen were particularly good. The 2 cooking class instructors were very familiar with how to cook; but had only limited prior knowledge of nutrition, health and safety. However, after training by the Project Manager they were easily able to acquire these additional skills. ETDA has an extensive network of Dili contacts plus an excellent outreach program so had no problem recruiting participants.

ETDA offered 5 courses comprised of 8 classes each conducted over a 7 month period (17 May – 17 December 2011). The last class which ended in December offered the same course material but meet more often per week (3 versus 2 times/week) over a shorter period. However, the same material was covered; so in total, the number of classes was 60. In total 74 participants were trained; and all took evaluation examinations. Based on evaluation examinations for the first 4 groups, the average test score for correctly understanding the course material was an excellent 83%. These strong ETDA results demonstrate that the nutrition, hygiene and safety information was properly assimilated and retained. Practical cooking tests were also administered with similar good results (84% skill knowledge). Based on the third party NGO completion survey over 50% of the participants have gone on to generate extra household income through provision of home based catering services and one has started a local products restaurant.

Cooperativa Esperanca

Cooperativa Esperanca (Esperanca) is a Dili based, independent, non-profit NGO. Esperanca's office is located in Dili; and is equipped with computers and basic office equipment. Its mission is to serve the cooperative movement, especially to develop savings and loan cooperatives. The Esperanca was founded in February 2009 and is run by a manager and employs several office staff. It has implemented projects for a range of clients including the Timor-Leste Government, USAID, and NGOs such as Belun, ETADep, USC (Canada) and Paz y Desarrollo (Spain). Esperanca's management has proven itself technically competent, motivated and professional. Their services and reporting are preformed on time in a well organized and professional format. According to JICA Study Team and MAF assessments, their performance is rated as very good. It is recommended that Esperanca be considered as an executing agency for similar future projects.

6-3-2 Final Evaluation

Items	Final evaluation
Validity (Score: 3)	<p>The “Local Product, Local Consumption” cooking class’ overall goal, project purpose and outputs remain consistent with Government’s development policies of import substitution, family health improvement, gender equity and economic development goals. One of the nation’s primary objectives is to promote agricultural policies that lead to food self sufficiency and food security. Timor-Leste does not produce sufficient staple foods to meet its demand. To make up for the shortfall, it annually imports over 100,000 mt of staples. This pilot is designed to shift household food demand away from imports to locally produced crops; thus promoting import substitution and lowering foreign exchange losses. It also has secondary goals, which again reflect the Government priorities of: (i) promoting better family health through improved nutrition and hygiene; (ii) gender equity and (iii) economic growth through small business development. Over 90% of participants are women, over 50% of which use their newly acquired knowledge to sell products through catering services, thereby alleviating poverty through boosting women and household incomes. In all cases, the participants were required to pay a small tuition charge to attend the cooking classes. Despite this cost, cooking classes were generally oversubscribed indicating that the pilot was well directed at target groups needs. From the donor perspective, the pilot addresses cross cutting issues such as poverty alleviation, health improvement, gender equity and economic development.</p>
Effectiveness (Score: 4)	<p>The pilot’s purpose to increase consumption of local produce with related nutrition, hygiene and safety benefits by participants has exceeded expectations. The pilot’s output is the 297 women trained, which is 6% greater than the original target number of beneficiaries. The third party NGO Evaluation Study, JICA Study Team, NGOs and the Pilot Manager estimate that each participant now cooks a class recipe at home at least twice a week, which is double the project target. With an average household size of 6 persons, approximately 3,564 meals using the new recipes are served per week. There is no accurate method to determine the actual import substitution impact of the use of class inspired recipes. However, interviews with class participants indicate that an estimated 25% of the new meals do replace imports (about 0.075kg/meal). If so, then the annual increase in demand for local food crops is approximately 14 ton (0.076 kg/meal X 3,564 meals/week X 53 weeks). Such an increase although modest is in the right direction. Surveys also found that 85% of participants correctly understood the pilot’s nutrition, health and safety information. Consequently, the pilot’s social purposes have been achieved, which should result in a rapid improvement in family health. In the future, effectiveness could be improved by: (i) increasing the number of villages covered; (ii) increasing the time allocated for training new instructors; (iii) extending the length of the class; (iv) providing more safety, first aid and environment training and equipment (e.g., first aid kits, fire extinguishers); and (v) adding a class especially for those wanting to gain more business training.</p>
Efficiency (Score: 5)	<p>The total input cost, which includes: (i) personnel (management, technical, and implementation); (ii) machinery and equipment and (iii) food supplies, is estimated at \$66,000. Over \$1,150 in tuition fees was collected from participants resulting in a net cost of \$64,850. One time start up costs for course material preparation, equipment and facilities improvement represents 70% of net cost. The remaining direct training costs are about \$19,750, equivalent to \$66.50/ participant. Per session per participant cost, which</p>

Items	Final evaluation
	<p>includes instructors, facilities, utilities and food, is \$8.31. Considering that a single session lasts 3 hours and includes a meal, the cooking classes appear to be a cost effective investment.</p> <p>The management systems functioned efficiently at all levels between the JICA Study Team, the Pilot Manager and the 4 NGOS (TE; ETDA; CV; Esperansa). The result was that all the inputs were delivered on schedule. Numerous site inspections by the JICA Study Team and the Pilot Manager confirmed that during the implementation period, the human resources, equipment and supplies were properly utilized.</p> <p>After pilot completion, to serve more potential participants, CV moved the Viqueque equipment to Baucau. This leaves Viqueque without the equipment needed to continue the classes.</p> <p>A model class, which provides 8 \$/student as assistance of the tuition fee for 891 students a year, was assumed in accordance with the results of the project. If food material is saved \$0.25/kg through import substitution, which is the case of the substitution from import wheat flour to domestic corn flour, the B/C ratio is 1.0.</p>
Impact (Score: 3)	<p>The pilot's positive and intended impact to increase consumption of local produce with related nutritional, hygiene and safety benefits by Participants has exceeded expectations; and is described in "Effectiveness" above. Participant families are now purchasing more locally produced fruits and vegetables, eating more nutritious meals, while living and working in a cleaner and safer home environment.</p> <p>In addition, there are a range of unintended positive impacts, These include: (i) approximately 150 participants occasionally gain extra income by catering events; and one (1) has started a local product restaurant; (ii) increased awareness of Government officials of the importance of women to boost locally produced food consumption; (iii) 13 trained instructors, who continue to teach the course content beyond pilot completion; (iv) upgraded classrooms at the NGOs are in constant use teaching cooking, language and computer courses; and (v) NGOs have been made aware of deficient safety conditions in their facilities and taken action to correct the problems.</p> <p>An unintended negative consequence is that some of the most appreciated and best selling items are pastries and deep fried foods, which are neither nutritious nor healthy.</p>
Sustainability (Score:4)	<p>Transfer of recipes and knowledge has been excellent. Approximately 150 participants use the learned recipes to occasionally generate extra income through catering sales; and 1 has started a restaurant. Another example is that in October 2010, one of the Viqueque trained participants won 1st prize of \$2,000 in a national cooking completion. She plans to use the funds to start a local product, local consumption restaurant with other trainees in Viqueque.</p> <p>Both ETDA and Christian Vision will continue to offer cooking courses based on the pilot recipes. At both NGOs, the improved classroom and kitchen facilities remain in constant use; the pilot trained staffs have been retained on a permanent basis; and management systems remain strong. In addition, ETDA has begun a catering business based on the cooking class recipes. Plus ETDA sees further excellent potential in training Timorese for work as chefs in the hotel and restaurant sector.</p> <p>Both cooking class NGOs have confirmed that there remains a strong demand for the cooking classes. No new materials are required. The cookbook produced under the pilot can continue to be used for new classes. The existing cookbook contains 36 recipes of</p>

Items	Final evaluation
	<p>which each class only requires 8. More classes, using the skills and information developed under the pilot, can be offered in existing areas. Plus CV has surveyed rural conditions and believes there is also a high level of demand for cooking classes in areas not covered by the pilot. Furthermore, CV is ideally positioned to operate throughout the country. They are positively motivated, are experienced recruiters, have a core of trained experienced instructors and have a base in all the country's major cities. Plus their radio system, Radio VOZ, is an excellent mechanism to reach remote communities throughout much of the country.</p> <p>During the pilot period CV charged a tuition fee of \$3.00 in Baucau and \$1.50 in other places. ETDA's tuition charge was \$8.00. The direct cost of pilot cooking classes is estimated at \$66.50 per student. Clearly, during the pilot the fees were not sufficient to cover costs. Sustainability can only be maintained if either costs are lowered and/or tuitions raised. Both NGOs intend to address these concerns; and continue with classes. EDTA plans to increase tuition to approximately \$20 per participant and then select those recipes, which have lower priced ingredients. Since ETDA operates on a self sufficiency basis it is reasonable to assume that can attract sufficient students to make a profit at this tuition level. CV has a different approach to sustainability. They also plan to select those recipes, which have lower priced ingredients. However, since they operate mostly in small towns with less disposable income, consequently they plan to maintain their low tuition levels. The shortfall in costs, CV will make up by subsidizing the classes, which they see as a part of their mission to better the people of Timor-Leste.</p> <p>Further donor and/or MAF support could accelerate and improve implementation of CV, ETDA and other NGO's future culinary programs. MAF could best assist through continued financial support, provision of marketing opportunities at government sponsored events and coordination with the MAF agribusiness womens' groups especially in the districts.</p>
Total Score: 19	

6-4 EVALUATION OF THE VERIFICATION THEME

(1) Potential to Increase Demand for Domestic Agriculture Products Through Extension of Local Product Based Recipes

Traditionally the Timorese diet was very similar to those throughout the Pacific and consisted principally of root and tree crops. However, foreign influences caused a major change in food consumption patterns. Wheat was brought by the Portuguese and rice by the Indonesians. Social pressure was exerted to eat these more "sophisticated" commodities. The result is that today paõ and rice have become primary staples. Neither is produced in country. Importation of rice and wheat now amounts to over 100,000 ton per year. In addition, throughout Timor-Leste there is a trend to consume more imported, highly processed foods, which are easy to prepare. A clear trend has emerged away from the traditional, healthy diet towards more modern convenience foods (e.g., noodles, pre-packaged spices, etc.).

As demonstrated by this pilot project, opening of cooking classes, excellent potential exists to reverse the trend of imported food consumption and boost demand for local agricultural products. The result is not only a reduction of imports but also improved health benefits. The pilot project collected traditional

recipes and modified them to be healthier and easier to prepare. The classes then introduced recipes, which were wholesome, nutritious and delicious. Typically, in rural Timor-Leste foods are either boiled or roasted without addition of spices. These recipes produced a welcome alternative to standard, bland foods. All the recipes were very well received.

According to the follow-up survey of the graduates, it is estimated that each cooking class participant now prepares a class learned recipe at home at least twice a week. With an average household size of 6.0, approximately about 300 graduates serve 3,600 meals per week using the new recipes. These meals will generate an increased demand of domestically produced agricultural products. If the cooking class programs proceed, demand of domestic products will be continued to increase.

(2) Possibility of Establishing Small-scale Culinary Businesses by Cooking Class Participants

According to the follow-up survey of the graduates, it became evident that many of the graduates were using their newly acquired skills and recipes for income generation. In fact, the survey indicated that over 50% of cooking class graduates are already using the new recipes to sell products through provision of occasional catering services. One graduate has even opened a “Local Product - Local Consumption” restaurant in Dili; and another graduate is currently constructing a similar restaurant in Viqueque. These very positive findings indicate not only the possibility, but the reality, of establishing small-scale culinary businesses by cooking class participants.

Clearly, most cooking class graduates would like to earn extra income by opening and/or improving their catering services and small restaurants. Unfortunately, participants are usually lacking in business skills; and would benefit from learning basic management, bookkeeping, budgeting, credit and marketing. Consequently, to bolster the startup of new culinary enterprises, it would make sense to follow up the pilot project with a second round of cooking classes, for example, called like "Cooking for Income". The new class should be geared at teaching basic entrepreneurial skills as applied to culinary services.

6-5 LESSONS LEARNED AND FEEDBACK TO THE ACTION PLAN

Effectiveness of the Draft Action Plans was verified based on the implementation process and generated outputs. Lessons are also learned from this pilot project implementation processes. Obtained lessons are incorporate into the finalization of the Action Plans. Consideration of the lessons, experiences and verification results and feedback item were compiled as follows.

6-5-1 Support for Set-up of Processing Industries by Farmers/Women’s Groups

Verification	<p>This project is to support farmers’ groups/ women's groups in setting up/ operating and managing agribusiness activities using locally produced agricultural materials. Supporting activity is largely dependent on target crops and products/commodities.</p> <p>Effectiveness was verified through the cooking classes aiming to increase demand of local products and create a commercial sense of the graduates.</p> <p>The pilot project provided cooking classes to learn cooking method making full use of local agricultural products. The cooking class not only trained cooking skill, but also taught hygiene sense in the kitchen and nutrition aspect of food. This cooking class project was accepted by</p>
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	<p>many people. Total graduates reached to 297 people. Although the opening of cooking class was completed, there are many persons who hope to participate in the class to learn the cooking. NGOs provided the training place and operated the class. The NGOs consider that it is possible to continue to open the cooking class by collecting some amount of fee from students so that it is payable for them. Total 36 cooking recipes were picked based on the reputation of class students. Picked recipes were compiled as the cooking book. It is expected to distribute the book to DNPIAC and NGOs so as to make full use for promotion of cooking skill.</p> <p>According to the follow-up survey of the graduates of the class, it was found that there are some graduates who started catering service of cook and are tackling to open the restaurant. (Graduate from Viqueque class, is the winner of the cooking contest organized by Prime Minister Office. The winner is preparing to open the restaurant in Viqueque with the capital from the winner's purse. One graduate opened the restaurant named 'Local product, Local consumption' in Dili.) Some graduates began the catering service. Through the opening the cooking classes, such good results generated. Financial capacity of local women is very weak. If administration would provide a kind of subsidy system for such woman who has positive will to set up a kind of cooking business, it could cause to generate easily commercial sense to graduated women. Resultantly, it would bring to make processing and marketing fields in local area active. NGOs opened the cooking classes are planning to create new course related with 'cooking business'. Target student is put on the persons aiming to set up business such as restaurant and catering service.</p> <p>It is judged from the outcomes from the cooking class and reputation, effectiveness of this project activity for women groups is considered to be high. Cooking business such as catering service and opening the restaurant in the rural area may be linked with the campaign 'Local products-Local consumption' stated in the government policy. The cooking class project contributes to increase demand of local agricultural crops.</p>
Lessons learned	<p><u>Cooking class might bring graduates to grow an awareness of cooking business.</u></p> <p>Participants in the cooking classes had interest in making cooking use of local familiar crops including their nutritional aspects. This interest could also give rise to the awareness of cooking business among the graduates. It was surveyed that there were the graduates who start catering service of cook and opening restaurant. Learning from cooking class may be useful to create graduates to the cooking business and lead to new processing activity.</p>
Feedback	<p><u>DNPIAC lead to open the cooking class in all district.</u></p> <p>DNPIAC organize to open the class in all district, in cooperation with NGOs who have experience of the pilot project The class makes use of the cooking book prepared by the pilot project. MAF works on to MED, Prime Minister Office and related organizations to establish a kind of subsidy system to support graduates in starting cooking business.</p>

6-5-2 Support for Specialized Products

Verification	<p>This project to supports local farmers groups/ women groups in finding specialized products from local agricultural crops, and livestock/ fishery products, and developing them as new commercialized commodity, developing market route and selling them in the market.</p> <p>Practiced activity in this pilot project did not directly focus on the supporting activity for specialized products. In the Draft Action Plan, it is planned as the first step that target group finds products to be specialized.</p>
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	<p>It was considered that this cooking class project "Support for 'Local Product, Local Consumption' -Cooking Classes-" was useful to help participants to be aware of the usefulness of agricultural crops through learning cooking skill and its nutrition aspect. If any class graduates could participate in finding process of target products, this project 'Support for Specialized Product' would be enhanced.</p> <p>SIPI campaign (implementation period from May 2008 to May 2010) was conducted under the assistance with JICA. Commodity such as jams and chips were developed and marketed. In the course of the development, crucial subject to be solved was how to package and check its quality at the commercialized time. It is required to provide technical and financial supports to procure processing and packaging machine, as well as the project 'Setting-up of processing Industry'.</p>
Lessons learned	<p><u>Knowledge and cooking skills learned in the cooking classes would be helpful for finding products to be specialized in the locality and its commercializing process.</u></p> <p>Cooking class graduates learned usefulness of local agricultural products and cooking methods. Learning process and obtained knowledge and cooking skill may motivate them to finding possible local specialized products and commercializing them.</p>
Feedback	<p><u>Cooking class graduates are encouraged to participate in finding specialized products.</u></p> <p>Cooking class graduates participate in the supporting activity of specialized product. They try to find any local specialized products in the locality from cooking viewpoint.</p>

6-5-3 Provision of Agribusiness Information and Communication System

Verification	<p>This project is to provide market information of agricultural products so that agribusiness stakeholders such as private processors, farmers groups/ women groups, middlemen, traders, retailers and administrators can get at required time and operate their agribusiness. It is designed that DNPIAC collects necessary market information from the district market, compiles them as database and send to the stakeholders. There is no effective agribusiness information and communication system so that agribusiness stakeholder can make use for their business.</p> <p>General information about commodity price levels is of only limited use. However, the pilot project verified that better integration of recipes with harvest times for agricultural products could be of significant benefit for caterers and small restaurants. Since the pilot project was based on the concept of local product, local consumption, all major food materials are purchased at domestic marketplaces. Cold storage facilities do not exist in the local marketplaces and transported one from outside local areas becomes prohibitive. As a result, caterers and small restaurants are nearly totally dependent for their food supplies on the local marketplaces. They can get market information by direct contact to the marketplaces, not from communication with database.</p>
Lessons Learned	<p>Food materials for cooking class, catering service and restaurant, are purchased from local marketplace by means of direct contact with sellers, calculating the expenses and profit.</p>
Feedback	<p>Significance to provide market information system covering whole country is low for small caterer and restaurant who directly purchase food materials from local marketplace.</p>

6-5-4 Support for Marketing Route Development

Verification	<p>This project is to support sales promotion of local agricultural crops and product. In the Draft Action Plan, MAF should develop comprehensive sales promotion strategy such as agribusiness fairs, use of market booths (antennae shop), promotion 'Local product-Local consumption' campaign and use of media such as radio and newspaper.</p> <p>The cooking class project verified that the methods used to recruit cooking class participants were very successful.</p> <p>As for recruitment of cooking class instructor, DNPIAC called to related women through their using women group network. Both cooking class NGOs recruited the participants by; (i) targeted telephoning campaigns to reach those considered interested in the classes; (ii) announcements in existing classes; (iii) church announcements; and (iv) radio broadcasts. Students taking classes were asked to mention the upcoming classes to their parents. Recruitment efforts were very successful. In all cases, the NGOs were able to attract sufficient numbers to make the classes viable.</p>
Lessons Learned	<p><u>There is a strong demand for continuation of the basic cooking classes at both existing venues and in additional locations. The participant recruitment techniques used in the pilot project were very successful and can be employed in future recruitment efforts. Recruitment efforts could be enhanced by offering a new class directed at increasing culinary skills.</u></p> <p>There remains a strong demand for the cooking classes. More classes, using the skills and information developed under the pilot project, can be offered in existing areas. Both NGOs are very eager to continue offering cooking classes. The cookbook produced under the pilot project can continue to be used for new classes.</p>
Feedback	<p>DNPIAC should continue the cooking classes in both in existing and new locales. There exists sufficient demand and ready materials. The NGO's techniques to recruit participants should continue to be used. However, it is proposed the existing techniques be supplemented with the use of posters, banners and flyers.</p> <p>A new cooking class, "Cooking for Income" providing some new recipes and teaching basic business skills should be applied.</p>

CHAPTER 7 LESSONS LEARNED FROM THE PILOT PROJECT IMPLEMENTATION ORGANIZATION

Each project of the Draft Action Plan was verified through the pilot project implementation. Although some parts of the Draft Action Plans should be modified and added based on the verification results, effectiveness of the Draft Action Plan was considered to be high. Lessons revealed in the pilot projects implementation processes would be reflected into the each activity plan of the Action Plan. In addition, through the pilot projects implementation, following lessons were also learned from the evaluation process of the implementation organization. Obtained lessons are put on the implementation organization plan of the Action Plan.

7-1 NECESSITY OF STRENGTHENING DISEMINATION SYSTEM OF CROPPING TECHNOLOGY

In order to promote processing/ marketing industry in the country where such self-sufficient agricultural style is prevailing and marketing amount is limited, it is crucial for agribusiness actors such as processors and traders to deal in produced crops in quantity and quality stably as raw materials for their processing/ trading activities. However, in the pilot projects, it was difficult for them to procure necessary raw materials. For example, soybean for the pilot project "Value Chain Improvement for Soybean Products" and corn for the "Promotion of Small Scale Business of Poultry Raising by Women's Group" have had poor production in the last year, which have a bad influence on the pilot project implementation process. As for soybean, its production was damaged by diseases and harmful insects due to flooding. As the result, soybean price was jumped. It caused the negative impact on the promotion of contract farming and procurement of the seed. Shortage of the corn caused to jump its purchase price. It caused the shortage of feed for chicken raising, and manufacturing the corn bread was interrupted in the local bakeries. In order to establish value chain system, it is crucial to strengthen cropping technology including multiplication of its seed, aiming to make marketing of raw materials of target product stable.

7-2 NECESSITY OF CAPACITY DEVELOPMENT OF DNPIAC FOR COOPERATION WITH RELATED MINISTRIES AND MAF DIRECTORATES

Pilot projects were implemented to provide stakeholders the training opportunities so that they tried to work in coordination. DNPIAC acted as the implementation body and practiced to make arrangements with related organizations such as DNAH, DNADC, DNIGUA and DNPV. Pilot projects were implemented in cooperation with such organizations. In the pilot project "Capacity Development of Agricultural Cooperatives", cooperation activity with MED and district DNIGUA was practiced in the group training and rehabilitation of the irrigation facilities. Cooperation work in the "Value Chain Improvement of Soybean" was to find seed multiplication farmers and disseminate organic farming. In the chicken raising activity, cooperation with district DNPV was practiced in taking disease prevention measure. Those cooperation activities were sporadically executed. Through the cooperation works in the pilot project implementation, DNPIAC's roles and functions were verified. The verification work was judged from progress of the coordination work with those organizations such as the participation in the pilot projects. From the results, it was found that DNPIAC participated in the initial stages, but

its frequency was decreased in the later stage. It was not considered that cooperation was fully conducted. It seems that there are constraints. It is considered that there are the subjects such as budget limitation and organizational/ institutional constraints in both DNPIAC and related organizations. Besides such constraints, it is pointed out that there is a lack of coordination and communication capacity of DNPIAC staff. It is necessary to improve organization capacity of DNPIAC and related organizations. Especially, in order to realize cooperation among related organizations, it is required to train the DNPIAC staff so that they can work as implementation body. It is required to make their function strengthen.

Government products purchasing system operating by MTCI affects an influence on the not only processing/ marketing fields but also production activity. In the pilot project, the system affected on the selling activity of milled rice by cooperative and procurement of corn as chicken feed, raw materials of corn bread and soybean for soymilk. It seemed that economic activities along value chain were affected by the system. The system has an aspect to obstruct private sector's economic activity in the value chain system. MAF should suggest improvement ideas based on such negative influence to MTCI.

7-3 NECESSITY OF TECHNICAL SUPPORT FROM RELEVANT PRIVATE ORGANIZATIONS AND GROUPS

Basic role of the administration is to support agribusiness activities brought from private actors. In the pilot project, however, participated actors such as farmers and women groups could not get enough supports from administration offices. Especially in the activities such as soybean production and chicken raising, there were the situations so that it became difficult to build mutual reliable relationship between actors and district office. Improving executing capability of administrator in district office would be indispensable for realization of Action Plan. However, it will take long time to build their capacity so that they can support fully related actors.

Under such conditions, for the pilot project, NGOs and relevant private organizations/ groups were incorporated into the implementation organization as technical supporters to the actors. It was evaluated to be effective to make use of them, although their supporting activities were properly managed under the technical and financial supports by the study team. NGO participated in the pilot project learned new technology/ skill and accumulated knowledge in collaboration work with the study team. For example, local NGO who participated in the promotion of contract farming in the pilot "Value Chain Improvement for Soybean Products" has learned organic farming technology in the activity process. The NGO could build the capacity so that they could transfer the learned technology to related farmers. As the result, the NGO worked as an interface between soybean production farmer groups and soybean processor. In addition, they could teach the tempe manufacturing technology learned from the pilot project to other farmers/ women groups of the other rural area in cooperation with other NGO.

Judging from the performance in the pilot project, it seems that such NGOs who have obtained new knowledge and skill/ technology from the pilot projects will be able to act as a facilitator or learning center under an appropriate management and financial support, for future implementation of the Action Plan and similar technology transfer.

CHAPTER 8 CONCLUSION AND RECOMMENDATION

8-1 CONCLUSION

Five pilot projects were implemented based on the basic concept of value chain improvement considering contribution to development goal such as ensuring food security and shifting to market oriented agriculture. Agribusiness activities having target crops, rice and corn as staple crop, cassava of root crops and soybean, were practiced under the integrated approach from production, processing, marketing and selling. Business model generating in the practice aiming to improve the value chain was verified.

Pilot Project	Verified Business Model and Targeted Crops
Capacity Development of Agricultural Cooperatives	Business model through value adding in the processes of production, post-harvest and processing of rice and vegetables
Value Chain Improvement of Soybean	Soybean business generating in the value chain improvement of soybean in seed procurement, production, manufacturing products and selling.
Promotion of Small Scale Business of Poultry Production by Women's Group	Chicken and egg production and selling business through strengthening chicken raising activity and use of corn as feed compound.
Diversification of Corn Product	Corn product processing and selling business generating in the value chain improvement by making use of corn flour.
Support on 'Local Product, Local Consumption'- Cooking Classes	Demand expansion of major crops such as cassava, corn, potato and vegetables through dissemination of cooking method.

Pilot projects were evaluated based on the five evaluation items. As the results of the evaluation, business model of the project was judged to be effective, although the evaluation has different level.

Pilot Project	Validity	Effective-ness	Efficien-cy	Impact	Sustaina-bility	Total	B/C
Capacity Development of Agricultural Cooperatives							1.2
- Rehabilitation of the Irrigation System	4	3	3	3	2	15	
- Improvement of Cropping and Marketing Technology	4	4	2	2	3	15	
- Technical Training for Strengthening Operation and Management	4	4	3	3	2	16	
Value Chain Improvement of Soybean							1.1
- Value-Chain Improvement for Soybean Products (Wide Marketing Area)	4	4	3	4	3	18	
- Value-Chain Improvement for Soybean Products (Local Small Marketing Area)	4	4	4	3	3	19	
Promotion of Small Scale Business of Poultry Production by Women's Group	4	3	2	3	3	15	0.8
Diversification of Corn Product	3	4	3	3	3	16	1.2
Support on 'Local Product, Local Consumption'- Cooking Classes	3	4	5	3	4	19	1.0

8-2 RECOMMENDATION

8-2-1 Suggestion to the Action Plan

Projects of the Draft Action Plan were verified through the pilot project implementation. As the results, Planned activity in the project was verified to be effective, although it was necessary to be modified and added in some activities. Modified and added subjects should be put on the each project of the action plan. Lessons learned from the pilot project implementation and suggestions to the action plan are compiled as follows.

(1) Suggestion from the Pilot Project "Capacity Development of Agricultural Cooperatives"

Project	Lessons learned	Suggestion
Rehabilitation of Agricultural Production Infrastructures	Considering the topographic condition in Timor-Leste, rehabilitation of gravity irrigation system should be prioritized. But, it is unavoidable for farm lands where have no suitable streams in/ around that areas to introduce diesel engine pump with well. It is proposed to standardize the all stages from survey, planning and designing to construction works so as to make rehabilitation works smooth.	Development stages from survey and planning to construction works should be standardized to make rehabilitation works smooth. For proceeding pump rehabilitation, prior to the planning stage, it should be taken action to make consensus of the type of pump and its operation/ maintenance method.
Strengthening of Dissemination System of Cropping Technology	In order to strengthen natural farming methods (local resources adapted farming method), inputs of organic fertilizer and organic pesticide are effective for improving crop growing.	Organic farming (local resources adapted farming) technology including the ways how to make organic fertilizer and organic pesticide and how to spray them should be disseminated as one of the cropping technologies.
Support for Set-up of Processing Industries by Farmers/Women's Groups	It is not easy for cooperative members to make consensus for organizing cooperative activity, especially, in case of new challenging activity with expenses. Long term period is required in order to strengthen the cooperative's capacity	MED monitors regularly the current situations of the registered cooperatives and takes necessary supports based on the monitoring results. MED supply new technical information about new activity and provides learning opportunity among similar cooperatives and groups.
Support for Improvement of Product Transportation	It is necessary for agribusiness targeted products to provide basic material and measures of packaging. It is necessary to collect information on transporters and supply to agribusiness stakeholders.	Basic packaging material and packaging measures should be selected. Information about the procurement of the packaging material and the packaging measures should be collected and compiled for propagation to the related agribusiness groups. MAF should collect information on transporters in sub-district level and compile them. The information shall be provided to users through district and sub-district offices.

Project	Lessons learned	Suggestion
Introduction of Agriculture Produce Grading System	The introduction of required labeling of rice grade for all domestic rice sales would make rice market active, and benefit local farmers, traders, retailer and consumers.	For activating rice market, grading system should be provided. Content of broken rice and impurities should be the major standard items in the grading system.
Capacity Development Plan of Agribusiness Stakeholders	Group training participated from private groups and government was effective to build their capacity and make human resources network among private and government agribusiness persons.	DNPIAC undertake to have group training regularly for related persons with agribusiness in cooperation with MED and MAF. The training aims to develop their agribusiness capacity.

(2) Suggestion from the Pilot Project "Value Chain Improvement for Soybean Products"

Project	Lessons learned	Suggestion
Establishment of Seed/Input Materials Supply System	Seed is procured by agribusiness target crops, As for soybean seed, Maubisse produced seed can be distributed to production farmers.	Natural land condition and cropping methods should be surveyed to find seed multiplication areas and farmers, in the case that seed of the target crop can not be procured from the present seed supply system. As for soybean seed, Maubisse is the most suitable area.
Strengthening of Dissemination System of Cropping Technology	In order to strengthen natural farming methods, application of organic fertilizer and organic pesticide are effective for crop growing.	DNPIAC as the mediator between related farmers and district extension workers, work out to disseminate organic farming technology including making organic fertilizer/ organic pesticide and spraying them. In the sites, it is effective to make use of NGO who learned know-how in this project.
Promotion of Contract Farming	Contract farming should proceed flexibly taking into consideration the farmers' contract sense. Supporting activity aiming to improve cropping technology should be given to farmers groups, in order to make farm production stable.	For contracting, an agreement should be made in the presence of DNPIAC staff and processors/ traders, and other private groups/ NGO agreed by related persons. It is required to collaborate with the project "Strengthening of Dissemination System of Cropping Technology", in order to ensure production activity,
Support for Set-up of Private Processing Industry	Financial support might be necessary for private sector in procurement of machine and/or equipment to make processing and marketing business easy.	MAF, in cooperation with MTCI and MED, should work on to the related organization to establish credit system and/ or subsidy system so that private sector can procure processing and marketing machine and equipment. For

Project	Lessons learned	Suggestion
		making financial support accessible, MAF should arrange with international aid agencies and related private sectors as required.
Support for Set-up of Processing Industries by Farmers/Women's Groups	Tempe manufacturing skill is the women's group adapted technology by using local materials.	DNPIAC should transfer tempe manufacturing technology to women groups where soybean production is active and contract farming is introduced. It is effective to make use of NGO who learned the technology as trainer.
Support for Marketing Route Development	Sales promotion strategy should be provided from the viewpoints of consumers' five mental aspect, Attention, Interest, Desire, Action and Satisfaction.	Government should undertake exhibition or agribusiness fairs regularly, in order to promote sales of domestic agricultural crops, local made products and new products by using local products developed by private sector. This contribute to the 'Local products-Local consumption' campaign
Introduction of Agriculture Produce Grading System	The protein content of local soybeans at nearly 50% is a very favorable finding for soybean processors.	Local soybean product producers and traders can use tested information such as high protein content and requirement further cleaning for promotion of their business.
Capacity Development Plan of Agribusiness Stakeholders	It is an urgent matter for district extension workers to improve their cropping technology and promotion capacity. On the other hand, it can be possible to make use of NGOs who learned know-how in the pilot project for promotion of the cropping technology.	MAF should provide training program for extension farmers to promote organic farming. On the other hand, NGOs and related private organizations/ groups who learned technology and knowledge can be incorporated as technical supporting group into the implementation organization of the Action Plan, to support extension workers,

(3) Suggestion from the Pilot Project "Promotion of Small Scale Business of Poultry Raising by Women's Group"

Project	Lessons learned	Suggestion
Support for Set-up of Processing Industries by Farmers/Women's Groups	Chicken raising activity may be accessible for women's groups in local area. since they can set up with low capital investment. It is hard to expand the raising activity because of unexpected disease occurrence risk.	Chicken raising is incorporated into the Action Plan as a realistic agribusiness activity in rural areas. Chicken raising business is put stress on the growing local chicken rather than the chicken egg purpose raising. It can be led by

Project	Lessons learned	Suggestion
	Considering such risk, it is realistic for women groups to put chicken growing business rather than chicken egg business, through strengthening traditional raising method by using local feed materials.	strengthening traditional raising way.
Support for Provision of Processing Infrastructures	The power source of the processing machinery and equipment was designed based on operation and maintenance method including bearing the running cost.	Power source of the processing machinery and equipment should be planned based on the local conditions and operation/ management capacity of targeted processor/ women's groups/ farmers groups. Providing that they could not purchase power supply equipment, government should establish financial supporting system such as subsidy system and a long term loan system for them.
Provision of Agribusiness Information and Communication System	In case of small scale sales chicken business by women groups, it is easy to send to the market through middleman. Necessity of data base preparation covering market information widely.	Small scale chicken raising women groups collect local market information through middleman and/or related persons for their sales activity. Market information is communicated by simple method like SMS.
Support for Marketing Route Development	Chicken raising activity is limited to the small scale avoiding risk of the disease. Besides the sales through local middleman, it can be realistic to develop other market route like local restaurant	Under the current activities avoiding the risk of disease and lack of feed, chicken raising is limited to the small scale activity in household level aiming to generate non-farm income source.
Capacity Development Plan of Agribusiness Stakeholders	It is urgently required for district DNPV staff to improve their knowledge and technology to disease prevention.	DNPV should provide for district staff training opportunity to learn disease prevention measure. For promotion of chicken raising in household level, it can be effective to make use of NGO who has technology and experience.

(4) Suggestion from the Pilot Project "Diversification of Corn Product"

Project	Lessons learned	Suggestion
Support for Set-up of Private Processing Industry	Target crop as raw material for processing industry should be produced stably in quantity, quality and price. To meet with this, it is required to be the crop cultivated and marketed widely in the country. It is important to find	DNPIAC prepare the list of possible products/ commodities to be improved and developed. The list includes the name and capacity of existing processors/ processing groups. The list is useful to plan future processing project.

Project	Lessons learned	Suggestion
	highly-motivated processors so as to encourage them to improve and develop commodity positively.	
Provision of Agribusiness Information and Communication system	Imported wheat flour is available throughout the country at a fairly consistent average price. Corn flour is not readily available anywhere in the country and sells presently at a prohibitively high price except in Maliana. Corn and/or corn flour can be transported from Maliana to Dili at a reasonable cost but not to other areas. Provision of agribusiness market information or communication systems is of only limited usefulness as long as MTCI is setting prices for all major commodities.	Corn flour is can only be obtained in Maliana at an economically viable price. Dili bakery operations secure financially viable supply contracts with corn flour makers in Maliana. As long as the MTCI commodity purchase price scheme is in place introduction of an agribusiness information and communication program is not warranted.
Support for Marketing Route Development	Radio was the most effective media channel followed in order of effectiveness by newspapers, banners, flyers and posters.	Radio, newspapers, banners and flyers are all good media channels for new product promotion. Posters were found to be of limited usefulness.

(5) Suggestion from the Pilot Project " Support for 'Local Product, Local Consumption' – Cooking Classes –"

Project	Lessons learned	Suggestion
Support for Set-up of Processing Industries by Farmers/Women's Groups	Cooking class might bring graduates to grow an awareness of cooking business.	DNPIAC lead to open the cooking class in all district. MAF, in cooperation with the related ministries, should work to establish subsidy system to support set-up of cooking business.
Support for Specialized Products	Knowledge and cooking skills learned in the cooking classes would be helpful for finding products to be specialized in the locality and its commercializing process.	Cooking class graduates are encouraged to participate in finding specialized products.
Provision of Agribusiness Information and Communication System	Food materials for cooking class, catering service and restaurant, are purchased from local marketplace by means of direct contact with sellers, calculating the expenses and profit.	Significance to provide market information system covering whole country is low for small caterer and restaurant since they directly purchase food materials from local marketplace.
Support for Marketing Route Development	There is a strong demand for continuation of the basic cooking classes at both existing venues and in additional locations. The participant	DNPIAC should continue the cooking classes in both in existing and new locales. A new cooking class providing some new recipes and teaching basic

	recruitment techniques used in the pilot project were very successful and can be employed in future recruitment efforts.	business skills should be applied.
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8-2-2 Suggestion to the Framework of Master Plan and Implementation Organization of the Action Plan

(1) Suggestion to the Framework of Master Plan

1) Incorporation of the Program "Value Chain Improvement"

Basic role of the DNPIAC is to organize an effective cooperation relationship with related organizations and private sectors for establishing value chain as a core of agribusiness target crop. DNPIAC observed through the pilot project "Value Chain Improvement of Soybean" that it enabled to establish the value chain of soybean from seed procurement to production, processing, marketing and consumption. However, it was not considered that DNPIAC staff understood and executed their responsibility which is to establish value chain based on the integrated approach from production to consumption. It was verified that further capacity development of DNPIAC organization and related private stakeholders was required in order to establish and strengthen a value chain system.

Under such lessons learned, it is suggested that the program "Value Chain Improvement" incorporates into the framework of the Master Plan, to realize agribusiness of the Action Plan. Suggested program should provide the functions to support establishment of product based value chain and guide human resources development of value chain stakeholders.

(2) Suggestion to the Implementation Organization

1) It is required to organize the implementation organization so as to enable to cooperate with related ministries and related MAF directorates.

It was obtained that it was required to provide cooperation with related administration organizations and strengthen communication and cooperation capacity of DNPIAC. Judging from the progress of the cooperation works led in the pilot project, it is not considered to be easy that DNPIAC, as only one of the MAF directorate, guides all of the cooperation work. In order to realize the Action Plan, it is required to organize an implementation organization which can provide cooperative relationship with related ministries and directorates.

2) It is effective to incorporate relevant NGOs and private organizations/ groups into the implementation organization of the Action Plan, under the management and financial supports from the international aid agencies, until MAF provide budgeting and institutional conditions for realization of Action Plan.

It was learned that NGOs and private organizations/ groups who participated in the pilot projects and have experiences and knowledge might act as technical supporters to actors in the future implementation of Action Plan, provided that financial support and task management would be conducted properly.

On the other hand, it was learned that it was necessary for making cooperation work functional to strengthen execution capacity of the related organizations and grapple with institutional improvement. It is not easy to provide such conditions for organizing implementation organization in short term. In addition, budget limitation of related organizations is assumed. Considering these situations, it is

suggested to make full use of NGOs and relevant private organizations/ groups for implementation of the Draft Action Plan. Such NGOs and private organizations/ groups are incorporated into implementation organizations of the Action Plan as technical supporters. Their supporting activities will be managed and supported financially by International Aid Agencies like the pilot projects. This implementation method is the temporary step until institutional improvement including budgeting, will be completed.

3) It is realizable to take product based approach for materializing Action Plan

Planning agribusiness development scheme is much dependent on the target product. In the pilot projects, target products were primarily selected and action plan was prepared based on the selected target products. Considering such pilot projects, it is considered to be realizable for DNPIAC and related organizations to take product based approach. Product based approach is proposed to realize the Action Plan, like the pilot projects. To do so, target product is selected and action plan is prepared based on the selected target product. For selecting target product, development potential should be studied. Necessary supports should be formulated based on the development potential, which are incorporated into the Action Plan of the Master Plan.