Cost Comparison among Irrigation Technologies:

Cost comparison among the irrigation technologies was made based on the water requirements derived from the experiment. The costs of each irrigation technology were calculated on the water prices and the equipment costs which varied with the irrigation technologies.

The water prices set by São Domingos County were used, namely 25 ECV/m^3 and 15 ECV/m^3 for the traditional irrigation and the water saving irrigation respectively. For the water saving irrigation, the price was set low for its promotion with the government subsidy.

The drip irrigation equipment which was durable for 3 years cost 500,000 ECV/ha. One pot for pitcher irrigation cost 500 ECV and its total cost came to 1,500,000 ECV, as 3,000 pots/ha were needed. The pots were durable for 3 years as well. The result of the calculation are shown in the following table.

Table 6.8.3 Costs of Each Irrigation Technology

(per ha)

Irrigation System		Water Requirements		Water Price (ECV)		Equipment Cost (ECV)	Water Price & Equip. Cost	
		day	270 days/year	m^3	year		3 years (ECV)	year (ECV)
Traditional	without mulch	55 m^3/day	14,850 m^3/year	25	371,250	-	1,113,750	371,250
Drip	without mulch	32 m^3/day	8,640 m^3/year	15	129,600	500,000	888,800	296,267
Drip	with mulch	26 m^3/day	7,020 m^3/year	15	105,300	500,000	815,900	271,967
Pitcher	without mulch	35 m^3/day	9,450 m^3/year	15	141,750	1,500,000	1,925,250	641,750
Pitcher	with mulch	30 m^3/day	8,100 m^3/year	15	121,500	1,500,000	1,864,500	621,500

As a result, the annual total costs of the water price and equipment cost of each irrigation technology are as follows;

Traditional Irrigation without mulch:	371,250 ECV
Drip Irrigation without mulch:	296,267 ECV
Drip Irrigation with mulch:	271,967 ECV
Pitcher Irrigation without mulch:	641,750 ECV
Pitcher Irrigation with mulch:	621,500 ECV

The costs of drip irrigation with mulch were the cheapest, and the difference from those of traditional irrigation came to 99,283 ECV. It means about 27% of cost saving was realized by the drip irrigation.

Concerning the pitcher irrigation, since fabrication of the pots were specially ordered for the experiment and its equipment cost became high, the calculation resulted in its costs became nearly twice as much as those of traditional irrigation. However, it might be possible to reduce fabrication cost of the pots through mass production. Therefore, it is needed to study the fabrication cost of the pots in the course of the continuous management of the experimental farm. Given that their fabrication cost becomes reduced to 250 ECV/pot, which is half of the original price, the costs of pitcher irrigation become nearly the same as those of traditional irrigation. This cost reduction will bring about the enlargement of irrigation farm with the same cost of the current cost, taking the benefit of excess water by water saving.

Value of pF in the Soil:

The study team estimated the value of pH in the soil of the field for drip irrigation (A1: Green pepper A2: Tomato) and of the field for traditional irrigation (furrow irrigation) for one month, the period between the 7th of September and the 12th of October. The axis line indicates the date of transplanting of each cropping (24th of August 2009). Six arrows point to the date of rainfall. It should be noted that precipitation data in the district of S. Francisco in ZAE I, located in the 7 km south of Achada Baleia were cross-referenced, since the weather observatories do not exist here. Volume of precipitation was 41 mm/day after the 15th day of transplanting, and 7.5, 26.0, 25.0, 13.0, 5.5, and 50 mm/day respectively after that.

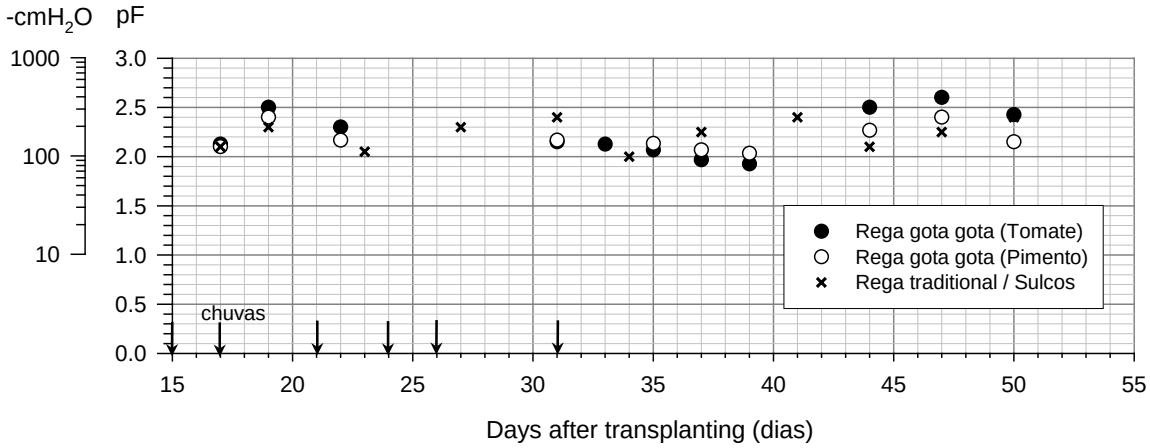


Figure 6.8.2 Shift of Values of pF for Drip Irrigation and Traditional Irrigation

Water Saving Irrigation Manual:

The study team brought the activities on the water saving irrigation experimental farm together into the manual in cooperation with the functionaries of DGASP.

6.8.3 Evaluation

(1) Verification of the Outcome (Performance)

- Training was organized for the purpose of learning appropriate maintenance for the water resources targeted at the functionaries of DGASP, agricultural local officers in São Domingos, and farmers who are practicing traditional irrigation.
- Facilities for experimental farms for water saving irrigation pre-installing devices, such as drip and pitcher irrigation, have been constructed.
- Experimental cultivation started sequentially, by the initiative of extension officers under the instruction of functionaries of DGASP, with cooperation of farmers.
- Functionaries of DGASP/agricultural local officers in São Domingos learned use of the measurement equipment necessary for assessment, and methodology for data collection.
- The study team elaborated manual in cooperation with the functionaries of DGASP, reflecting the activities on the experimental farm for water saving irrigation.

(2) Verification of Implementation Processes

- This kind of training was the first trial in CV, and participants seriously audited the lecture.
- On the selection of the experimental water saving irrigation farm, the fields cultivated by the farmers does not meet the required areas for experiment as they were too small, and the study team had difficulty in securing the large farms. Also, the irrigation water was supplied by portion currently allocated to each of the farmers, since the water resources were exclusively from wells, and the volume of irrigation water was limited.
- Amidst all those constraints, one of the farmers offered to provide the currently uncultivated lands (0.2 ha). In addition to this, he offered the allocated well water for irrigation use. The study team decided to employ this field.
- Fabrication of the pots for pitcher irrigation was behind the schedule, due to the weather constraints which made drying difficult and power cut which blocked the burning of pots by electric oven.
- The weather observation was not carried out at the initial phase of the study due to the delay in the delivery of the equipment.
- Farmers who were engaged in cultivation in the experimental farm employed the methods employed in the experimental farm to his own agricultural practice.

(3) Evaluation Result by Five Evaluation Criteria

The evaluation result of this component by five evaluation criteria is as follows:

Relevance

- This component of the Action Plan enables accumulation of techniques on the water saving irrigation and its dissemination, which leads to the efficient utilization of water resources at the national level.
- This project is viable, since PEDA, which is the superior plan, stresses the promotion of water saving irrigation, farmers are able to extend the arable fields with its introduction and the project meets the needs of the farmers.
- The outcome of the pre-training questionnaires revealed that most of the well experienced irrigation engineers have never been received such kinds of trainings before. Also, they satisfactorily evaluated that the training improved their knowledge. It is considered to be relevant for the implementation of the project.
- The demand on water saving irrigation experiment is considered to be big, since DGASP shows his will to continue the experiment after the Study.

Effectiveness

- This project component can make benefit for the farmers, as the implementation of this component can reduce the amount of irrigation water and enables the expansion of the cultivation.
- The training provided the trainees with good opportunities to become interested in the water saving irrigation and salt damage.

- This project can be efficient in that the data on the water saving irrigation, which did not exist in CV before, became accrued through the process of the study.

Efficiency

- As for the implementation, delivery of the pots for pitcher irrigation was behind the schedule, since they were produced in the rainy season which caused the delay in drying them and the operation holding of electric kilns due to power cut.
- The study team could not conduct metrological observation in the first phase, because of the late delivery of the meteorological measuring instruments.
- It is difficult to discuss the efficiency of the project in terms of the outcome of input, since this is the experimental project and the farmers cannot benefit from it. However, it can be said efficient, taking it into consideration that the farmers are going to increase in the benefit with the introduction of the result of the experiment.

Impact

- Positive impact could be recognized from the fact that the trainees were willing to take trainings on fertilization of the soil, and disease and insect control, as well as the methods for water saving irrigation and salt damage as future lectures.
- Farmers who were engaged in the cultivation in the experimental farms started to employ the methods of cropping which was utilized in the training to his own farm.

Sustainability

- CV is highly expecting to implement this project, as it has not experienced water saving irrigation before. Since the experiment shows the possibility of the reasonable use of water, and DGASP demonstrates its view to continue the experiment of water saving irrigation in future, the project can be said sustainable.

6.8.4 Conclusion

Confirmation of Hypothesis

Hypothesis: Extension officers would receive the training on the management of water saving irrigation, collect its basic data through the water saving irrigation experiment, and finally become to tackle the implementation of the experiment in future with the functionaries of DGASP.

The training was organized for the purpose of appropriate management of the water resources within the framework of the current conditions in the irrigation area, targeting at the functionaries of DGASP, agricultural local officers in São Domingos, and the farmers within five days (24th to 28th of November 2008). The outcome of the questionnaires after the training confirmed that the awareness of the water saving irrigation had erupted, despite that it could not gauge to what extent their capacity was improved.

In the middle of August, 2009, the experimental cultivation started with the initiative of the extension officers who had received the water saving irrigation training with the assistance of the

functionaries of DGASP and with the cooperation of the farmers. The nursery preparation started at the beginning, and setting of the flow meters and pF meters started in September. Then, the study team assisted them to learn how to read meter and record the data, and the farmers recorded the values of the meters and the extension officers aggregate them. This hypothesis is considered to be verified, since DGASP announces to continue to implement the experimental assessment of the water saving irrigation farm.

Conclusion

Cape Verde has never experienced water saving irrigation experiment, which indicates the poor accumulation of data on the water saving irrigation at present. Implementation of water saving irrigation experiment could lead the possibility of the reasonable use of water: hence, collection of data which has not been accumulated enables the promotion of water saving irrigation mentioned in the superior plan. Good use of the data will realize the farmers to implement the water saving irrigation, and it can improve their livelihood. Actually, the experiment proved the effectiveness of the introduction of water saving irrigation. Concerning the drip irrigation, it was confirmed that this irrigation system can save not only water but also cost.

Concerning the pitcher irrigation, it was confirmed that this irrigation system is more expensive even than the traditional irrigation. However, if the costs of pitcher irrigation can be decreased to the costs of the traditional irrigation, it will be possible to enlarge irrigation farm with the same costs so far with the benefit of excess water derived from water saving effectiveness. Additionally, since the pitcher irrigation method is more simple than that of the drip irrigation, and its equipment is possibly procured locally without importing, such advantage makes this method adaptable for the farmers who newly introduce the saving irrigation. Therefore, it is significant to examine the possibility of its future introduction. And it is recommended to continuously examine its feasibility, by its cost reduction and preparation of implementation manual, through the water saving irrigation experiment.

Concerning the water saving irrigation training, this kind of training has never been implemented in CV. Well experienced engineers have never taken such trainings before. This training, which aims to increase the number of functionaries who have knowledge on the water resources management, is indispensable, not only for the promotion of water saving irrigation assessment, but also for the promotion of water saving irrigation to farmers.

Therefore, this project is considered to be a high-priority action program. In this study, not only project for introduction of water-saving irrigation, but also that for water-saving training is implemented. Hence, the study team shall integrate both projects into one project for promotion of water-saving irrigation composed of the following contents; introduction of water-saving irrigation; development of experimental farm; and training for the implementation of water-saving irrigation.

6.8.5 Lessons Learned and Reflection of Action Plan

Table 6.8.4 Lessons Learned and Reflection to Action Plan: Water Saving Irrigation/Water Management

Lessons Learned from Pilot Project Implementation	Reflection to Action Plan
• Fabrication of pots needs to be ordered during the dry season.	→ Include the concerned item in the Action Plan.
• Data collection by extension officers during the absence of the study team has not been properly conducted.	→ Strengthening of the water saving irrigation might be required.
• As a result of the training, trainees are expecting to participate in the lecture on the fertilization of the soil and disease and insect control.	→ Include this component in the training of the extension officers.

6.9 Process and Evaluation of Project Component: Forage Cultivation with Forest Conservation

6.9.1 Profile and Objectives

In ZAE IV, numerous forests, including national parks exist, where forestation was attempted in the past. Currently, local order regulates that surrounding communities be responsible for managing forest. In reality, the communities have not properly managed it, and weeds and brushes have not been trimmed. The project attempts both to conserve the forests and to secure the pasture grass for hay by means of cleaning them, sawing the pastoral grass and cultivating the pastoral land.

Rui Vaz, which is the target area of the pilot project, has limited agricultural land with little ground water, due to the steep landscape in the ridged lines. Also, it is very difficult to expand agriculture with forests adjoining to their farms. It makes the most of male workforces working in abroad and supporting their household lives by remittance. It is said that surrounding communities are responsible for the forest management; however, in reality, rural residents does not trim natural forests, and the strong tree species called Espinho cachupa (Academic name: *Dichrostachys cinerea*) are covering the lower part of forest. Moreover, since it is legally prohibited to cultivate food crops and fruit trees and to cut down tress for firewood in the preserved forests, the community residents cannot have the motivation to manage the preserved forests. For this reason, the Espinho cachupa, which is harmful to the blue gums, shall be ridded in order to realize both the restoration of forests and the production of forages with several annual crops.

It is worthwhile noting that, since the dry season is rather long, there would be no need to worry about other plants growing, if varieties, numbers density for sawing and period of cultivation of pasture grass are properly managed. Hence sawing from the next year might not be required.

In another aspect of this Pilot Project, EU donated 37 goats to ACB in Rui Vaz, and facilities for goat cheese production are under construction. However, since this area does not have the plenty of fodder to feed the livestock animals, the goats are entrusted to the other lower areas.

6.9.2 Activities

This project was implemented in 2.7 ha of Curralinho protected forest (145 ha in total) which is

located in Rui Vaz, only one ACB located in ZAE IV in São Domingos Watershed. The achievement of activities is shown below.

Table 6.9.1 Activities: Forage Cultivation with Forest Conservation

Activities	Expected Result	Schedule	Responsive officers	Input
		2008 (o n d) 2009 (j f m a m j j a s o n d) 2010 (j f m A)		
1-1Selection of the target place and survey	Decision of the place		ACB	ACB
1-2 Elaboration of implementation plan in cooperated with the extension officers and ACB members under the instruction of external advisers	Elaboration of realistic implementation plan		Counterparts External Advisers	CV: Functionaries and ACB JICA: Members of the study team and external advisers, cost for the training
1-3 Cleaning of weeds, sawing seeds of pastoral grass and cultivation			ACB	ACB
1-4Organization of evaluation workshops for extension officers of agricultural local office and ACB	Sharing of the recognition for reflection		Counterparts, Group of Farmers	CV: Functionaries and ACB JICA: Members of the study team, external advisers
1-5 Organization of seminars to the extension officers in agricultural local office and ACB for the purpose of the disseminating the outcome for farmers in other areas.	Awareness of the farmers in other areas of ZAE IV for the importance of this project		Counterparts Group of Farmers	CV: Functionaries and ACB JICA: Members of the study team, external advisers

As a precondition for implementing this project, the study team urged the ACB of Rui Vaz to have seeds of the pasture grass. However, the ACB hesitated to collect seeds necessary for the project and did not started it. ACB finally started to produce seeds after several prods of intermittence of the project. After that, ACB cleaned weeds in 2.7 ha of target area and conducted pruning of the branches, and sawed five varieties of pasture grass, waiting for the rainy season. It cost ECV712,000 and ECV37,500 for cleaning and seeding respectively. The varieties of pasture grass are described below:

Table 6.9.2 Varieties of Pasture Grass

Family / Generic name	Academic name	Local name	Seeds (liter)
Poaceae / Panicum	*Panicum maximum*	Dje Dje	150
Paceae / Setaria	*Setaria verticillata*	Pega saia	10
Amaranthaceae / Aerva	*Aerva javanica*	Florinha	30
Favaceae / Desmodium	*Desmodium tortuosum*	Crioula	20
Poaceae / Pennisetum	*Pennisetum polystachion*	Balanco	30

In August 27, 2008, 12 members assembled to organize workshop for the purpose of setting the objectives of this Pilot Project. The objectives defined by the members are shown below:

1) Job creation;
2) Combat against the soil erosion;

3) Increase in the volume of ground water;
4) Maintenance of protected forests;
5) Publication of high quality seeds of pasture grass;
6) Production of high quality pasturage;
7) Improvement of the level of livelihood.

Each of pasture grass, after the disseminating the seeds, basically grew at a good pace with abundant rainfall. However, illegal cultivation of steeling the grass started observed in the process of cropping. Although ACV was aware of it, they did not take any proper measures to prevent it. In the end, only a limited amount of pasture grass was cultivated.

The workshop for evaluation was organized in the 4th of December 2009, with 18 members in order to address the issue regarding the illegal cultivation. The conference revealed that farmers did not understand the huge loss caused by the illegal cultivation. The study team hence explained the potential yield that could have been gained by benefit estimation using three cases. The three cases are the estimation on the sales of cultivable pasture grass in 2.7 ha as (1) raw pasture grass, (2) milk, and (3) natural cheese.

Cost Estimation of Three Case Studies

As a result of the estimation, potential yields produced by the activities are described as follows.

Products	Unit Price (ECV)	Production/2.7 ha/year	Sales/ annual (ECV)
Pastoral grass	10,000/t	25.9 tons	259,000
Milk	80/L	14 cows x 15 ℓ/day/cow x 210 days/year	3,528,000
Cheese made of milk	200/unit*	44,100 ℓ/year x 1unit*/3 ℓ	2,940,000
Milk of the goat (Canárias)	120/L	76 cows x 3.5 ℓ/day/cow x 300 days/year	9,576,000
Cheese of the goat (Canárias)	250/unit*	79,800 ℓ/year x 1 unit*/2 ℓ	9,975,000

*1 Unit of cheese: 250 g

Case 1

It is presumed that 25.9 tons of pasture grass can be cultivated in 2.7 ha of the arable land annually. If all of them are sold in the market, farmers can benefit potentially ECV259,000.

Farmers can gain more sales benefit from the pasturage if they are utilized as forage.

Case 2

In the case of producing milk, 14 dairy cattle can be bred by 25.9 tons of pasture grass, with each of the cow milk producing 15 liter of milk annually. However, since farmers can be involved in dairy husbandry only for 210 days, gross volume of production shall be 44,100 liter. If it is sold at ECV80/liter, farmers can benefit ECV3,528,000.

Case 3
If farmers process milk into cheese, instead of selling as milk, 3 liters of milk are required for a unit of cheese. Since the unit price is ECV200, farmers gain ECV2,940,000, if 44,100 liters of milk are processed into milk.
If farmers use Spanish Canarian goat, they can expect ECV9,57 6,000 in milk and ECV9,975,000 by processed cheese.

After explaining the estimation, participants understood how significant they lost the volume of pasture by illegal cultivation. Countermeasures proposed by participants are listed below.

- Since the residents who do not participate in the ACB activities were involved in the illegal cultivation, instruction is needed to them
- The patrol was asked to the forest protection officers; however, they rejected the inquires, since ACB have primary responsibility for the protection of pasture grass. The cooperation from the officers shall be required since then.

Dissemination seminar was organized in January 26, 2010 with 17 members from 6 ACB from other watersheds. In the initial stage, the Team attempted to disseminate the outcome of the Pilot Project in Rui Vaz, the target area, to two other ACBs (of Longueira and of Serra da Malagueta) in ZAE IV where forest exists; however, it calls upon three other ACBs (of Pedra Comprida, of Covada and of Fundura) which are in the higher altitude than the two[3]. The main views by the participants, after explaining the Pilot Project, are as follows:

- In Rui Vaz, the patrol by the forest protection officers was required; however, he rejected the requirement, since ACB has primary responsibility for the protection of pasture grass. Yet, ACB shall talk to the protecting officers in advance, in order to share the sense of cooperation for mutual benefit, since ACB can not accept the case. Also, ACB learned many lessons from the experiences of that the most pasture grass is stolen, and these lessons can be made the best use for future activities.
- We, ACB of Serra Malagueta, would like to implement the same project, since there are similar protected forest in our district. The components of the seminar are highly interesting, and we would like to share information with members who could not participate in this seminar. We will ask for the assistance from ACB of Rui Vaz to reference lessons learned, if similar project will be implemented.
- We, one of the members of ACB in Longueria, used to pick weeds up from the protected forest, in order to feed livestock animals a few years ago. However, we learned such practice was harmful for the protected forest in the perspective of the soil conservation and conservation of the agricultural land in another seminar in last year. We would like to let the other rural residents

[3] There are two mountainous terrains in the central and North Eastern part of Santiago Island, whose peaks are 1,392m and 1,016m respectively. Among the six ACBs which participated in this seminar, RuiVas, Longueira, and Covada are located in the central part, whereas Serra Malagueta, Fundra and Pedra Comprida are located in the North Western peak of the terrain.

know the issue. Also, we can lessen some of the concerns we are facing, if pasture grass can be produced in our area where both arable land and jobs are restricted.

- This seminar was meaningful, although there are no forest in the district of Fundra ACB. Actually, farmers in our region fetch weeds and billets from the neighboring protected forest in Serra Malagueta, since the steep geography prevents production of forages for livestock animals in our region.
- ACB of Longueira has participated in the seminar before, and been instructed that the destruction of protected forest was equal to the destruction of the livelihood of children. We currently try not to cut down trees. We have gained plenty of fruitful lessons from the seminar.

6.9.3 Evaluation

(1) Verification of Achievement

- Implementation of the project was conducted in the proper timing under the supervision of the functionaries of Agricultural Local Office in São Domingos.
- Pasture grass grew smoothly, through the activities that ACB cleaned weeds and scrap brush during the dry season, and sawed seeds afterwards.
- Most of the pasture grass, unfortunately, was stolen, due to inappropriate maintenance of ACB. Therefore, the project objectives were not achieved, as the expected outcome was not obtained.

(2) Verification of Implementation Process

- Agricultural Local Office in São Domingos and ACB of Rui Vaz well recognized this project. However, pasture grass were stolen by the other rural residents who did not participate in ACB, although they grew rather smoothly by the middle of the process.
- ACB attempted to ask protection officers, who were in charge of restoring protected forest, to conserve pasture grass, which was declined in the end. It is considered that non ACB members committed illegal cultivation; therefore, rural residents can enjoy the fruit of success by including them as beneficiaries.

(3) Evaluation Result by Five Evaluation Criteria

The evaluation result of this component by five evaluation criteria is as follows:

<u>Relevance</u>

- Enforcement of sustainable management of natural resources is of primary importance, and is corresponding to PEDA.
- Protected forest was put in place for the purpose of soil/natural conservation, due to the steep landscape and abundant rainfall. Especially, appropriate management of forest in the upstream should be strengthened, as it affects surrounding environment, chiefly water in the middle and down stream.
- Farmers are forced to practice agricultural activities on very narrow and steep land in ZAE IV where expansion of the agricultural land is nearly impossible. Also, due to the fact that

cultivation of food crops and fruits is legally banned in the protected forest, farmers cannot produce food in the area. On the other hand, residents are required to conserve forest. Therefore, residents can be motivated for the forest conservation by covering the soil with forage crops for soil conservation and for feeding livestock animals along the line with cleaning weeds and bushes.

- Women account for the large percentage of population, since men are working as rural migrants. Activities of small livestock animals feeding and milk production are suitable for women.

Effectiveness

- ACB seemed to passively participate in the project, although it was initially desired by themselves. They did not take drastic measures to combat illegal harvest of pasture grass after they recognized the case, and most of the pasture grass was stolen at the end.
- The purpose of the project lied in the sustainable management of both the conservation of environment and income generation of the residents. However, this project ended up with no contribution on the income generation of rural population.
- On the other hand, the project contributed to the conservation of environment within the protected forest. This is because, coverage of the soil with weeds and trees prevents soil erosion, water recharge and restores forests.

Efficiency

- Cleaning of weeds and brushes in the target area of 2.7 ha cost 712,000 ECV. Farmers sawed five species of forage crops (37,500 ECV/240 little in total). On the other hand, only 3,250 ECV was accrued from the sales of 650 kg of fuel woods in the process of cleaning.
- 25.9 tons of pasture grass can be produced out of 2.7 ha of land, which is estimated to be sold at 259, 000ECV. The study team confirms that more profit can be accrued from the pasture grass, if used as forage.

Impact

- Attempts to realize both the conservation of protected forest and income generation by planting pasture grass in the protected forest were implemented for the first time in CV. The extension seminar itself appeared to receive good responses from ACB members in ZAE IV of other watersheds.
- The government of CV has been trying to include rural residents into the management and maintenance of protected forest. If the project is entrenched to the rural residents, the project can contribute to the increase in the yields of agricultural produce.

Sustainability

- This project component requires at least initial investment (e.g. cleaning of woods, purchase of livestock animals, processing and milk production, and storage facilities). External and administrative assistances are required, as ACB might not be able to prepare all the investment.

- Also, continuous assistances from the administrative wing shall be prerequisite for the operation of the projects, as this is entirely new to CV. Good practices can support the extension and expansion of the project, considering the minimal technical obstacles.
- Sustainability of the project can be promising, if the projects internalizes system that could provide benefit to non ACB members.

6.9.4 Conclusion

Confirmation of Hypothesis

Hypothesis: Legal production of pasture grass in the public protected forest with conserving the forest will be realized.

The hypothesis could not be proved, since the project could not attain the cultivation of pasture grass. However, it was verified that 1) conservation of the protected forest by cleaning and growing pasture grass was possible and 2) coordination of ACB involving DGASP and the Agricultural Local Office enabled production of pasture grass in the protected forest where agricultural activities were not allowed. Also, although this project failed to reach harvest of pasture grass, it proved that utilizing pasture grass to livestock breeding can boost farmers' income significantly.

Conclusion

This project paved a way to create the first case for rural residents to manage forest, since the government of CV had set the policy that the protected forest shall be managed by the rural residents. Even if the government implemented the policy in order to alleviate budgetary constraints, it might not be feasible to presume that farmers take initiative in management of pasture grass without economic incentives. However, the result of cost estimation of productivity in implementing this project motivated farmers to manage protected forest. Considering the circumstances, this project is considered to be feasible.

The result of this project shows that it is possible to produce pasture land in the protected forest and the cultivated pasture can be utilized for improvement of farmers' income. Also, since not only economic necessity, but also validity in forest management prove the possibility of extension of the project to other areas, the study team considers the project as a high-priority program. However, in implementing the project, it is required to establish system to include non ACB members so that it will gain the project acceptance from them. Consequently, it will function as a mutual observance system.

Establishment of the system described above and obtainment of cooperation from forest protection officers are prerequisite for implementing the project as an Action Program. Also, same as in the project of soil and water conservation project, considering the peculiarity of ACB, it is required to train the leaders by "Group Leaders Training" for smooth implementation of the project.

6.9.5 Lessons Learned and Reflection to Action Plan

Table 6.9.3 Lessons Learned and Reflection to Action Plan: Forage Cultivation with Forest Conservation

Lessons Learned from Pilot Project Implementation	Reflection to Action Plan
• Widely inform other rural residents on the implemented projects. • Promotion of the coordination with the protection officers for the conserved forests.	→ Include the personnel who wish to participate in the projects, other than ACB → In initiating the project, workshop shall be organized for those who are involved in the projects.

6.10 Process and Evaluation of Project Component: Agricultural Produce Processing

6.10.1 Profile and Objectives

Generally, retail price of agricultural produce are decreasing and low quality produce lacks marketability in the busiest agricultural season. This project aims at the value addition of the agricultural produce by processing vegetables and fruit. Additionally, food security, in the seasons when they face lack of food, by conservable produce is expected.

The study team selected tomatoes for common crops, as farmers produce tomatoes in the areas where irrigated agriculture is practiced. However, since the fresh tomatoes are generally sold at rather expensive price, tomato processing is only suitable in October and in November, when supply in the market surpasses the demand for them, and the price decreases,. Therefore, processing of tomatoes was supplemented by papayas, since it might be inefficient to invest processing facilities only for tomatoes. Also, chili dressing and sausage making were practiced in the circumstances where rural residents have difficulty in accessing the irrigation water for cultivation of vegetables and could not make their stable cultivation.

6.10.2 Activities

This project component was implemented for ACB members of João Garrido, located in ZAE III in the initial course. The second course was targeted at members from five ACBs (Praia Baixo, Achada Baleia, Baía, Tinca Dobe and Moia-Moia), and organized in Baía.

The following is the achievement of activities.

Table 6.10.1 Activities: Agricultural Produce Processing

Activities	Expected Results	Schedule																	Responsible officers	input
		2008			2009												2010			
		o	n	d	j	f	m	a	m	j	j	a	s	o	n	d	j	f	m	a
1-1 Securement of the processing farms by ACB	Decision of the location												■	■							ACB	ACB
1-2 Participation of ACB members to participate in the seminars for processing industry	Comprehension of the operation of processing industry														■						Counter parts, external advisers	CV: Functionaries and ACB JICA: Members of the study team, external advisers, cost for the training, etc.
1-3Organization of the seminars by ACB for the purpose of disseminating the outcome for extension officers of agricultural local office	Acquirement of knowledge on the processing industry by extension officers																	■			Counterparts and ACB	CV: Functionaries and ACB JICA: Members of the study team and external advisers

The first course

Training was organized for ACB members of João Garrido during the five days from the 4th of December. Contents of activities are shown below:

10 women participated in the training. The project did not restrict participation by gender category, in selecting the participants; however, all the participants were women.

Planned dates are shown below:

Table 6.10.2 The First Training Course of Agricultural Produce Processing

Date and Hour of Organization		Contents of the Seminars
4th December	Thu.	Vending of the Produce
5th December	Fri.	Standards of agricultural produce, Food sanitation, Evaluation of the lectures.
8th December	Mon.	Apprenticeship for the papaya jelly
9th December	Tue.	Practical work for the sausages, and meet sanitation
10th December	Wed.	Practical work for making tomato paste, evaluation of the course

Participants positively attended in the training course, and it was highly evaluated in the post questionnaires. Some of the participants have experienced the similar courses before, assisting the lecturer to take lead the beginners. All the participants, although they cooked sausages for the first time, were enjoying the training in collaboration with the counterparts.

Evaluation meeting was held to gather participants in the 9th of February 2009, after two months of the training. Sweets made by papayas in plastic bags were rotten immediately after a week passed. On the other hand, bottled papayas were preserved properly. As for tomatoes, the ones in unsterilized bottles turned color in brown, whereas processed tomatoes in sterilized bottles were preserved in good condition. They taught that both papayas and tomatoes can be preserved in at least a year, if properly undergoing sterilizing process. If sterilization is not performed completely, the processed produce keep good for one to two months. Also, training for bread, cake making and

fancywork were raised in wish list for the next training.

Reflecting the outcome of the evaluation meeting, extension seminar was organized for the representatives of ACB members, in addition to the previous participants. Each ACB selected their interested processed agricultural produce, based on the case of João Garrido, according to the natural and environmental circumstances where each of the ACB is immersed. Also, it is worthwhile noting that counterparts were actively engaged in the training. From this perspective, DGASP could take initiative to organize continuous projects in near future.

The second course

The second training course was organized on the 23rd of November 2009. As a result of selecting participants without setting any gender condition, it turned out that all the 21 participants were female (4 in Praia Baixo; 5 in Achada Baleia; 4 in Baía; 4 in Tinca Dobe; 4 in Moia Moia).

The planned schedule is laid down below.

Table 6.10.3 The Second Course of Agricultural Produce Processing

Data (2009)		Contents of Activities
23rd Nov.	Mon	Sanitary management, management for the marketing
24th Nov.	Tue.	Preparation for the ingredients of sausages, and cooking chili dressing
25th Nov.	Wed.	Cooking of Papaya comfiture, Stuffing sausages, and reeking
26th Nov.	Thu	Cooking of tomato paste, reeking of sausages, evaluation questionnaires and general comments

In the 9th of February, the extension seminar was held for the 7 participants to present the results of the project to ETER of MADRRM, extension officers of agricultural local office of São Domingos, and some members of ACB of João Garrido.

This activity gained high reputation from the participants, and most of them anticipated other related practical courses. However, some 90 percent of participants pointed out the difficulties of procurement of ingredients and lack of finance. Also, processing of agricultural produce requires massive amount of water, which makes it difficult to extend the project in CV where the water is valuable.

Cooking Tomato Pastes

6.10.3 Evaluation

(1) Verification of Achievement

- The study team implemented the Pilot Project twice in December, 2008 and in November, 2009.
- The first training was cited in João Garrido, located in ZAE III, adjoining to São Domingos, 1 km from a main arterial highway.
- The second course was implemented in Baía, a semi agricultural and semi fishery village, targeted at five ACBs located in ZAE I, 10 km away from an arterial highway.
- Participants were actively engaged in the training, as the component was created in consultation with the representatives of ACB. They asked qualified questions in the entire trainings. At the end of the course, there were strong requests for continuing the program.

(2) Verification of Implementation Process

- In João Garrido, participants thought the processing of sausages with purchased pigs alive was more economical than that of purchased meat.
- The second training was implemented in a less convenient accessed village, in a view to extending the future project. It was ideal to organize trainings within the target area, in order to extend to the similar communities where participants dwell. However, from a view point of the organizer, it was arduous to manage power cut, procure water for cooking utensils, provide snacks for participants and deliver lunch.
- The study team had targeted 10 members per ACB in the previous training, whereas five ACBs were targeted, doubled the number of participants (21 members), as the cost for the training did not necessarily become double. As a result of increasing participants, they enjoyed positive impact that there were various ideas and questions from other participants in the lectures. On the other, hand, cooking places were too crowded for 21 participants. 15 participants should have been an appropriate numbers.

(3) Evaluation Result by Five Evaluation Criteria

The evaluation result of this component by five evaluation criteria is as follows:

<u>Relevance</u>

- It is essential to produce value-added agricultural productions in terms of food security in circumstances where a number of products are imported.
- This project can contribute not only to income generation by means of sales of processed produce, but also to job and income creation by processing industry in rural villages.
- This project component is stated in Strategic Plan for the Agricultural Development to 2015 and Action Plan from 2005 to 2008 (PEDA), the supreme plan of this project.

<u>Effectiveness</u>

- In terms of food sanitation, the study team and participants prepared two samples in order to compare 1) processed produce in plastic bags and binned produce and 2) properly sterilized

processed produce and produce without proper sterilization. Participants observed and evaluated those produce in the evaluation seminar two months after the first session. Sweets made by papayas in plastic bags were rotten immediately after a week passed, whereas bottled papayas were preserved in good condition. As for tomatoes, the ones in unsterilized bottles turned in brown, whereas processed tomatoes in sterilized bottles were preserved in good condition. Lecturers taught that both papayas and tomatoes can be preserved in at least a year, if properly undergoing sterilizing process. If sterilization is not perfected, the processed produce keep good for one to two months.

Efficiency

- In monitoring practices, participants acquired knowledge on the processing techniques and sanitation with limited time.
- Participants are highly motivated and took part in all the sessions despite the busiest agricultural season.
- Cost for fees of lecturers and training materials do not necessarily increase according to the increase in the numbers of participants in this kind of training, which indicates unit price of the seminars lowered. However, excessive numbers of participants are inclined to degrade the trainings. Two consecutive training seminars showed 15 participants might have been appropriate for a course.

Impact

- In implementing this project, technical transfer to the trainees have been completed owing to the eligible lecturers. However, limited numbers of lecturers and expensive hiring cost can be hindering factors to sustain the project.

Sustainability

- The study team elaborated and distributed manual so that farmers can remember transferred techniques.
- Since low quality tomatoes acquired in each farm house are insufficient for processing, securing sufficient volume of tomatoes through collective marketing shall be required.
- In order to sterilize the food, securing the bottles with metallic caps shall be required. Difficulty in obtaining empty bottles for processed produce is another concern.
- Difficulty in the procurement of ingredients and lack of input complicate extension at micro level.
- Processing of agricultural produce requires massive amount of water, which makes it difficult to extend the project in CV.

6.10.4 Conclusion

Confirmation of Hypothesis

Hypothesis 1: Processing of agricultural produce contributes to the increase in the conceivability and to improvement of nutrition condition.

Hypothesis 2: Value addition to the primary produce enables improvement of family budget in the rural areas.

Hypothesis 3: Entrepreneuring of processing industry can create jobs available in the rural areas.

Since the time was not enough for the participants to practice the agricultural produce processing after they had received the training, and simultaneously they were busy for the irrigation farming season between the end of the rainy season and the Carnival in February, the most participants did not practice it in cooperation with other residents. Hence, these hypothesizes were not verified.

Conclusion

Almost all the participants in this training course in the Pilot Project approved the effectiveness and efficiency of the components, showing their will to continue the project. In reality, lack of funding resources for continuous implementation of the project and difficulties of procurement of ingredients proved the hurdle for the continuous implementation. More over, even though it is easy to procure propane gas any where in the villages which is indispensable for the processing, it is very difficult to procure the water. And it limits the extension of the processing. In addition to this, the study proved that imported tomato pastes are easily available for people in CV, seemingly losing competitiveness in terms of cost reduction.

Therefore, it is difficult to put the priority on this project as a program of the Action Plan, taking every factor of the above-mentioned into consideration, even this project has relevance.

6.10.5 Lessons Learned and Reflection to Action Plan

Table 6.10.4 Lessons Learned and Reflection to Action Plan: Agricultural Produce Processing

Lessons Learned from Pilot Project Implementation	Reflection to Action Plan
• Efficiency of the training can be lowered, unless appropriate numbers of trainees participate.	→ It is necessary to control the appropriate numbers of students.
• The numbers of lecturers are limited with high salary.	→ Training programs to train extension officers to make them possible to lecture the possessing of agricultural produce shall be prepared.

6.11 Process and Evaluation of Project Component: Rationalization of Market Distribution

6.11.1 Profile and Objectives

There seems to be no good case of practices of collective marketing of agricultural produce in the target area, each of the producers is selling produce to the public retail market via shared buses, negotiating with retailers with cash transaction.

In the absence of public service on the market information, this project attempts to establish cooperative system and strengthen bargaining power in order not to be damaged in the sales of agricultural produce. Also, accumulation of agricultural produce enables diversification to the

processing industry.

This project component is not conducted based on the training, but by trial and error approach. The study forms two groups (group which practice collective marketing, and group of farmers who continue individual shipment) within the set duration, and compares the superiority of data from monitoring.

6.11.2 Activities

This project component was implemented in João Garrido, located in ZAE III. The following is the achievement of activities.

Table 6.11.1 Activities: Rationalization of Market Distribution

Activities	Expected Result	Schedule																		Responsible Officers	Input
		2008			2009													2010				
		o	n	d	j	f	m	a	m	j	j	a	s	o	n	d	j	f	m	a	
1-1 Place securement of collective marketing by ACB	Decision of the places													■							ACB	ACB
1-2 Normalization of agricultural produce	Decision of quality													■							Counterparts External Advisers	CV: Functionaries and ACB JICA: Members of the study team and external advisers, cost for the training seminars
1-3 Participation of ACB to the training seminars with regard to the collective marketing	Acquiring the knowledge of collective marketing													■							Counterparts, ACB	CV: Functionaries and ACB JICA: Members of the study team and external advisers
1-4 Operation of the practices of collective marketing	Appropriate management of collective marketing													■	■	■					Counterparts, ACB	CV: Functionaries and ACB JICA: Members of the study team and external advisers,
1-5 Monitoring by extension officers of agricultural local officers and ACB	Clarification of advantages and difficulties in collective marketing													■	■	■					Counterparts, ACB	CV: Functionaries and ACB JICA: Members of the study team and external advisers
1-6 Organization of evaluation workshops by extension officers of the agricultural local office and ACB	Sharing of reflection																■				Counterparts, ACB	CV: Functionaries and ACB JICA: Members of the study team and external advisers, cost for the training seminars
1-7 Organization of seminars for the purpose of disseminating outcomes to extension officers of agricultural local office	Acquisition of knowledge on the collective marketing by extension officers																	■			Counterparts, ACB	CV: Functionaries and ACB JICA: Members of the study team and external advisers

This Pilot Project aims at estimating effectiveness of collective marketing by groups of farmers. It compares 11 farmers who practice collective marketing and other 11 farmers who do not. Members were categorized randomly, and shipment was recorded daily with allocated responsible personals.

Since neither members of collective marketing nor persons in charge of the record had experienced such activities, numerous accidents happened during the monitoring (e.g. loss of the record, mistakes during the data collection, shipment methods, entrance fees for the public market, selection of venders, difference in measurement, lack of bargaining power).

As for the retailers, the study team presumed that farmers would sell their produce to the sales

brokers driving with cargo trucks. However, these brokers only purchased high qualified fruit, such as bananas, watermelons, or do not purchase matured tomatoes as they ship them to other islands. Farmers were compelled to bring and sell their produce in Plato public market in Praia, in the end. Manager of the Pilot Project weighed the produce in buckets of 30 kg, while retailers weigh 2 kg at a time in their balance, which is why the discrepancies in calculation frequently occurred.

As for the lack of bargaining power, as shown in the graph below, buyers did not attract the amount of shipment farmers proposed (maximum shipping volume from 11 members of the group weighed 204 kg, and median of it weighed as little as 71 kg). Since there were several retailers who would arrange the transport of cargo, if shipping volume weighed more than 300 kg, it is assumed that, in order to gain bargaining power, farmers should generate 300 kg or more produce with consistency. Moreover, producers generally bring goods to the warehouses between late afternoon and evening; however, when producers made a phone call to retailers after all the produce had been assembled, they were already asleep; and when they called the producers early in the morning, the wholesale selling price had been already fixed.

Also, experiment revealed that some of the producers sell agricultural produce individually out of the mistrust among members and to the managers. Mutual mistrust is the largest obstacle in this kind of cooperative project, and has been the major hindering factors in implementing collaborative project in CV. This was a Pilot Project that would deploy at all costs, since it was obvious that farmers could not leave the primitive level marketing which had been continuing without change for ages.

The study team organized workshops in 21st and 22nd of October 2009, and participants carried out activities from the 23rd of October till the 24th of December 2009. The workshop spared substantial time to make representatives of ACB and participated farmers understood the concept of this project. The study team initially gave explanation to the farmers of ACB via representatives; however, it explained to the farmers directly in the middle of the program, as it seemed to make no progress. In order to break the impasse, the study group held meetings in the evening, instead of the daytime, for a trial. Consequently, the project component progressed gradually, with new members coming to the meeting.

Regarding the standards, represented by the grades of produce, discussion was proceeded to implement them in order to simplify the transactions on phones. However, participants only employed three grades, which means ‘ good (A)’, ‘ not good (B)’ and ‘ not marketable (C)’, while detailed standards, such as scales and varieties, were not utilized.

The followings are the result of transactions during the monitoring of this project.

Ratio by weight of Classes A and B are 8:2, among the transacted tomatoes, and Class C was not included in the survey, as they were consumed at home.

Following chart shows the volume of shipment by the group of collective shipment and the group of individual shipment:

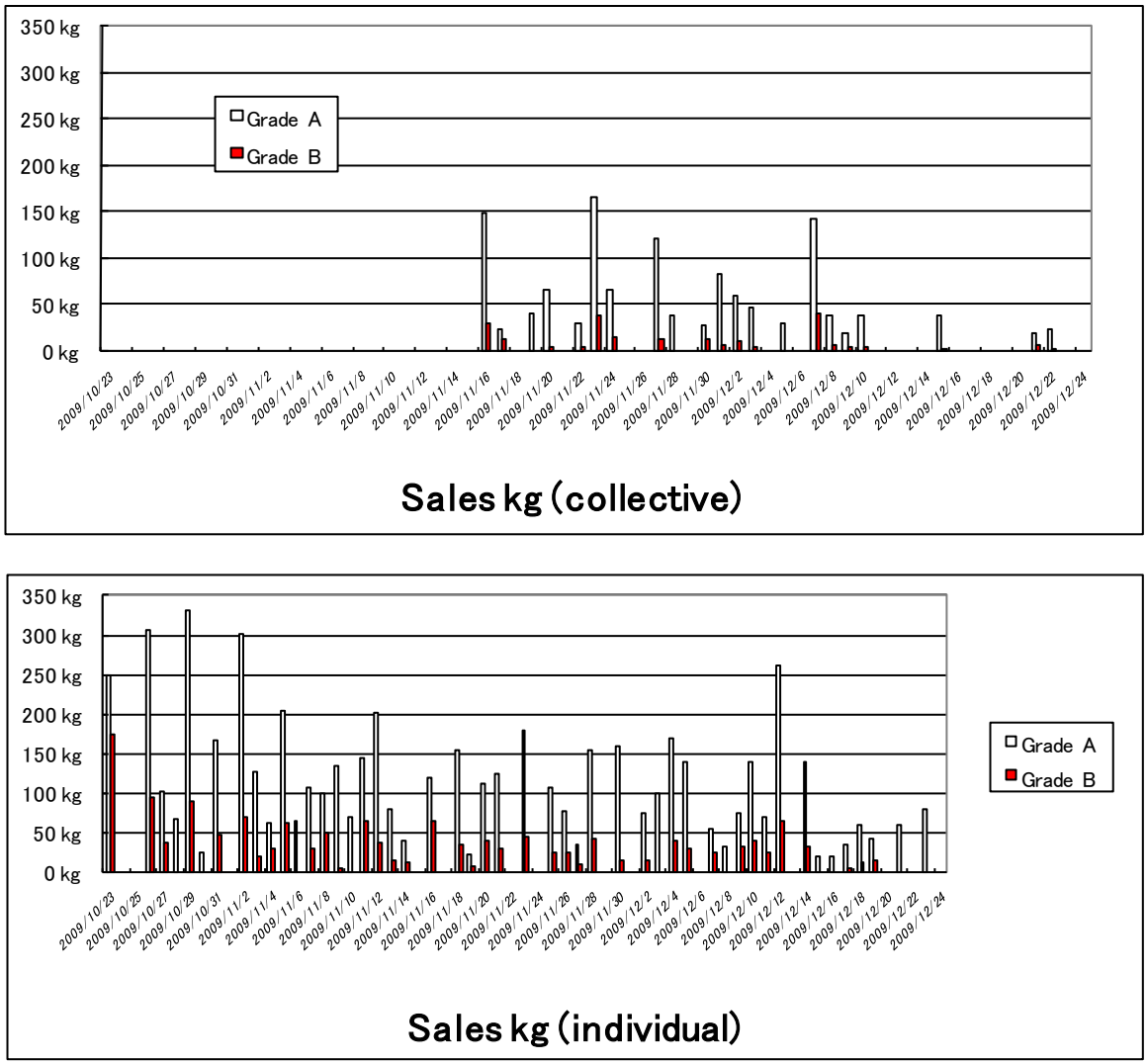
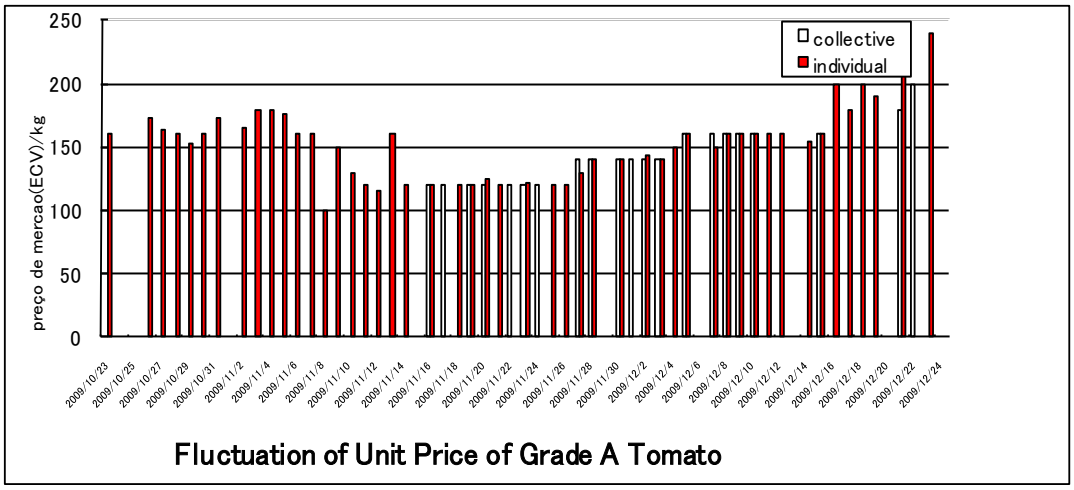


Figure 6.11.1 Volumes of Sales by Collective Marketing/ Individual Shipment

The volume of sales of the group of collective marketing (1,263 kg of Grade A; and 218 kg of Grade B) significantly fall below that of individual shipment (5,678 kg of Grade A; and 1,488 kg of Grade B). As mentioned before, the group of collective farmers shipped significant amount of agricultural produce individually. The reason behind it, according to them, was 'mistrust', which appeared as the discrepancy in the sales of the two groups which originally had been chosen randomly.

Median of the price of sales for the Grade A and B tomatoes will be respectively shown below.



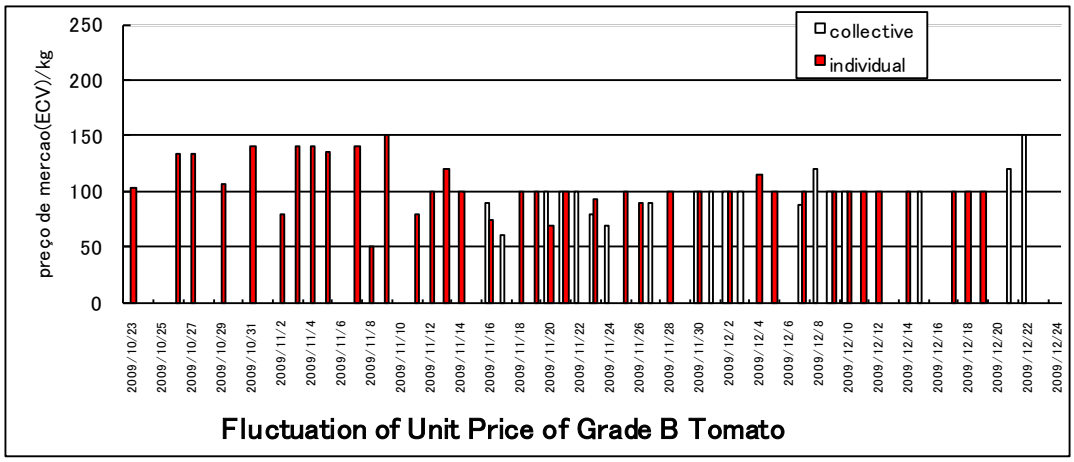


Figure. 6.11.2 Sales Price by the Grade of Products

There seems to be no significant gap between the groups of the two in the sales prices of Grade A and B. This result did not prove that the bargaining power of the group brought about the sales price of the group of cooperative collection and shipment would be larger than that of individual shipment, as a result.

Cost for the sales is shown below.

Table 6.11.2 Cost for Sales

Items	Unit Price（ECV）
Shared buses (Outward)	
Passengers	100
Tomatoes (30 kg in bucket)	100
Shared buses (Return)	
Passengers	80
Empty Buckets	0
Entrance Fee for the Public Market	
Tomatoes (30 kg in bucket)[4]	100

[4] It depends on the negotiations that which side would pay for the fees. If producers bring agricultural produce in the market, sellers are obliged to pay for the fee. On the other hand, if a deal is done in outsied the market, venders should pay the entrance fee.

Reflecting this result, the study organized evaluation workshop on the 27th of January 2010 with 18 participants in total from the two groups.

Members in the group of collective marketing secretly sold the produce, despite that they were obliged to ship them in group in the beginning of the project. However, when a part of group members started collective marketing, they learned that full-time managers were taking care of all the process to pay cash based on the volume, once farmers brought produce in consolidating points. Other members started to bring in their produce in the market. In addition to this, some participants from the group of individual shipment offered to transfer into the group of collective shipment, and other farmers outside the monitoring wished to participate in the collective shipment.

However, the result did not prove the prospects that the bargaining power of the group would bring about the sales price by the group of collection and shipment would be larger than that of individual shipment. This indicates that collective marketing did not work as a bargaining power in the market. The study team predicted repulsion and criticisms against the project, since one of the objectives of this project component was to prove the strength of the articulated bargaining power.

On the contrary to the prediction, however, all the members who participated in the workshop acknowledged the benefit of collective collections and shipment, and wished to continue the project themselves and augment the numbers of the participating members. Mutual mistrust, which is the stumbling block for the development in this island, seemed to disappear. This project brought the sense of mutual trust, and some participants answered they came to believe other persons for the first time.

As mentioned before, the project did not prove the competitiveness of collective marketing in the sales price; however, cost and time for the sales were apparently cut down, and accuracy of measurement, clarity of account and immediate payment were considered to be attractive for participants.

In implementing this project, management of the cargos for collective marketing, and full-time managers are included in the cost. This project has decided to pay the payroll of the managers through the de commissioned local consultants, instead of taking charge for farmers. Members accepted that they would take responsibilities for the costs for the continuation of this project. In discussions on the manager's remuneration, or if the system would pay for salaries or commission, participants came to the conclusion that managers should work on commission, not by the salaries, since the scale of farming differs from family to family.

Payment on commission is ideal and beneficial for both producers and managers, since endeavors to sell produce at high price directly linked to the increase in the commission. However, it might be difficult to set the percentage for the proportion of sales according to the appropriate managers' income level. The study group prepared for several simulations for the payment; as a result, participants all agreed that 10 percent of sales would be deposited to managers for the cost for sales from which managers allocate for the direct cost, such as transportation fees and would gain the rest of it. However, the study team recommended to adjust it keeping transparence in this

meeting as the payment would surge, if scale of the transaction would be larger than expected simulation or varieties of the produce would increase.

Most vendors favorably accepted this activity. However, competitive transactions between producers and venders were not realized, which indicated the weak bargaining power of producers. It is worthwhile noting, however, most buyers shared the notion that produce can be purchased at a higher price according to the quality and quantity of the produce. They also commented they wanted farmers to have sold more produce. Hence, it could be said the bargaining power on the price setting can be obtained by increasing the volume of sales and sales frequency through collective marketing.

As discussed before, improvement of trade channel could be beneficial both for producers and sellers. Participants seemed to understand everyone could benefit from the improvement, if it was properly operated. Also, it does not require large initial investment, such as project for water and soil development, and easy to implement.

This project entails a large problem in that farmers can not access to advisers during implementation of the collective marketing. The chances are that the activities can be suspended, once a serious problem occurs and it cannot be solved by them, since the society seems to be based on the mutual mistrust. However, the project can be extended to other areas, if farmers overcome the mutual mistrust.

Also, the study team organized extension seminar with respect to the outcome of the project, for the technical department of DGASP excluding the implementing members, extension officers of rural extension offices of São Domingos, and 4 ACBa in ZAE I in the 9th of February 2010. Members of João Garrido expressed their will to invite residents in other villages and extend this project at a larger area. In implementing the project, the study team recommended that the project be extended gradually, after the initiation in small groups and sharing information on the problems they faced and its solutions. Also, the study team made them understood the essence of the role of extension officers in sharing information.

6.11.3 Evaluation

(1) Verification of Achievement

- Pilot Project on the collective marketing was implemented in CV for two months, where farmers have rarely sold agricultural produce in cooperation with the farmers.
- The study team gained agreement from all the participants at the beginning of the project, even though it predicted the strong mutual mistrust of residents. However, participants expressed their will to continue the project, since they comprehended the purposes and benefits of the project. They started to organize meetings with a view to continuing the project, intending to increase the numbers of participants.

(2) Verification of Implementation Process

- The study team divided participants into two groups; one of them are group of farmers who practice the collective marketing, and the other is the group of farmers who collect and ship

the agricultural produce individually. The manager of collective marketing was ordered to collect data on the collection and sales, and its activities, while manager of the individual shipment was assigned to collect individual data for shipment everyday.

- Data from the group of individual shipment had been constantly obtained on the first day of the monitoring. On the other hand, data could not be obtained, since there had been no collection of produce at the beginning of the project.
- It took 25 days to assemble agricultural produce collectively since the beginning of the project, despite the random group division. During this period, the study team made contacts with some of the participants individually, wondering the extreme bias. Participants, however, replied that they had not cultivated the produce, or there had been no yields with the land covered by weeds. It revealed that almost all the participants shipped agricultural produce individually. From the outset, the study team envisaged this situation; however, it kept asking planned date for the cropping, instead of taking steps to visit the camp members and check collection, or wait for them in the market to ask them. As a result, agricultural produce was collected after 25 days had passed since the beginning of the monitoring. Volume of the collected produce increased gradually, as the wariness of the participants dwindled, although it did not surpass the volume of individual shipment.
- Throughout the period, the group of collective marketing shipped 1,481 kg of produce, while the group of individual shipment shipped 7,177 kg. It is uncertain if the difference was exclusively due to suspicion of members. However, it is believed that it could account for the part of the result, since the members themselves confessed that they were hiding the individual order.
- Counterparts were not engaged in any activity during the monitoring period. However, ACB themselves implemented monitoring and produced a result.

(3) Evaluation Result by Five Evaluation Criteria

The evaluation result of this component by five evaluation criteria is as follows:

Relevance

- There is no case for collective marketing in Santiago Island before. This project was formulated when the study team heard, in implementing workshops for selecting pilot project components, that youth subgroup members in ACB of João Garrido planned to try cooperative shipment.
- The project expects the increase in the price and decrease in the cost for sales by collective marketing, instead of shipping individually. Also, cooperative shipping can reduce both social and environmental burdens by using public transportation respectively.
- Enhancement of the distribution and entrepreneurship of farmers' groups are articulated in PEDA, which also ensures the relevance of this project component.

Effectiveness

- The benefits yielded by this project are the decrease in the cost for sales (including time) and

the enhancement of bargaining power, with regard to sales price and conditions. Group of collective marketing was able to sell produce at apparently lower price than that of individual shipment. On the other hand, this study could not prove the enhancement of bargaining power, because it did not observe the obvious gaps in the price of agricultural produce in two groups.

- Participants seemed to be relieved to understand that sales amounts were distributed immediately, and sales and its distribution were publicized.
- Sellers refuse to purchase cracked tomatoes in the market. Therefore, cracked and nearly cracked tomatoes can be utilized for processing ingredients.
- The study team was responsible for the personnel expenditure of managers in this project. In implementing the similar project, members accepted its responsibility smoothly, taking it into consideration that the selling cost would be reduced by the project.

Efficiency

- Since this project involved new attempts, the study team employed local consultants for workshops and seminars, and took responsibility for the payroll of managers. However, external economic assistance might not be required, if the project was appropriately managed, all the more what farmers needed was the contact persons who could be asked for solutions. For instance, rural extension offices and extension officers can be responsible for it.
- Person who had experienced book keeping in a shop were appointed for the manager of the collective marketing. This worked for the smooth implementation of the Pilot Project.

Impact

- In implementing this project, mutual distrust among members and to the managers diminished.
- Instead of shipping agricultural produce individually, collective marketing rationalizes the trade route, which contributes to alleviate the pressure for natural and social environment.
- Through the process of improvement of farmers' income by improved marketing of agricultural produce, all the rural residents can benefit from the project regardless of gender, ethnicity, and social level.

Sustainability

- Generally speaking, large amount of initial investment and public assistances are prerequisite for solving issues around agricultural activities, especially water and soil development. However, this project component does not require such an initial investment. It balances the losses by inefficient distribution.
- Farmers came to understand the importance of collective marketing, although it took substantial time. If they continue the project, the chances are that participants would increase and that the project would be extended.
- Bargaining power is expected to be nurtured, as the project enlarges its scale; however, several concerns can arise in case that the problems surpasses the capacity of managers. Expanding the project can intensify the frictions and problems. The role of administrative wing, therefore, is highly important in order not to go back to the individual shipment.

- Managers will have to continue their assignments, encountering problems without a concrete manual to solve problems. It is therefore important that members themselves have the ownership of the project, without delegating all the work to the managers.
- Transactions with the groups of collective marketing is new to the seller side. They are attracted to transact large amount of high quality producers, which indicates the deals can be done to fill satisfaction of both sides. It can highly influence the continuation of this project.

6.11.4 Conclusion

Confirmation of Hypothesis

Hypothesis 1: Costs for sales shall be reduced by joint marketing;
Hypothesis 2: Bargaining power of the producers shall be increased by joint marketing;
Hypothesis 3: Internal disputes do not occur with respect to the distribution of sales;
Hypothesis 4: Collective marketing enables an easy diversification to the processing industry.

Hypothesis 1 was proved, since the cost for sales apparently decreased. On the other hand, this study could not confirm hypothesis 2. This hypothesis should be interrogated in the process of this project. Hypothesis 3 was proved, since participants welcomed the reduced cost for sales, and accepted the cost for payrolls of managers smoothly. Hypothesis 4 could not be proved in this study.

Conclusion

Farmers implemented sales of tomatoes through collective marketing which was implemented in the first time in Santiago Island. As a result, collective marketing apparently reduced the cost for shipment, compared to individual shipment. Moreover, in the area where the collective action had not functioned due to mutual distrust, its possibility was acknowledged through the implementation of this project. On the other hand, collective marketing itself did not seem to improve bargaining power of farmers' group. Regarding this problem, however, the challenges can be addressed by increasing sales volume and frequency of sales in the following project.

Considering thoroughly the outcome of this project, a high priority is placed on this project as the Action Program. However, the technical assistance from the administrations shall be required, since this project is a new attempt in CV and the farmers and ACB will compose the implementers in the coming project. Therefore, it is required that necessary training for promoting this project shall be included in the Agricultural Supporting Programs.

6.11.5 Lessons Learned and Reflections to Action Plan

Table 6.11.3 Lessons Learned and Reflections to Action Plan: Rationalization of Market Distribution

Lessons Learned from Pilot Project Implementation	Reflection to Action Plan
• Major hindering factor of the project is the distrust among participants in implementing the cooperative shipment. Immediate distribution of the sales and publication of the sales and of its distribution relieve participants.	→ Clearly indicate this concern to farmers in the initial stage of this project.
• It is required to cultivate more than 300 kg of agricultural produce in order for producers to gain bargaining power in sales transaction.	→ Since most farmers are practicing small-scale farming, it is better to include as many farmers as possible. However, in implementing the project, the number of participants shall be less than the capacity of managers.
• It is important to select managers who can keep logs with a certain care.	→ If necessary, seminars for training of book keeping shall be organized.

6.12 Process and Evaluation of Project Component: Group Leaders Training

6.12.1 Profile and Objectives

Success of the group activities depends on the capacity of leaders. This pilot project aims to create awareness as leaders and to provide training on the basic knowledge in instructing group activities, by which this project attempts the implementation of appropriate group activities. Also, the group leaders meetings, which had not been carried out in the target area, were organized in order to exchange information among the leaders and revitalize the group activities.

6.12.2 Activities

This project was targeted at group leaders of 11 ACBs in Rui Vaz, João Garrido, Lagoa, Água de Gato, Milho Branco, Praia Formosa, Portal, Achada Lama, Baía, Achada Baleia and Praia Baixo, all located in São Domingos Watershed. The target ACBs became 12 afterwards, since newly established ACB of Nara, founded in May 2009, participated in the second group leaders meeting.

Table 6.12.1 Activities: Group Leaders Training

Activities	Expected Outcomes	2008			2009											2010					Responsible Officers	Input
		o	n	d	j	f	m	a	m	j	j	a	s	o	n	d	j	f	m	a	m	
1-1Farmers group leaders participate in the group management trainings	Groups management					▬											▬					DGASP, Extension officers of agricultural local office	CV : Functionaries of DGASP, extension officers JICA : Study Team, Materials for documentation, Training costs, External contracted instructors
1-2 Organization of regular meetings of leaders of ACBs	Regular meetings			・		・ ・			・ ・				・ ・					・ ・				Group leaders	CV : Extension officers JICA : Study Team, Materials for documentation, Support

1) Group Leaders Training

The First Training Course

The primary training course was organized on 9~ 12 of February 2009. Members in ACB of Mato Afonso, one of the ACB engaged in activities the watershed adjoining São Domingos Watershed, voluntarily proposed to take part in the training as guest participants, when they heard training had been organized in São Domingos. Moreover, an American Peace Corps volunteer working with the associations of farmers of Rui Vaz was also accepted as a guest member.

Components of the project and numbers of participants are shown below.

Table 6.12.2 Schedule for The First Group Leaders Training

Date	Contents	Participants	Participants	Time
9th February	Group management	Group leaders	24	8:30 - 14:30
		Extension officers of agricultural local office	2	
		DGASP Counterparts	3	
10th February	Accounting Skill (simple accounting echniques and book keeping)	Group leaders	29	8:30 - 14:30
		Extension officers of agricultural local office	2	
11th February	Accountant Skill	Group leaders	29	8:30 - 14:30
		Extension officers of agricultural local office	1	
12th February	Explanation of the contents and schedule of the Pilot Projects and exchange among ACBs	Group leaders	31	8:30 - 14:30
		Extension officers of agricultural local office	3	

Contents of the Training

In the first day, participants received group management training on which lectures were given on the benefits of grouping, rules of activities, power dynamics in groups, roles of group leaders, and communication within and among the groups.

Participants were divided into three groups, discussing components of the project, analyzing and sharing information. As a result, difficulties and promoters in group management were identified as follows:

- Difficulties identified by the group

  Lack of opportunities of members in receiving trainings;
  Low level educational attainment of leaders;
  Difficulties in the collection of union fees;
  Difficulties in the process of project formation;
  Difficulties in elaborating the minutes of meeting;
  Difficulties in collecting the financial documents;
  Lack of confidence of leaders;
  Difficulties in abiding by ACB constitution;

Difficulties in the dialogues with communities;

Some of the concerns shall be discussed in the coming group leader meetings to solve them.

- Opportunities identified by the groups of leaders

  Cooperation with other ACBs;

  Good will of the ACB members;

  Capacity for prominent initiative;

  Planning ability of ACB;

  Good circulation of information among members;

  Capacity for project formulation and management;

  Augment of levy of the cost for association in maintaining the group ability;

After the interval of the session, the lecturer gave presentation and discussed factors for the solidarity and disintegration in the group management. Participants evaluated the training session on the group management by questionnaires distributed after the conference. Part of the outcomes of the questionnaires shall be shown below:

- 100% of the respondents considered this project as very fruitful;
- 60% of the respondents recommended this kind of training should be held at least once a year;
- 76% of the participants suggested that ACB should support the cost for training of ACB members;
- 80% of the participants strongly agreed that this training contributed to the capacity building and problem solving of ACB;

The basic course for accounting and book keeping was carried out on the second and third day. In the second day, a lecture was given on the knowledge of the accounting scheme employed at NGO and grass-route level. Participants learned basic notions, such as balance of asset, structure of the balance sheet, and condition for profit and loss. In the third day, participants acquired knowledge on the annual settlement of account and asset management. They were divided into three groups, learning the grasp of asset, service life of the facilities, evaluation of the amortization of facilities, and annual management of ACBs' asset.

Also, each groups tackled simulation of the cost accounting and demonstrated models based on the outcome.

In the final day of the training, the study team explained the component of the Pilot Project with regard to capacity building of farmers and to improvement of dissemination, and implementation schedule.

Six farmers of ACB of João Garrido gave presentation on the process and its outcome of the processed agricultural produce. Farmers shared the experiences in cooking the processed tomato pastes, papaya jams and sausages to other farmers.

Participation of Extension officers

Extension officers participated in the training course, and discussed with group leaders. Through the sessions, they could grasp the difficulties farmers face in daily lives.

The Second Training Course

Group leaders training was organized during two days from 14th to 15th of January. The meeting was organized in the Agricultural Local Office of São Domingos.

Table 6.12.3 Time Schedule for The Second Group Leaders Training

Date	Content	Participants	No	Time
14th January	Roles of leaders as facilitators on the communication and participatory activities in rural and community development	Group leaders	27	9:00 - 15:00
		Extension officers of agricultural local office	2	
		DGASP Counterparts	3	
15th January	Accounting Techniques (Simulation of the practices on accounting in agricultural activities)	Group Leaders	29	9:00 - 15:00
		Extension officers of agricultural local office	2	
		DGASP Counterparts	3	

Contents of the Training

In the first day of the training, the lecture focused on the role and attitude of the leaders in community development. In the first place, the role of the leaders in smooth communication, vitalization and as development facilitators was explained. After the first session, lecturer accounted for the notion of communication. Communication was defined as the process of sending messages from senders to receivers.

Participants pointed out the importance of the participation from the communities and capacity of leaders. This indicates that participants attempted to understand the clues for successful group conferences.

Contents of the Conferences (The Second Day)

The second day was allocated to the training for book keeping and accounting. Firstly, lecturers gave explanation on the cost for agriculture and livestock breeding, differentiating the expense of the production and investment to the agricultural equipments. The expense of the operation includes that of the entire production cycle, including the expense related to the sales in the market. Having explained the expense, the lecturer taught the sales price of agricultural produce. Farmers will face serious financial trouble, if sales price surpasses the cost for production, thus they have to manage the cost for production.

Lecturer showed simulation for three local projects for the purpose of the training for practical management of agriculture and livestock management. Participants formed three groups as previous day, practically simulating the project management for three agriculture and livestock management projects. Contents of the simulations allocated to each groups are shown below.

Group 1 simulated agricultural management of the irrigated nursery plants necessary for the production of onions in 100 m^2 of the farms.

Group 2 simulated breeding of 4 pigs for 7 months, considering the points of concerns and risks regarding the livestock breeding. Cost for production and sales prices should be referenced to the market price and benefits for livestock breeders.

Group 3 simulated irrigative agriculture including the purchase of pumps and management considering the numerous concerns necessary for the crop cultivation. Farmers emphasized the importance not only of the items necessary for the cultivation, but also of the cost depreciation for pumps and other equipments.

All the participants evaluated the outcome of the simulation. The result indicated the utilization of the training. However, simulation proved that farmers had managed an impromptu management with regard to the agricultural management and cost.

Participants proposed the necessity for active technical assistance by rural extension offices with respect to the management, project formation and negotiation, cultivation and extension of the livestock breeding.

Engineers in the rural extension office announced the assistances for farmers engaged in ACBs in all the development areas, and isolated farmers and livestock-breeders.

2) Group Leaders Meeting

First Group Leaders Meeting

The first group leaders meeting was held in February 13, 2009, following the 'group leaders training' as mentioned above. Among 33 members who received training, 29 members from 11 targeted ACBs participated in the conferences. Other 4 participants came from the ACB of Mato Afoso. In the first place, a chairman, who was responsible for facilitating the conferences, and secretary who are responsible for making a record of the conferences were appointed. During the meeting, the chair person selected the members who wish to make a speech, and created speech lists on the floor.

In the first session, participants discussed the introduction of the activities of ACB, experiences from them, problems each ACB faced. Some of the problems, which were referred to in the previous training, were picked up again. For example, some ACBs which were set up recently lack capacity for the project formation, and for securing for financing. Solutions proposed by more experienced ACB was the referral to the superior organization, such as OASIS, and to rural extension offices. Other ACBs proposed the obtainment of existing project formation model and consultation with the similar new projects.

Second Group Leaders Meeting

The second group leaders meeting was held in June 3, 2009 in the agricultural local office. 24 members, out of 33 group leaders from 11 ACBs, participated in the meeting. 3 staffs from ETER and 3 from the Agricultural Local Office of São Domingos attended the meeting as observers, providing advisory when necessary.

After the explanation of the meaning of this meeting by both the engineers from the rural extension offices and extension officers, the chair person explained procedure of the meeting, and discussed following themes.

1. The first leaders meeting was held in the last February, when participants shared experiences. The discussions were whether there were the activities by ACB been continued between February and May since the meeting and what were the major obstacles in implementing the activities?
2. New activities by ACB shall be listed up in the areas below.
   - Mobilization of ACB members
   - Encounter with the communities
   - Mobilization of the partners
   - Elaboration of the project
   - Formulation of the project
   - Creation of local workforce
   - Agricultural produce
   - Livestock breeding
   - Soil and water conservations
   - Others:

Discussion was conducted in the groups of two. ETER and DGASP participated in the meeting as observers. The discussion was shown to the floor, so that two groups collaboratively led the outcome of the conferences.

Major constraints were project formation and lack of capacity for fund raising from donors. Moreover, as for the communication among the members, several ACBs observed some improvement, while some ACBs have still had difficulties in the group management.

Participants asked rural extension offices to actively engage in assisting project finding and negotiation process with the donors. Training for capacity building of the rural extension offices was also emphasized in order to enhance the assistance for rural residents.

Third Group Leaders Meeting

The third group leaders meeting was held on the 16th of September 2009. 30 participants from 12 ACBs (12 ACBs have become targeted, since newly developed ACB of Nora was approved) took part in the third conference. 2 staffs from the ETER and 4 extension officers of the Agricultural Local Office participated in the meeting as observers, giving comments when needed. The procedure of the meeting was the same as the previous meeting, where ACBs discussed with each other under the instruction of engineers of the Agricultural Local Office in São Domingos and extension officers. Contents of the discussion are shown as follows;

1. Operation of ACBs
2. Activities of ACBs in 2009
3. Difficulties they faced and solutions for the problems
4. Lessons learned from other ACBs

Participants discussed in the three working groups. Afterwards, the outcomes of each group were collected in order to share them to the floor for a conclusion. The speed to execute the projects and the level of work were superior in the experienced ACBs to the other ACBs. Authenticity of the leaders depends largely on the capacity of the mobilization of financial resources and on the implementation of the projects in the communities. Participants emphasized the importance of negotiation of funding with donors and of the training on the preparation for the projects by communities. ACBs requested the Agricultural Local Office more active assistance on the technical assistance at the community level, such as project formation and negotiation for the fund.

Fourth Group Leaders Meeting

The fourth group leaders meeting was held in January 18, 2010 in the Agricultural Local Office. 30 out of the 36 leaders from 12 ACBs took part in the meeting. Trained ACBs were as follows; Rui Vaz, Água de Gato, João Garrido, Milho Branco, Praia Formosa, Portal/Capela, Achada Lama, Baía, Achada Baleia, Praia Baixo and Nora. 2 staffs in ETER and 3 extension officers in the Agricultural Local Office participated in the meeting as observers, giving advices.

Procedure of the meeting was the same as the previous meeting. Participants from ACBs discussed expanded interaction among ACBs. Items of the discussion were shown below.

1. Benefits/outcomes and the impact of training activities and the interaction among ACBs in this project implemented from February, 2009 to January, 2010.
2. Expected concerns and obstacles in the face of the management of ACB activities
3. Conditions for sustaining positive impact to the projects
4. Definition of the roles of ACBs, institution and international cooperation in development

The followings are the opinions raised from participants in the meeting.

ACBs which implement the community projects can mobilize members, and have influences on the creation of temporal work force. Also they enjoy not only the securement of agricultural equipment and seeds, but also capacity of fundraising from NGOs, OASIS, embassies of various countries in Praia.

In reality, the importance of ACB in the communities lies more in the commission to the small scale infrastructure construction, such as dikes, small scaled dams, irrigation system, road construction and schools, than in the promotion of agricultural activities. These activities are not only implemented as the contracted projects by the government, but also are executed in cooperation with international NGOs and other donors which directly provide assistance to the communities for promoting rural development.

In order to sustain the lessons learned from this project, training and capacity building of leaders, sharing the experiences at national and international levels trainings for livestock breeders and farmers, and cooperation with the governmental organizations are required. Also, assistances from the rural extension offices are also required for the identified problems, chiefly technical assistances, activation, project formulation and negotiations. However, there

seemed frictions between the authority and ACB in the commission of the projects assisted by donors and the central government.

At the end of the meeting, the final evaluation for the training activities of the group leaders of the farmers from February 2009 to January 2010 was conducted with ACBs. The outcome of the evaluation shall be shown below.

1. More than 80 percent of the trainees, on average, participated in the trainings and the meetings.
2. Most leaders considered lecture on the importance of the experience sharing among the ACBs and communication as important.
3. Most of the leaders answered that experiences from the training improved the capacity as leaders, by improving the communication ability and knowledge on the group management and problem solving. Also, participants answered lecture for accounting was fruitful.
4. Leaders announced that they would hold regular meetings in order to share the lessons learned in the training and meetings.
5. Most of the participants stated that the Agricultural Local Office should promote the training and group leaders meeting with DGASP and MADRRM. On the other hand, farmers in ACBs should be responsible for a part of the cost, while rural extension offices should be the catalyst of the project.

6.12.3 Evaluation

(1) Verification of Achievement

- Attitude and basic knowledge required for the group activities were improved by group management, communication, basic knowledge on the accounting, and exchange of the opinion, in the group leaders training.
- This study confirmed the sharing opinions and experiences as important clue for the successful group formation from the discussions in the leaders meeting and regular information sharing.
- Leaders acknowledged the regular meetings within associations are indispensible for the purpose of the improvement of the awareness of members.

(2) Verification of Implementation Process

- 80 percent of the members participated in this activity, in the midst of busiest cropping season.
- Extension officers of the Agricultural Local Office and functionaries in ETER supported discussions in the meetings.
- Most of the participants requested the involvement of the Agricultural Local Office in the project formation and fund raising. At the same time, rural extension offices announced their will to support farmers within the mandate.

(3) Evaluation Result by Five Evaluation Criteria

The evaluation result of this component by five evaluation criteria is as follows:

Relevance

- Enhancement of communication skills, management of community associations and knowledge required for the solution for related issues were recognized as the effects of the training, which was corresponding to the initial purpose of this training.
- Participants were largely satisfied with the training sessions and wished to continue the training. Some participants even suggested to organize paid trainings. These indicated the project component satisfied the needs of participants.
- ACB of Nora in the watershed of São Domingos requested to participate in the training. ACB of Maio Afonso, a neighboring community association which heard the training, dispatched representatives to the first group leader training.
- The project component is considered to be relevant, since the implementation of this projects is corresponding to PEDA both in enhancement of human resources and in the training of community associations.

Effectiveness

- The efficiency of the project component could be approved, since the farmers actively asked for assistance of accounting which they had done at home in the next day of the accounting session.
- After the training session, leaders elaborated materials for giving feed back to the ACB members. This is the efficient methods for disseminating information in the same level.

Efficiency

- All the participated leaders acknowledged that the meetings were efficient for group leaders training. Hence, this project components satisfied the needs of farmers, since it contributed to the capacity building of leaders, and promoted the improved group management skill.
- In the leaders training, information sharing on the processing and marketing with other farmers stimulated the interest in them. There were some strong requests for the organization of training on the processing and marketing of agricultural produce.
- As a result of implementing the group leaders meeting, the study proved in the final evaluation that some young ACB leaders acquired new knowledge on the fund management, negotiation with the participants in the project, and management of community activities by sharing experiences among the experienced leaders.

Impact

- The farmers outside the target area who heard about the training sessions sent representatives to the training. This represents the high expectation of the farmers for these trainings.
- It is expected that the participation to this project by the ACBs from other watersheds would bring about the extension of the component of this training.

Sustainability

- Most of the farmers recognize the outcome of the training of group leaders in this project. Also, they wish the Agricultural Local Office to continue the program and support these activities.

6.12.4 Conclusion

Confirmation of Hypothesis

Hypothesis 1: Training of the group leaders improves the management skill of group leaders.

Hypothesis 2: Participation of group leaders to the group leaders meetings stimulates the activities of ACB.

Regarding hypothesis 1, the study team could not observe concrete effects of group activities, since the training program had only completed recently. However, in the second training session, trainees showed the effort acquired in the first training, such as improved communication skills, management of community associations and acquirement of knowledge to address the issues involved, The study team affirms the effectiveness of the project shall be proved in future. 80 percent of the leaders agreed to the effects of the participation of this training, in terms of improved group management skill and problem solving skill within the groups. As for hypothesis 2, the outcome of the final evaluation implemented in January 2010 proved that some ACBs utilized the funds for reconstruction of facilities, construction of stone masonry works, cultivation of fruit, and building of cooperative relationship in the rural communities. They are motivated by the project, since most of the farmers participated in the project for leaching salt damaged land and project for water-saving irrigation.

Conclusion

As for the group leaders training, as a result of executing project, despite that the study team could not observe concrete effects of group activities, trainees showed the effort acquired in the first training. Also, some of the ACBs, motivated by the group leaders meeting and trainings, attempted to extend their areas of activities, which indicates enlivenment of the group activities.

With regard to the project itself, it is considered as relevant, since it s promoted in the supreme plan and corresponding to the needs of farmers. Implementation of the group leaders meetings, the first trial of the targeted area, motivated participants; knowledge acquired from old ACB leaders provided effects for newly created ACB. Also, the Agricultural Local Office is interested in pursuing the project. Hence, this project can be considered as a highly prioritized action program.

6.12.5 Lessons Learned and Reflection to Action Plan

Table 6.12.4 Lessons Learned and Reflection to Action Plan: Group Leaders Training

Lessons Learned from Pilot Project Implementation	Reflection to Action Plan
• In the evaluation before the training, ACBs were expected to be proactive, since they had participated in the projects by donors. However, there seems to be huge gaps between the experiences. • Lack of the capacity both in the project formation and in the negotiation with donors are concerns which each of the ACB faces. This point has been clarified through the leaders meeting.	→ As for group leaders training, it is required to consider pedigrees and level of experiences in the discussion among ACBs. In this process, newly established ACBs can learn more from matured ACBs. → Improvement of project formation skills and capacity building are basic concerns in Action Plan, which should be strongly enhanced.

6.13 Process and Evaluation of Project Component: Extension among Farmers

6.13.1 Profile and Objectives

One of the strategies to motivate farmers is to introduce techniques of farmers in advanced areas to the farmers of developing areas in agriculture. This Pilot Project attempts to introduce extension among farmers in São Domingos. For example, farmers in developing agricultural area are invited to advanced farms to acquire matured knowledge on the production, conservation and marketing techniques. This project also provides opportunities for discussing issues they face in agricultural activities. By sharing information and techniques with farmers in advanced agricultural area, incentives of unpracticed farmers shall be improved. As a result, trained farmers are expected to maintain their motivation to increase production for more advanced agriculture. Additionally, the farmers in advanced agricultural area also enhance their knowledge acquiring new information through the discussions with the famers from the other areas.

6.13.2 Activities

This project was implemented to all the ACBs in the watershed of São Domoingos.

Table 6.13.1 Activities: Extension among Farmers

Activities	Expected Results	Schedule																Responsible officers	Inhumes
		2009					2010												
		a	s	o	n	d	j	f	m	a	m	j	j	a	s	o	n	d	
1-1 Farmers conduct field survey in advanced agricultural fields.	Motivation for the improvement of productivity						▬												INIDA, Functionaries of agricultural local office	CV：extension officers JICA：the study team, equipments for the materials, cost for the trainings, external advisors.
1-2 Farmers report the field survey in the advanced agricultural fields.	Transmission of knowledge					▪▪	▪▪												Functionaries of agricultural local office, farmers	CV：extension officers JICA：the study team, assistances

This project was originally targeted at 11 ACBs in São Domingos Watershed. These planned ACBs are as follows: São Domingos, Rui Vaz, João Garrido, Lagoa, Água de Gato, Milho Branco, Praia Formosa, Portal, Achada Lama, Baía, Achada Baleia and Praia Baixo. In addition, newly established ACB (Nora) requested the participation and was accepted to this activity. The project was implemented in January of 2010, for four days, on the visit to the advanced agricultural areas and debriefing sessions on the reflection of the field study.

1) Visit to the Advanced Agricultural Areas

Advanced agricultural areas with successful experiences in agriculture, livestock breeding and community ACB. Elaboration of field visit plan was commissioned to the Agricultural Local Office and ETER, considering the possibility of the continuance of the project in future.

Day 1 and Day 2

The programs and place of visit for the first two days are shown below:

Date: January 21

Targeted ACB: Achada Baleia, Baía and Praia Baixo

Date: January 22

Targeted ACB: Milho Branco, Praia Formosa, Portal and Achada Lama

Table 6.13.2 Places of Visit in the First and Second Days

Localities/Visited Areas	Objectives/Experiences
Experimental field at Achada Baleia	Visit JICA experimental field for alternative watering with drip and pitcher (mud pots) irrigations: technical innovation in water saving irrigation
Experimental field at Nora	Hydroponic cultivation in boxes: other technical innovation in water saving irrigation
Belém	Crops irrigated with drip technique by ACB technically supported by the functionaries of São Domingos.
Pico Leão	Irrigated horticulture of cabbage and carrot. Private enterprise supported by ACB and the agricultural local office
Cidade Velha	Fruit cultivation targeted at tourists; pineapple production with drip irrigation.

22 farmers in day 1 and 28 farmers in day 2 took part in the project respectively. 6 extension officers from the Agricultural Local Office and 2 members from ETER accompanied to farmers in the field visit.

In the experimental farm of Acheda Baleia, participants received lectures on the pitcher irrigation system operated with cooperation of JICA. The representative of ACB in Acheda Baleia facilitated the presentations. Farmers were highly interested in new irrigation techniques and possibility for the application of this techniques to their villages. Engineers in the agricultural local office explained appropriate method and several irrigation methods as a countermeasures against salinization of soils and crops, other than these methods. In Nora experimental field, elementary school teacher in Cape Verdean Institute for School Social Action (ICASE), who specialized in hydroponic culture and coordinated vegetable cultivation program, gave us presentation on the explanation for the techniques, holistic discussion, and applicability to other villages.

In Belém, farmers visited irrigated agricultural area established by the technical assistance of rural extension offices and initiative of local residents. Participants asked questions on the prioritized crops, irrigation system, price of water, existence of water, beginning period and assistance from the Agricultural Local Office.

Pico Leão is located in the border of arid area from the valleys to the base of mountains. The study tour group visited the horticultural farm operated by a young farmer who graduated from a high school. Major crops cultivated by irrigation are cabbages, carrots and cassavas.

In Cidade Velha, which was the last field visit point, participants visited the farm where tropical fruit, such as pineapples, was cultivated targeting at travelers and horticultural crops were also cultivated. Participants exchanged opinions with ACBs in advanced areas in acquiring ACB management and agricultural techniques.

Day 3

Programs and the place of visit are shown as follows:

Date: January, 25

Targeted ACB: Rui Vaz and Água de Gato

Table 6.13.3 Places of Visit in the Third Day

Localities/Visited Areas	Objective/Experiences
Experimental field at Achada Baleia	Visit JICA experimental field for alternative watering with drip and pitcher (mud pots) irrigations: technical innovation in water saving irrigation
Experimental field at Nora	Hydroponic cultivation in boxes: other technical innovation in water saving irrigation
Ribeira de Engenhos - Santa Catarina	Runoff control and irrigated agriculture

28 of farmers participated in the day 3, and 6 extension officers from the Agricultural Local Office of São Domingos and 2 members from ETER attended with the farmers. 2 engineers from the Agricultural Local Office of Santa Catarina guided the field visit. The farmers started the visit from the experimental farm in Achada Baleia and Nora. Participants, especially those from Rui Vaz showed interest in implementing the hydroponic culture in local elementary schools.

In the visit of Engenhos watershed, engineers from the agricultural local office of Santa Catarina gave explanation. This watershed is benefited from project for large scale rainfall management financed by donors, such as BADEA. This is the project for water-harvesting in this watershed, setting up reservoirs and irrigation system. Rainfall management facilities are managed by ACB members cultivating vegetables in small farms for marketing in Praia and in Assomada. Complementary small projects are in operation for the breeding of goats, rabbits, and chickens and the use of byproducts for irrigated agriculture.

Day 4

Programs and place of visit are shown below:

Date: January, 26

Targeted ACB: João Garridos, Lagoa and Nora

Table 6.13.4 Places of Visit in the Fourth Day

Localities/Visited Areas	Objective/Experiences
Experimental Field in Achada Baleia	Visit of JICA experimental field by water saving irrigation represented by drip and pitcher irrigation for inspection: technical innovation on the water saving irrigation
Experimental Field in Nora	Hydroponic cultivation in the boxes: other technical innovation in water saving irrigation
João Teves – Órgãos	Innovative irrigative agriculture by young farmers
Experimental Field (INIDA)	Experimental crops

23 farmers, 6 extension officers from the Agricultural Local Office and 2 members from ETER attended in day 4.

The field study group started the visit from the experimental farm in Achada Baleia and Nora. In João Teves, the field study group visited a consuming company dealing with fruit and vegetables. A young entrepreneur explained how to access other islands from Santiago Island. Also, he shared experiences when he attempted to introduce new crops which are hardly cultivated in CV. He offered seeds of strawberry to participants who were interested in the highly priced crops in the city markets. This strawberry is produced in INIDA and is sold in Nora, next to the Agricultural Local Office of São Domingos. He emphasized in the benefits of local species which were rich in production and more durable for the local climate and disease damage. In the farm of INIDA, the field visit group gained opportunity for observing new vegetables, such as experimented egg plants, cabbages and fruit. Lastly, they visited Poilão Dam constructed by Chinese assistance in the national project for management of surface water in CV.

2) Report from the Participants on the Visit of the Advanced Agricultural Areas

Participants who visited advanced agriculture were required to write reports on the experiences of the visit. They were also asked to do presentation so that they could share experiences with other members who could not participate in the field visit.

A debrief session was organized for the purpose of sharing experiences to other participants who could not attend the visit. Functionaries of the agricultural local office in São Domingos and ETER supervised conferences in order to promote sustainability for the outcome.

Table 6.13.5 Schedule of Sessions

The First Day

Date: January 30, 2010

Communities	Time	Supervisors
Rui Vaz	11h	Alcinda Almeida
Praia Formosa	13 h	José Gonçalves
Portal/Capela	13 h	Fernando et Giovani
Praia Baixo	15 h	Alcinda Almeida
Milho Branco	15 h	Jose Ramalho
Achada Lama	15 h 30 m	Fernando et Giovani

The Second Day

Date: February 6, 2010

Communities	Time	Supervisors
Lagoa	15 h	Alcinda Almeida
Nora	15 h	Fernando et Giovani

The Third Day

Date: February 13, 2010

Communities	Time	Supervisors
Achada Baleia	15 h	Giovanni
Baía	15 h	Alcinda Almeida
Água de Gato	15 h	Jose Ramalho
João Garrido	15 h	Fernando

Participants reported that they could share experiences with farmers in the advanced communities with regards to the source of funding, technical assistance, difficulties they faced, and conveyance of agricultural produce to the market. Pitcher irrigation in Achaba Baleia, experiences of hydroponic culture in the boxes in Nora, possibility for the breeding of rabbits by utilizing agricultural by products. All the ACBs planned to implement pitcher irrigation and hydroponic culture. Regarding the necessary equipment, confirmation of information on the cost and the stocks in the market were required. ACBs expected the Agricultural Local Office to take necessary measures as to these problems and rabbit breeding utilized by agricultural byproducts.

Field study expanded the opportunities for interacting among other ACBs and communities, in terms of the overall impression of the study. Also, participants cultivated awareness of new cropping technology, advent methods for irrigation system, and practical forms of training.

ACBs promised to continue extending the lessons learned through regular meetings of ACB and personal relationship in the neighboring farmers.

6.13.3 Evaluation

(1) Verification of Achievement

- Participants were interested in pitcher irrigation and hydroponic culture, and enjoyed course of questions and holistic discussion on the possibilities for application to their communities.
- Debriefing sessions regarding the visit of advanced agricultural areas were organized in each of the community, and participants reported the outcome with respect to the experiences and impressions to other ACB members.
- ACB promised to extend lessons learned in the visit through personal relationship within the communities or in regular meetings.

(2) Verification of Implementation Process

- Farmers were able to gain opportunities for discussing difficulties in agricultural activities by visiting advanced agricultural areas, and were impressed by improved production, conservation and marketing skills.
- Representatives of 12 ACBs in São Domingos Watershed visited advanced agricultural areas from 21 to 22 January, and from 25 to 26 January. Functionaries of the Agricultural Local Office were in charge of the visit, involving those of ETER/DGASP.
- After the field visit, the participants took part in the debriefing sessions in order to share their experiences with other members in the communities. ACBs evaluated the visit of the debriefing sessions. Farmers requested the Agricultural Local Office to continue the field visit, so that other members could see new methods of water-saving irrigation.

(3) Evaluation Result by Five Evaluation Criteria

The evaluation result of this component by five evaluation criteria is as follows:

<u>Relevance</u>

- It is expected that the Agricultural Local Office set opportunities for the farm visit for those

who did not participate in the initial visit. As has been seen from the report meeting, this project meets the needs of farmers.
- Implementation of this project is corresponding to the strategy to enhance human capacity building proposed in PEDA.

Effectiveness
- It is expected that the farmers are to be motivated by introducing advanced agriculture; however, as of today, it is not verified the output due to a short period of only half a month since the execution of visit. However, ACBs recognized the importance of trial of pitcher irrigation and hydroponic culture, and have become seriously concerned to introduce them. Satisfaction of these participants to the project can be assumed from the fact that other farmers wished for another visit.

Efficiency
- Participants could share experiences among farmers on the measures to acquire fund resources, technical assistances, day to day issues, and shipment of agricultural produce to market places.

Impact
- Participants fulfilled responsibility for extending experiences to other farmers who could not participate in the session.
- The project helped other farmers of ACB to see new irrigative techniques.

Sustainability
- Functionaries of the Agricultural Local Office and E TER planned and managed all the schedule of this project, which ensures the sustainability of the project.
- The agricultural local office is acquiring original budget for extension among farmers, since such trainings are prioritized by the government.

6.13.4 Conclusion

Confirmation of Hypothesis

Hypothesis 1: Farmers who received trainings are motivated to increase productivity by introducing the progressed agriculture.

Hypothesis 2: Participants who took the trainings come to extend experiences in their villages.

As for hypothesis 1, the study team did not spare sufficient time for validation, since only half a month had passed at that moment. However, since ACBs recognized the importance of trial of pitcher irrigation and hydroponic culture, and have become seriously concerned to introduce them. It is inferred that they were motivated by the project.

As for hypothesis 2, farmers who received training are extending experiences to other farmers. This project also ensured that all the participants shared experiences and knowledge they gained during the visit with other untrained farmers.

Conclusion

As for the extension among farmers, the study team had not verified the project sufficiently. Yet, ACB acknowledged that visit to the advanced agricultural areas promoted to exchange valued experiences between ACBs and other communities. It brought not only new irrigation system but also knowledge of cultivation technologies into communities, along with a new form of trainings. The communication ability with local engineers and innovation of the traditional cultivation techniques for new experiences were the benefits out of the visit to the areas. As discussed above, the study team observed participants were motivated to improve the productivity by introducing advanced agriculture.

This project not only is promoted by supreme plan, but also is corresponding to the needs of farmers. Also, most of the ACBs expect to continue this project for the purpose of promoting rural development. Moreover, sustainability of the project is highly promising, since the Agricultural Local Office is applying for budgetary distribution to continuously implement this project. In sum, this study considered the project as a prioritized project as an Action Program.

6.13.5 Lessons learned and Reflection to Action Plan

Table 6.13.6 Lessons learned and Reflection to Action Plan: Extension among Farmers

Lessons Learned from Pilot Project Implementation	Reflection to Action Plan
• Positive interrelatedness among projects, such as trainings, agricultural processing, and marketing are observed to influence the success of the project.	→ It is essential to promote information sharing among ACBs in the same watershed so that they become actively interactive with each other.
• Visit of more advanced agricultural areas stimulated the confidence for the improvement of most participants and communities.	→ Continuation of the extension among farmers should be articulated in elaborating the project.

6.14 Process and Evaluation of Project Component: Improvement of Extension System

6.14.1 Profile and Objectives

Capacity of the extension officers, who are the catalysts between the projects and rural residents, depends enormously on the successful rural development. Hence it is essential for them to acquire knowledge on new good agricultural technologies and transmit them to farmers. In order to realize it, this project shall implement extension trainings necessary for the capacity building of them. Also, elaboration of manual for agricultural technologies will be required, through which farmers can refer to all the time for new technologies. This project elaborates the technical manual to improve extension system, since no such manuals are available in the region. With respect to the design of the manual, assistance form the institutes, such as INIDA, which are elaborating training curriculum for farmers shall be expected. At the same time, training for extension officers shall be conducted.

6.14.2 Activities

The achievement of activities is shown below:

Table 6.14.1 Activities: Improvement of Extension System

Activities	Expected Results	Schedule 2009 j f m a m j j a s o n d / 2010 j f m a m	Responsible officers	Input
1-1 Technical department for the rural extension in DGASP and extension officers set up manual for agricultural system and extension system.	Improvement of the extension system		INIDA, DGASP, agricultural local office	CV: Extension officers JICA: Implementation cost, external advisers
1-2 Extension officers provide assistance to promote ownership of the local government by taking trainings on the participatory methods.	Improvement of the assistance for local government		Agricultural local office	CV: Extension officers JICA : The study team, Cost for the training, support

1) Elaboration of Manual for Agricultural Technologies

Elaboration of manual for agricultural technologies was initiated in February of 2009. This manual was elaborated by staffs of DGASP and ETER, extension officers of the Agricultural Local Office in technical cooperation with INIDA. This project attempted to draw up manual which was helpful both as tool for agricultural activities and as materials for training. It also worked as instruction for extension officers. By learning these materials, technical department for Agricultural Extension in DGASP and extension officers of the Agricultural Local Office seemed to learn substantially from these processes.

Participants

In elaborating manual, extension officers of the Agricultural Local Office and 6 ETER staffs of DGASP took part in the processes, in technical cooperation with the INIDA advisers.

Contents of Manual

The followings are key points in elaborating manual:

1. Measures to improve soil fertility to augment the yields.
2. Agro-forestry
3. Efficiency of the system on the water-saving irrigation and on water management
4. Environmental conservation
5. Improvement of technologies for livestock breeding

Procedure

On 17th of February 2009, functionaries of INIDA and DGASP discussed the components to incorporate into manual, considering the interests of farmers. The discussion was based on the old extension manual in 1994, targeted at the district of Santa Cruz. Reflecting the outcome of the discussion, functionaries of INIDA shall draw up the draft manual for explaining to the people concerned.

The referenced old extension manual by the old Ministry of Rural Development and Fisheries emphasized on the production of citrus, indigenous products of the district of Santa Cruz. This might be a prominent referenced manual for extension officers in São Domingos; however, it

does not reflect all the characteristics of São Domingos Watershed. Therefore, this project aims to elaborate manual which considers the needs of rural residents of the Watershed and various activities in ZAE I - IV.

The second session was organized in the main body of ETER in June 2, 2009. Ms. Angela, a counterpart of this study, 4 affiliates of DGASP/ETER, 3 extension officers of the Agricultural Local Office in São Domingo, local consultants, and an expert of JICA study team took part in this session. Contents of the manual were confirmed in this session.

ETER broadcasts TV programs every Monday in (19:30~20:00), and radio programs every Sunday (7:00~8:00), sharing experiences of rural development. Mr. Fonseca who directed ETER agreed to use this program for the advertisement of this project. As a result, during the implementing period of the Pilot Project, ETER recorded the situations for activities and edited it, and the film was broadcasted in November, 2009. In this broadcast, this Development Study and the Pilot Project were introduced to the whole country.

A meeting was held in the main body of ETER in January 19, 2010 for explaining the draft manual elaborated by functionaries in INIDA. Participants made comments on it with active discussion, comment being reflected on the draft, and the sentences being added and altered.

2) Training for Extension officers

This training for extension officers concentrated on the project formation, project management and operation, group operation, identification of problems and problem solving in line with the elaboration of manual for agricultural technologies. Also, this training introduced several tools for participatory approach.

Lecturers

Advisers on the participatory approach

Participants

Major participants of the training are extension officers, who directly talked to farmers on daily base, in the agricultural local office, ETER staffs of DGASP.

First Training

Date: June 8~12, 2009

Participants: 5extension officers of the Agricultural Local Office and 3ETER staffs of DGASP

Contents of the training are laid down as follows: ‘ Extension and Participatory Methods’ ‘Participatory Methods and Communication’, ‘Participatory Methods and Group Management’, ‘Methodologies and Techniques for Extension’, ‘Participatory Rural Appraisal (PRA)’, problem analysis and explanation of the project. The training consists of four-day lectures and one day field work. Flowingly, ACB of João Garrido and Milho Branco practiced participatory methods. As a result, the limited irrigated area were pointed out as a problem. Also, the outcome of the evaluation showed that participants were satisfied with the training.

Table 6.14.2 Schedule for the Training Course (Day 1)

Date	Training Contents
June 8, 2009	Brief explanation of the training, explanation of the notion of participatory methods (top-down and bottom-up approaches)
June 9, 2009	Explanation of the participatory approach (participatory methods and communication, participatory approaches and group management, methodologies and techniques for extension)
June 10, 2009	Problem analysis and solving, methods for elaboration and implementation of the plans
June 11, 2009	Field work (João Garrido and Milho Branco)
June 12, 2009	Methods for arrangement and analysis of information on the plan, evaluation

Second Training

Date: February 8~10, 2010

Participants: 7extension officers of the agricultural local office and 3 ETER staffs of DGASP

Participants studied integrated and sustainable developing management of the watersheds. The training contents are described below:

Table 6.14.3 Schedule for the Training Course (Day 2)

Date	Training Contents
February 8, 2010	Notion of watershed areas, environmental management and planning, roles of facilitators related to natural resources management of the targeted watershed
February 9, 2010	Discussion and presentation of the experiences of the Pilot Project on the processing and distribution of agricultural produce Discussion on the issues around environmental plan in the watershed
February 10, 2010	The roles of facilitators on the management of sustainable and integrated development in the watershed

Following the presentation and discussion on the floor, participants analyzed management of watershed and the role of rural facilitators. Also, most of the participants acknowledged that the lack of measures in the field represents the vulnerability of rural promotion system in CV. Evaluation of the session was conducted at the end of the day. Trainees positively evaluated the project enhanced their capacity for the management of watershed.

6.14.3 Evaluation

(1) Verification of Achievement

- Manual for agricultural technology was drawn up.
- Training for the extension officers was implemented twice, contributing to the capacity building of extension officers.

(2) Verification of Implementation Process

- Manual for agricultural technology was compiled taking into consideration the opinions of all the actors involved including farmers.

- In implementing the training for extension officers, participated farmers gave presentation on the experiences of the projects for processing and distributing agricultural produce, contributing to the training for extension officers.

(3) Evaluation Result by Five Evaluation Criteria

The evaluation result of this component by five evaluation criteria is as follows:

Relevance

- It is essential to extend agricultural activities for promotion, corresponding to the needs of farmers. However, capacity building of extension officers shall be required, as knowledge of responsible officers is limited at this moment.
- Also, this project is placed at higher priority in PEDA, which is the superior plan of this project.

Effectiveness

- Extension officers and functionaries of ETER were in charge of drawing up the manual for extension of agricultural activities, and understood the technical knowledge through the training. Also, they thoroughly acquired the participatory methods in the trainings.
- In the second training, the Agricultural Local Office, which considered the training useful in the initial session, doubled the number of trainees so that they could enhance the instruction of farmers.

Efficiency

- Before the training of extension officers, they lacked activeness in observing attitudes of them. However, the effects by the training have gradually come out after receiving the training. It has become the driving force for smooth implementation of the project.
- Training for extension officers in this development study was completed on schedule, and contributed to capacity building of extension officers by inputting them to the projects.

Impact

- The Agricultural Local Office doubled the number of trainees, and they were motivated to disseminate their experiences to the rural villages.

Sustainability

- The central government expressed its will to continue this project component.
- Some of the participants are actively communicating with rural farmers to the extent that they continued activities even in Saturdays.
- The Agricultural Local Office announced the will to let extension officers conduct trainings for farmers.

6.14.4 Conclusion

Confirmation of Hypothesis

Hypothesis 1: Extension officers developed their skills in the technical knowledge.

Hypothesis 2: Extension officers acquired advanced knowledge on the community-based development and extension methods.

As for hypothesis 1, the study team conducted final evaluation after a half a month of training of extension officers and completion of technical manual for agriculture. Therefore, it could not spear sufficient time for verifying the hypothesis that extension officers acquired improved technical knowledge. However, as has been discussed in the items of effectiveness, trained extension officers actively employed lessons learned in the training in implementing the pilot project. As for the verification of improved technical knowledge, it is expected that the government of CV will verify it through the monitoring and evaluation.

Regarding the hypothesis 2 as well, the study team could not secure sufficient time to verify the project. However, participants seemed to acquire advanced information on participatory development techniques and extension methods.

Conclusion

As for the improvement of extension system, although the study team could not secure sufficient time to evaluate the project, it observed moderate effects. Also, some of the participants are actively communicating with rural farmers to the extent that they continued activities even in Saturdays.

This project is promoted by the supreme plan and is corresponding to the needs of farmers. Despite that agricultural services by means of extension system has not been practiced sufficiently, the study team positions this project as a high-priority Action Program. In the Action Program, the capacity building of extension officers by utilizing the manual elaborated in this action plan shall be focused on.

6.14.5 Lessons Learned and Reflection to the Action Plan

Table 6.14.4 Lessons Learned and Reflection to the Action Plan: Improvement of Extension System

Lessons Learned from Pilot Project Implementation	Reflection to Action Plan
• Positive interrelatedness among projects, such as trainings, agricultural processing, and marketing are observed to influence the success of the project. • Allowance for the funding and personals shall be taken into account in order to maintain improved consciousness for the promotion of agricultural development by implementing projects.	→ In order to create positive synergetic effects, the project should promote sharing of experiences. → Measures to emphasize the allowance for funding and personals should be articulated.

6.15 Extension of Pilot Project to Other Watersheds

The Action Plan elaborated in this study is not specifically applied to this model watershed of São Domingos, but it is applicable to other watersheds in Santiago Island. In order to expand the Action

Plan to other watersheds, it is prerequisite that the outcome, experiences and lessons learned derived from the implementation of Pilot Project of the Action Plan which effectiveness was confirmed shall be extended to rural residents in other watersheds.

In CV, ETER of DGASP, responsible department for rural extension, is in charge of confection of programs on agriculture and fisheries, and broadcast them on TV or through the radio. This project attempted to use these information programs to disseminate the contents of this project, the contents of implementation schedule and outcome, to entire people in CV.

Also, the extension seminar was organized to disseminate the contents of implemented pilot projects and its efficiency to farmers in other watersheds of Santiago Island.

Extension of the Projects through TV Programs

The study team prepared for the information programs with respect to the contents of the plan, components of the Action Plan, implementation schedule, and outcome of the project in August 2009. It provided and explained materials on the development plan and the components of the project to the responsible officers of ETER. At the same time, camera crews started to record the implementation conditions on the Pilot Project under construction. The program was completed in November, following through the editorial operation. The program was broadcasted at 19:40~20:00, on November the 30th and re-broadcasted on December the 7th.

It is difficult to estimate responses from audience, regarding the extension through TV programs. Some 40 percent of farmers, who participated in the Pilot Project, watched the program, when the study team surveyed the reputation for the participation of the Pilot Project along with the final evaluation. Most of the farmers who did not watch the program were habituated in the areas without electricity, or those households which do not possess TVs. Participants were interested to know that these projects were implemented by the assistance of Japan, and motivated to realize these projects in their communities.

Extension Seminar

This study team invited rural residents in other watersheds, after the final evaluation of the Pilot Project, and organized the seminar in February 2010 as follows.

Date: February 19

Participants: 31 farmers

7 watersheds (Ganxemba, Boa Estrada, Charco, Cumba, Pico Leão, and São João Baptista)/11 ACBs in the watershed of São Domingos (Baía, Prai Baixo, Achada Baleia, Praia Formosa, Portal, Achada Lama, Milho Branco, Lagoa, João Garrido, Aqua de Gato and Rui Vaz), 3 extension officers of the Agricultural Local Office, a functionary of DGASP, and a researcher of INIDA

Place: Agricultural Local Office in São Domingos

Purpose: To disseminate the outcome, experiences, lessons learned of the Pilot Project in this Study to farmers in other watersheds.

Process: The outline of this development project and 11 implemented projects are explained by facilitators. Following this, three pilot projects were selected and representatives of ACBs gave presentation with regards to the components, outcome, experiences and lessons learned from the projects. Presented projects were water-harvesting in Água de Gato, small-scale water resources development in Milho Branco and water saving irrigation/ water resources management in Achada Baleia.

Participants enthusiastically asked questions for the presentations. Most participants are particularly interested in the pitcher irrigation implemented as the water saving irrigation. The researcher in INIDA suggested that pitcher irrigation should be promoted, since the equipment for this method are available in CV, compared to drip irrigation, if better outcomes are obtained from the continuous experiments. Also, with respect to the questions whether water resources of the small-scale water resources development can be secured throughout a year, the answer was that the water resources would not be dried.

Regarding the questionnaires conducted at the end of the seminar, farmers from other watersheds showed interests in this Pilot Project, and wished to participate in the next ones. They articulated that this seminar was of use to know the blueprint of the next project.

In implementing this seminar, the study team asked external adviser to assist representatives of ACBs so that they could prepare for the presentations smoothly. Owing to the assistances; representatives of ACB gave presentation properly, which led the active discussion without getting tense. Efficiency of the extension seminar of the projects was confirmed.

Chapter 7 Action Plan

7.1 Elaboration of Final Action Plan

The Draft Action Plan was drawn up on São Domingos Watershed selected out of numerous watersheds in Santiago Island, as a model plan for watersheds of the Island. In elaborating the Final Action Plan, various small pilot projects from the action programs proposed in the Draft Action Plan have been implemented to assess the possibilities of realization of the projects, including technical feasibility and concrete development plan in the Watershed. In accordance with the lessons learned and experiences obtained through the implementation of pilot projects, the final Action Plan shall be drawn up.

The action programs to be proposed in the Final Action Plan shall be selected from the projects with high priority, since the programs were implemented and their priorities were assessed as pilot projects.

7.2 Priority Action Programs

Reflecting the lessons learned and experiences from the implementation of the pilot projects, the priority action programs were selected as follows. The Final Action Plan is to be drawn up with these priority action programs.

Soil and Water Conservation Project

As a result of implementation of the project, the study team verified technical effect and granted it as a priority project. It is noteworthy, however, that group leaders shall be trained through "Group Leaders Training Project" composing the Action Plan, taking in to consideration the special characteristics of ACBs as executing body that shows insufficient experience in independently initiated projects.

Agro-forestry Project

As a result of implementation of the project, the study team verified technical effect and granted it as a priority project. However, it shall be noted that exclusion of non ACB members hinders the effect of the project. Therefore, it is needed to form a system to involve them in the activities. Additionally, group leaders shall be trained through "Group Leaders Training Project" composing the Action Plan.

Water-spreading Project

As a result of executing the pilot project "Leaching of Salt Damaged Farm", the study team observed the technical effect of desalination of salt damaged farms by means of leaching with water-spreading technique and granted it as a priority project. Water-spreading is the technique proposed in the Small-scale Water Resources Development which catches a part of the river water in the time of flood and its technical feasibility was assessed in the project. Additionally, it was also assessed that the water-spreading technique enabled moistening of surrounding land and fertilization of soil. Hence, as a priority action program, project for the measures against salt

damaged farm shall be replaced with Water Spreading Project. In ZAE I, the Project aims not only to desalinate the salt damaged farm by leaching but also to moisten and fertilize lands. In ZAE II, it attempts to moisten and fertilize farm lands only.

Promotion of Water Saving Irrigation Project

As a result of executing the pilot project "Water Saving Irrigation/Water Management", the study team observed the technical effect and granted it as a priority project. Since, in the pilot project, both Introduction of Water Saving Irrigation and Water Saving Irrigation Training were implemented. Hence, as a priority action program, those two projects shall be integrated into Promotion of Water Saving Irrigation Project composed of Introduction of Water Saving Irrigation, Water Saving Irrigation Experimental Farm and Water Saving Irrigation Training.

Management of Livestock Farming Project

The result of execution of the pilot project 'Water-harvesting" showed that this project was not technically feasible, thereby the study team omitted it from the priority project. It should be noted, however, that effect of cultivation of pasture grass was verified in executing this pilot project. Considering the outcome obtained from the project, the study team set Management of Livestock Farming Project as a priority project, in order to cultivate pasture grass in fenced land and to prevent intrusion of livestock animals. This project shall be included in the final Action Plan, as a program which realizes a part of Management of Adequate Pasturage in the draft Action Plan.

Rationalization of Market Distribution Project

As a result of executing the pilot project 'Rationalization of Market Distribution", the study team verified a part of technical effect, and for the part which was not verified, the measures to attain the purpose was also confirmed. Therefore, it was granted as a priority project. Adding to this, implementation of this project has ensured the possibility of collaboration work among people in the targeted region. But the technical assistances from the administrative department shall be required, as this is a new trial, and improvement of knowledge of extension officers through "Group Leaders Training Project" composing the Action Plan shall be attempted.

Group Leaders Training Project

As a result of implementing the pilot project "Group Leaders Training", the effect of the trainees showing awareness for leadership was assessed. Since this project supplements smooth execution of other project, the study team situates this project as a high-priority project.

Extension among Farmers Project

As a result of executing the pilot project "Extension among Farmers", the study team observed trainees had motivated each other. Since the need of this project was big, the study team situates this project as a high-priority project.

Capacity Building of Extension Officers Project

The result of execution of the pilot project "Improvement of Extension System" confirmed the effect of this project and showed its necessity was big, thereby the study team decided to employ

this project as a priority project. Agricultural technical manual with respect to improvement of the extension system was elaborated in the project, as well. Therefore, as a priority project, the action program shall focus on the capacity building of extension officers by good use of the manual, and the program "Improvement of Extension System" shall be substituted to "Capacity Building of Extension Officers".

The followings are the programs which were not currently proposed as priority action programs.

Small-scale Water Resources Development Project

The study team executed in the Pilot Project both "Small-scale Water Resources Development" and "Water-harvesting' which were related to this project. As a result, the study team concluded that both the projects could not be priority projects and rejected them as programs of Action Plan currently, Yet, it should be noted that this project has possibility to be included in the component of Action Plan, if the visible achievement would be observed during the course of the continuous carrying out of the project by the Government of CV.

Processing of Agricultural Produce Project

As a result of implementing the pilot project "Processing of Agricultural Produce", the study team concluded that the priority of this project was rather low and rejected it as a program of the Action Plan currently. However, CV places that the promotion of agricultural produce processing is very important, as there are many losses of the agricultural produce at the season in CV. At present, as the experienced experts in this field are few in CV, CV has the idea to request the assistance which contributes to this field to JICA or the International Organization. This project will be included in the Action Plan at the time when CV will be able to implement it.

Capacity Building and Awareness Creation of Community Project

With respect to implementing action programs composing the Action Plan, it shall rather target at farmers associations than at the communities. Therefore, the study team prioritizes farmers associations and farmers, instead of encouraging communities. Also, this project was neither selected nor implemented as a pilot project, thereby not verified. Therefore, the study team omitted this project from the Action Plan. It will be considered as a program to be included in the Action Plan when the necessity of this project will be realized by the government of CV.

Process from the elaboration of Draft Action Programs, through the implementation of Pilot Project and till the selection of the Priority Action Programs is shown in the figure next page.

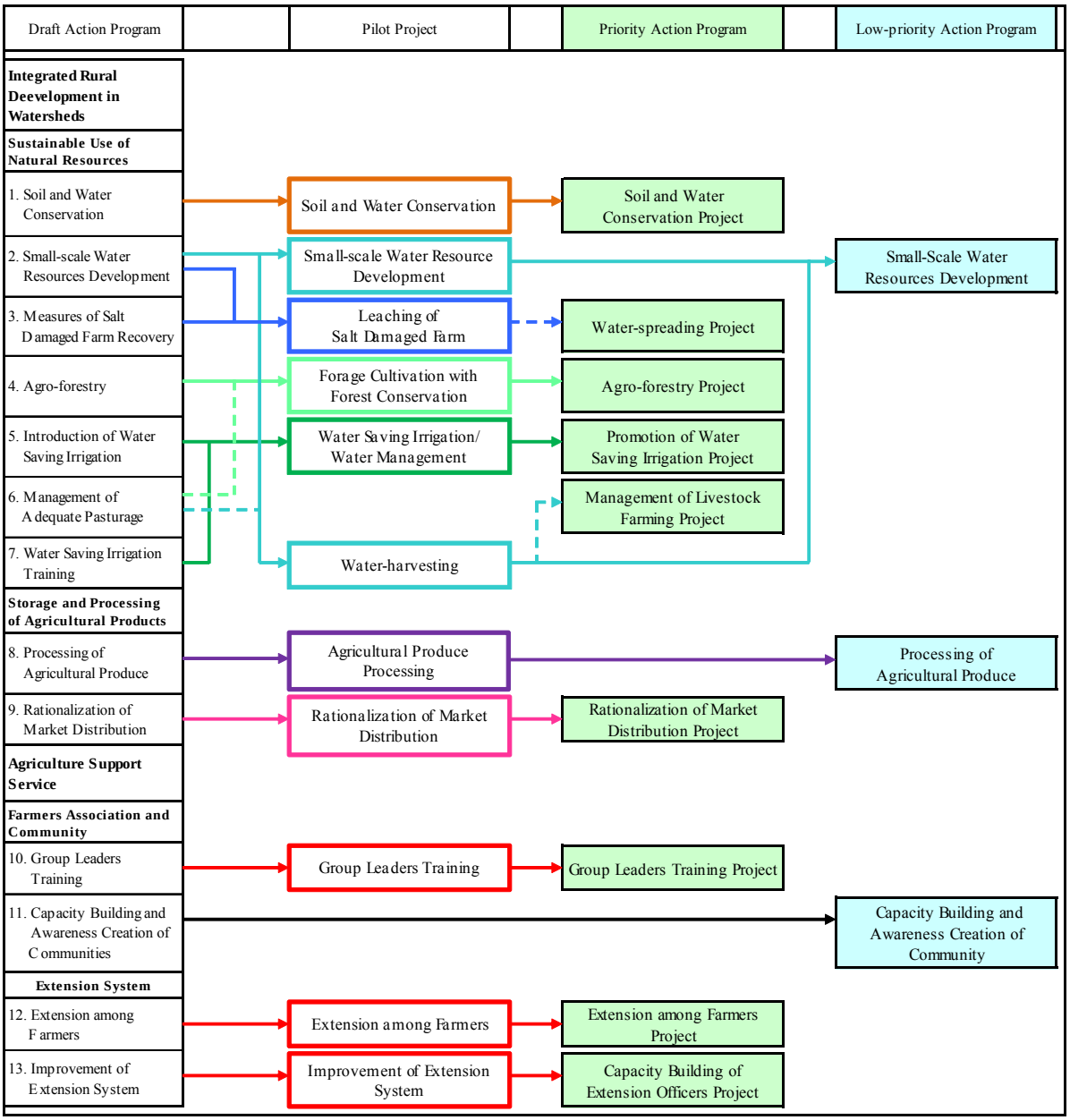


Figure 7.2.1 Process towards Priority Action Programs

7.3 Action Plan

As mentioned above, 13 draft action programs were integrated into 9 priority action programs. These projects were confirmed through implementing the Pilot Project, and are applicable to other watersheds.

7.3.1 Model 1: Natural Resources (Especially Water) Management Model, a Watershed as a Unit, Applicable to Other Watersheds

This model focuses on the sustainable use of limited resources, chiefly both the lack of agricultural water caused by limited rainfall, and the lack of agricultural lands due to steep landscape. The project is composed of 7 programs discussed below among the priority action programs, excluding "Management of Livestock Farming Project" and "Rationalization of Market Distribution

Project". The projects shall be implemented in each unit of watersheds.

(1) Soil and Water Conservation Project

Although numbers of projects for the soil and water conservation have been implemented in CV, fruit cultivation using conservation works has not been tried frequently. Rural residents shall become motivated for this project and become conscious for the integrated management of the natural resources by cultivating fruit trees and constructing conservation works. Also, this project should be implemented as a national project, in terms of the conservation of lands and biology. Therefore, while the government of CV is responsible for the budget of the project, farmers shall be in charge of cost for planting fruit trees and for watering lands in order to nurture ownership for this project.

This project shall implement fruit cultivation by means of conservation works in ZAE III and IV. This project shall employ stone masonry works and crescent filling works, as had been employed and considered appropriate in the Pilot Project. With regard to the cultivated fruits, this study will adopt papayas and azalea for suitable varieties, as had been employed in the Pilot Project.

The scale of the facilities shall be 2.7 ha, considering the capacity of ACBs observed in the pilot project. They are responsible for watering the lands in the dry season until when the fruit trees take route. Also, in cultivating beans as well as fruit trees, farmers should pay attention to the bean vines twining around the trees so that they do not entangle with each other, when they are nursery plants.

(2) Agro-forestry Project

Communities surrounding the protected forests are responsible for managing them in the upstream of watersheds. However, weeds and scrubs, mainly consisted of variety of beans, not applicable as forages, are covering the bottom of the trees without being treated properly.

Agro-forestry project aims both to conserve protected forestry and to produce forages, by cleaning weeds and scrub bushes which cause the destruction of the forestry, and by sawing seeds of several annual pastures. Rural residents shall be motivated to maintain protected trees, since they can practice forage cropping in the protected trees where food cropping is prohibited. While the government of CV is responsible for the budget of the project in terms of the protection of forest, farmers shall pay for the cost for seeds of pasture grass.

This project shall be implemented in ZAE IV. Estimated targeted area is 2.7 ha, considering the capacity of ACBs observed in the pilot project. Also, during the Pilot Project, matured pastures were stolen before the cultivation, which did not lead the increase in the income of ACBs. Since tight cooperation with guardians will be required to prevent the illegal harvesting, the project shall hold workshops including people concerned. Since the illegal cropping was conducted by rural residents other than ACBs, they shall be included in the workshops.

(3) Water-spreading Project

In ZAE I and III of the downstream areas, the precipitation is limited even in the rainy seasons. Rainfall in the upstream of the rivers effluents to the ocean, without moistening agricultural areas in the downstream, once it flows into the river. Hence, this project attempts to catch part of the river

water during the flood, most of which becomes ineffective outflow, and to moisten lands around the river, in order to replenish the agricultural water in the downstream area. It also expects the fertilization of the lands by inflow of river water in floods. Moreover, in ZAE I, this project aims at the desalination of lands by leaching, to lead river water onto the salt damaged lands.

In the Pilot Project, a new diversion dike was constructed as facilities to catch the surface water during the floods. However, this project shall consider renovation of the existing small dams to catch river water for the purpose of curbing the increased cost for construction, which can greatly reduce the cost of the project. With regard to the renovation of the facilities, the intake works for diverting the flow which overflows the dike and headrace channels to the targeted lands shall be newly constructed. Earth canals shall be adopted as headrace channels, since they are used at flood time and the water loss of conveyance is not needed to consider. The government of CV takes responsibility for the cost for construction, and farmers are responsible for cost of pasture seeds.

Targeted area shall be set as 1.0 ha at maximum in each ZAE from the experiences of the pilot project. If the depth of inundation is estimated as 100 mm, required volume of water shall be 1000 m^3. Considering that the floods continue 2.0 hours on average, and that setting maximum velocity of flow of the earth canals is as 0.6 m/s, required section of canals shall be 0.27 m^2, taking freeboard into account.

(4) Promotion of Water Saving Irrigation Project

As has been mentioned before, agricultural water is scarce due to the limited precipitation in Santiago Island. Limited water resources are inhibiting the promotion of irrigative agriculture. On the other hand, as for the irrigation methods, small basin irrigation and surface irrigation (traditional irrigation), such as small furrow irrigation, are mainstream, yet represent low irrigation efficiency. Moreover, water resources for irrigation are not efficiently used. In the midst of this circumstance, the government of CV attempts to implement policy for the promotion of water saving irrigation (e.g. drip irrigation), which shows high irrigation efficiency.

In CV, 55 m^3/ day (5.5 mm/day) for 1 ha is required for the traditional irrigation, while 35 m^3/day (3.5 mm/day) is required for 1 ha in the drip irrigation. By the traditional irrigation to the traditional irrigation, farmers can irrigate 1.57 times as much as lands with the same volume of water as the traditional irrigation. Taking São Domingos Watershed for example, irrigative area amounts to 100 ha, among which the drip irrigation is implemented in 15 ha. By transforming all 75 ha of the traditional irrigative areas into the drip irrigation areas, some 40 ha of lands can be irrigated. In the Pilot Project, the project has confirmed that it can gain improved water saving efficiency by introducing mulching.

As has been discussed above, introduction of water saving irrigation enhances irrigation farm widely, despite the limited water resources. Therefore, this measure can be efficient to supplement the lack of irrigation water in CV, without relying on the water resources development which might require large amount of cost.

It was confirmed through the implementation of the Pilot Project that the drip irrigation had the effect not only on water saving but also on cost saving. On the other hand, concerning the pitcher irrigation, it was found that its effect on water saving was nearly as same as that of the drip irrigation,

but its cost performance was worse than that of the traditional irrigation. Consequently, only the drip irrigation was included in this project. Concerning the pitcher irrigation, as it has the advantage in locally available equipment and its simple method, including how to reduce its cost, its future introduction shall be continuously examined in the course of the water saving experiment.

On the other hand, it is not long since CV introduced the water saving irrigation, and its basic data are not available at this stage. Therefore, experiments for its data collection are required. In the Pilot Project, this study team set up the experimental farm to launch study for the water saving irrigation. However, due to the fact that the experiment had been implemented only once in one cultivation, continuous experiments shall be desired to collect reliable data, and to establish the basement of water saving irrigation in CV,. Additionally, it is inevitable to carry out the capacity building trainings of extension officers who introduce the water saving irrigation and operate/maintain the experimental farm, and of farmers to acquire knowledge on the water saving irrigation.

This project 1) replaces traditional irrigation, which is using spring water and is being implemented in ZAE III, with drip irrigation, and 2) practice drip irrigation to convey water to the downstream areas where farmers are forced to practice the rain-fed agriculture because of the lack of irrigative water. Targeted areas for replacing traditional to drip irrigation are set at 2 ha, the excess water being 40 m^3. This excess water shall be supplied to the lands at 1 km down the river, and φ63 of the pipes are laid down. Areas for the drip irrigation are 2 ha in the upstream of the rivers and 1 ha in the downstream for each. With regard to the facilities, other than equipment of drip irrigation and pipelines, collection pits in the upstream and regulating pits will be required. Also, in ZAE I and II, this project will enlarge the irrigation area by implementing drip irrigation in 2 ha of lands in each ZAE. The Government of CV shall take introduction cost of irrigation facilities in terms of extension of irrigation lands and sustainable use of water at national level.

As for the experimental water saving irrigation farm, this project continuously studies water saving irrigation for the time being in the experimental farm which was set during the Pilot Project in Achada Baleia. Feasibility of introduction of pitcher irrigation shall be studied as well. CV shall assess the importance of the experimental farms in other watershed of Santiago Island, at the point where the data will have been collected to some extent. If it is necessary, it will advance the experiments in other watersheds. Therefore, this action plan does not intend to set up a new experimental farm, remaining experiments in the experimental farm in Achada Baleia.

As for the training for water saving irrigation, this project shall organize the trainings twice during the Action Plan in each watershed (The first stage: five days in total when two days are allocated for extension officers, and three days for both extension officers and farmers; The second stage: three days in total, and one day is allocated to extension officers exclusively and two days are allocated for extension officers and farmers). Also, extension officers who are in charge of the operation of experimental farm shall be trained to enhance the management system, since they only have limited knowledge of experiments.

(5) Group Leaders Training Project

Capacity of the group leaders depends on the success and failures in the group activities. Since

most of the projects in this Action Plan are mainly implemented by ACBs, this project shall conduct trainings for group leaders. When the project was implemented as a component of Pilot Project, participants considered the trainings as efficient, and counterparts positively evaluated the efficacy of this project and expressed its will to continue the project. Especially, group leaders' conferences, which had been the first trial in CV, were highly appreciated. Leaders exchanged information and ideas, which cultivated the motivation of leaders for the group activities.

This project shall be categorized as an agricultural support programs by the government to implement the Action Plan, and shall be executed in the entire watershed accordingly. The contents of this training is as follows: 1) basic items related to group activities (necessity of rules, selection of leaders, qualifications of the good groups, roles of leaders), 2) accounting and commodity management (definition for accounting, roles of accounting documents, cash journal, expense sheets, notes for commodity management, and reports), 3) importance of meetings and minutes of meeting, and 4) projects (project formation and implementation) as group activities. Training for leaders shall be implemented twice in each of the watershed area during the Action Plan (The first session: four days: the second session: two days). Group leader conferences shall be held in every four months.

Also, this project plans to organize seminars for the extension/ advertisement of their activities in this Action Plan to other watersheds by concerned group leaders. In selecting the watersheds where farmers took part in the seminars, the next planned implementation areas shall be considered with referral to the overall project flow.

(6) Extension among Farmers Project

In order to mobilize farmers to join rural development, it is required to motivate them. In addressing the issue, it is important to let them understand what kind of fruit of the project they can enjoy by engaging rural development. One of the possible measures is to invite candidates who possibly participate in the rural development to advanced agricultural areas in order to introduce new agricultural technology. In this project, the possibility for improved agricultural productivity shall be confirmed by introducing advanced agricultural techniques, exchanging knowledge, experiences and opinions with farmers in the targeted region. As a result, farmers who visited the advanced region have become invigorated to practice more advanced agriculture for improved productivity. In the end, this project can improve motivation to participate in their rural development.

The study team observed the effects described above during the implementation of the Pilot Project. Moreover, trained ACBs extended the outcomes acquired from the training to ACB members who have not joined the field visit. Reflecting the lessons learned in the pilot project, the study team drew up following schedule targeting at each of the watersheds: set up of the tour; and organization of meting sessions (four days shall be allocated to each of the activities in the four zones).

This project is the agricultural support program by the government in order to implement action plan smoothly, and shall be executed in entire watershed.

(7) Capacity Building of Extension Officers Project

Success of this Action Plan depends on the capacity of the extension officers. Elaboration of the

extension manual was completed in the Pilot Project. The manual was composed of 1) soil, 2) water saving irrigation/water management, 3) livestock breeding, 4) agro-forestry, 5) environmental conservation, 6) community associations and rural development.

This project shall conduct trainings for extension officers by utilizing the manual in order to successfully implement this Action Plan. This project focuses on the participatory approach, since most of the projects are executed by ACBs. Also, trainings for management of watersheds and environment shall be organized. In addition to this, in the initial implementation phase, the lectures to make rural residents understood shall be organized for smooth implementation of the Action Plan. The training for extension officers will be organized twice (the first session: 5 days; the second session: 3 days) in each of the watersheds.

This is the government led agricultural support program to implement the Action Plan, and will apply to the entire watershed.

As has been seen above, the study team defined the model 1 as a project for the sustainable use of natural resources, chiefly water management per unit of the watershed with 7 projects mentioned above. (The model of use of natural resources is described in the frontispiece "Conceptual Image of Action Plan - Model of Utilization of Natural Resources by Watershed".)

In the upstream of watershed, this project shall implement "Soil and Water Conservation Project" to realize conservation of national lands and the maintenance of ecosystem. This project shall prevent the soil erosion on the steep slopes due to the rainfall, expands the arable lands, and cultivates the ground water. Also, it will implement "Agro-forestry Project" in order to conserve forests as watershed protected forests and to prevent national lands. The project can predict the increase in the volume of spring water.

In the place where spring water can be found, the project shall introduce drip irrigation, as "Promotion of Water Saving Irrigation Project" to convey the supplementary water to the downstream, and to augment the irrigative area. Also, as for the introduction of water saving irrigation, this project shall consider appropriate methods by means of the outcome of experiments continuously executed in the experimental water saving irrigation farm.

In the downstream area where precipitation is limited, "Water-spreading Project" attempts to catch part of the river water of flood by the rainfall in the upstream, introduce it to the surrounding lands, and cultivate forages. In the most downstream area, the water is used in order to restore the agricultural lands to desalinate the salt damaged lands.

In implementing the Action Program, the government should execute the agricultural support programs. Since the trainings of ACB leaders and capacity building of extension officers who support the implementation are required, "Group Leaders Training Project" and "Capacity Building of Extension Officers Project" support them, and smooth progress of the Action Plan will be realized. Additionally, "Extension among Farmers Project" is planned to motivate the executing farmers for participating in the Action Plan. Also, concerning the water saving irrigation, the water saving irrigation trainings will be carried out for the responsible extension officers and farmers engaged in the drip irrigation.

7.3.2 Model 2: Model of Integrated Rural Development for Each Zone of Agro-Ecology (ZAE) Applicable to Other Watersheds

This model aims at development of the integrated rural development in each ZAE to contribute to increase in agro-economy.

ZAE I

Integrated rural development project in ZAE I is composed of six priority action programs below.

(1) Water-spreading Project

In ZAE I, the project aims to lead the flood water to the salt damaged lands for the purpose of desalinating by leaching. Detail information is discussed in model 1.

(2) Promotion of Water Saving Irrigation Project

In ZAE I, irrigated area shall be enlarged by introducing the drip irrigation system. For the introduction, the outcome of water saving irrigation experiments carried out in Achada Baleia shall be used. In addition, the water saving irrigation trainings for farmers who are engaged in drip irrigation shall be planed. Detail information is discussed in model 1.

(3) Rationalization of Market Distribution Project

Selling of tomatoes by collective marketing is executed at the pilot project in CV where sales of the agricultural produce in collaboration had never been tried. Consequently, farmers were motivated since the project confirmed the decrease in the cost for sales.

In the Pilot Project, participants were divided into the group of collective marketing and the individual marketing, and the outcome was compared and verified. Since the collective marketing reduced the cost for sales, this project shall only employ the cooperative collection and shipment.

In implementing the project, workshops shall be organized to conduct the educational activities to the participated groups. Counterparts, who had participated in the pilot project and had understood the contents and its efficacy, shall facilitate the workshops. Farmers who have experienced the project shall explain the progress and efficacy of the cooperative marketing. The project shall be targeted at one ACB a year in ZAE I.

(4) Group Leaders Training Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE I but also in the entire watershed. Detail information is discussed in model 1.

(5) Extension among Farmers Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE I but also in the entire watershed. Detail information is discussed in model 1.

(6) Capacity Building of Extension Officers Project

This project is the agricultural support program by the government, and shall be executed not

only in ZAE I but also in the entire watershed. Detail information is discussed in model 1.

In ZAE I, "Water-spreading Project" leads the flood water to the salt damaged lands for the purpose of restoring the lands with desalination by leaching. Introduction of drip irrigation aims to augment the irrigation areas. Their implementation increases the agricultural production. With regard to the cultivated agricultural produce, "Rationalization of Market Distribution Project" enables the decrease in the farmer's expenses alleviating the shipping cost. This practice is expected to lead the increased bargaining power by the large shipment in future.

Thus, increase in agricultural produce and control of managing cost will profit agro-economy and bring about realization of increase in living standard. Additionally, as agricultural support programs by the Government, "Group Leaders Training Project", "Extension among Farmers Project", "Capacity Building of Extension Officers Project" and Water Saving Irrigation Training are to be carried out for smooth implementation of the Action Plan.

ZAE II

Integrated rural development project in ZAE II is composed of seven priority action programs below.

(1) Water-spreading Project

In ZAE II, the project aims to lead the flood water to the surrounding lands for the purpose of fertilizing the land. Detail information is discussed in model 1.

(2) Promotion of Water Saving Irrigation Project

In ZAE II, irrigated area shall be enlarged by introducing the drip irrigation system. For the introduction, the outcome of water saving irrigation experiments carried out in Achada Baleia shall be used. In addition, the water saving irrigation trainings for farmers who are engaged in drip irrigation shall be planed. Detail information is discussed in model 1.

(3) Management of Livestock Farming Project

In Santiago Island, due to the limited and precarious rainfall, it is difficult for farmers to produce sufficient forage. Adding to this, excessive livestock breeding ignoring economic efficiency and damage to agricultural produce and forestry caused by extensive farming, bring about devastation of pasture lands, which leads to chronicle lack of pasture grass.

As a result of cultivation of pasture lands during the pilot project of 'Water-harvesting' in ZAE II, the feasibility of cultivation of pasture in enclosed land to prevent intrusion of livestock animals was verified. Considering the natural conditions of each zone, this project is not feasible to implement in ZAE I, III and IV, because of the limited volume of rainfall in ZAE I and steep landscape in ZAE III and IV. Therefore, ZAE II was selected for planning this project, since large pasture lands can be obtained only in this area.

Reflecting the lessons learned in the pilot project, the targeted area shall be 3.0 ha for the plan.

(4) Rationalization of Market Distribution Project

This project will be implemented in ZAE II, where one ACB shall be targeted a year. Detail information is discussed in the ZAE I.

(5) Group Leaders Training Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE II but also in the entire watershed. Detail information is discussed in model 1.

(6) Extension among Farmers Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE II but also in the entire watershed. Detail information is discussed in model 1.

(7) Capacity Building of Extension Officers Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE II but also in the entire watershed. Detail information is discussed in model 1.

In ZAE II, "Water-spreading Project" leads the flood water to the surrounding area for the purpose of cultivating pasture grass. Introduction of drip irrigation aims to augment the irrigation areas. "Management of Livestock Farming Project" realizes the promotion of livestock farming with the increase in pasture grass. Their implementation increases the agricultural production. With regard to the cultivated agricultural produce, "Rationalization of Market Distribution Project" enables the decrease in the farmer's expenses alleviating the shipping cost. This practice is expected to lead the increased bargaining power by the large shipment in future.

Thus, increase in agricultural produce and control of managing cost will profit agro-economy and bring about realization of increase in living standard. Additionally, as agricultural support programs by the Government, "Group Leaders Training Project", "Extension among Farmers Project", "Capacity Building of Extension Officers Project" and Water Saving Irrigation Training are to be carried out for smooth implementation of the Action Plan.

ZAE III

Integrated rural development project in ZAE III is composed of six priority action programs below.

(1) Soil and Water Conservation Project

This project will be implemented in ZAE III. Detail information is discussed in model 1.

(2) Promotion of Water Saving Irrigation Project

In ZAE III, introduction of drip irrigation augment irrigation lands in the downstream convey excess water to the downstream. For the introduction, the outcome of water saving irrigation experiments carried out in Achada Baleia shall be used. In addition, the water saving irrigation trainings for farmers who are engaged in drip irrigation shall be planed. Detail information is

discussed in model 1.

(3) Rationalization of Market Distribution Project

This project will be implemented in ZAE III, where one ACB shall be targeted a year. Detail information is discussed in ZAE I.

(4) Group Leaders Training Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE III but also in the entire watershed. Detail information is discussed in model 1.

(5) Extension among Farmers Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE III but also in the entire watershed. Detail information is discussed in model 1.

(6) Capacity Building of Extension Officers Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE III but also in the entire watershed. Detail information is discussed in model 1.

In ZAE III, "Soil and Water Conservation Project" shall be executed to conserve national lands and maintain ecosystem. This project attempts to prevent soil erosion on the steep slopes due to strong rainfall, to extend the cultivate area and to contribute to the recharge of the groundwater. Thus, the increase in the volume of spring water is expected in the downstream area. Combination of fruit cultivation shall generate income out of the sales of fruits. In the area with spring water, drip irrigation shall be introduced to convey excess water to the downstream area to augment the drip irrigation area, as a promotion of water saving irrigation. Thus the increase in the agricultural produce is expected. With regard to the cultivated agricultural produce, "Rationalization of Market Distribution Project" enables the decrease in the farmer's expenses alleviating the shipping cost. This practice is expected to lead the increased bargaining power by the large shipment in future.

Thus, increase in agricultural produce and control of managing cost will profit agro-economy and bring about realization of increase in living standard. Additionally, as agricultural support programs by the Government, "Group Leaders Training Project", "Extension among Farmers Project", "Capacity Building of Extension Officers Project" and Water Saving Irrigation Training are to be carried out for smooth implementation of the Action Plan.

ZAE IV

Integrated rural development project in ZAE IV is composed of six priority action programs below.

(1) Soil and Water Conservation

This project will be implemented in ZAE IV. Detail information is discussed in model 1.

(2) Agro-forestry Project

This project will be implemented in the protected forests in ZAE IV. Detail information is discussed in model 1.

(3) Rationalization of Market Distribution Project

This project will be implemented in ZAE IV, where one ACB shall be targeted a year. Detail information is discussed in ZAE I.

(7) Group Leaders Training Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE IV but also in the entire watershed. Detail information is discussed in model 1.

(8) Extension among Farmers Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE IV but also in the entire watershed. Detail information is discussed in model 1.

(9) Capacity Building of Extension Officers Project

This project is the agricultural support program by the government, and shall be executed not only in ZAE IV but also in the entire watershed. Detail information is discussed in model 1.

In ZAE IV, "Soil and Water Conservation Project" shall be executed to conserve national lands and maintain ecosystem. This project attempts to prevent soil erosion on the steep slopes due to strong rainfall, to extend the cultivate area and to contribute to the recharge of the groundwater. Combination of fruit cultivation shall generate income out of the sales of fruits. Also, "Agro-forestry Project" shall be implemented in the protected forests to conserve recharging forests and to prevent the devastation of national land. It enables the production of forage crops. Thus, the increase in the volume of spring water is expected in the downstream area. With regard to the cultivated agricultural produce, "Rationalization of Market Distribution Project" enables the decrease in the farmer's expenses alleviating the shipping cost. This practice is expected to lead the increased bargaining power by the large shipment in future.

Thus, increase in agricultural produce and control of managing cost will profit agro-economy and bring about realization of increase in living standard. Additionally, as agricultural support programs by the Government, "Group Leaders Training Project", "Extension among Farmers Project" and "Capacity Building of Extension Officers Project" are to be carried out for smooth implementation of the Action Plan.

The model of integrated rural development is described in the frontispiece "Conceptual Image of Action Plan - Model of Integrated Rural Development for (each ZAE) of Watershed".

7.3.3 Implementation Plan of Action Plan

Implementation Plan of the Action Plan shall be elaborated as an entire plan in one watershed,

considering the watershed as one unit, integrating the Model 1 and Model 2 which are the fundamental elements of the Action Plan. Since it might be unrealistic to draw up the Plan for all the watersheds in Santiago Island considering there are more than 100 watersheds, this Action Plan shall be drawn up in eight watersheds for five years.

(1) Implementation Schedule

The Action Plan shall be implemented according to the following procedure.

- Securement of Financial Resources

DGASP shall implement the Action Plan in two watersheds every year and secure financial resources for their implementation. If it is difficult to implement them by his own budget, assistance from external donors, chiefly international aid organizations and NGOs, shall be sought. Counterpart fund of food assistance by the Government of Japan shall be considered as effective financial resources. Since each of the action programs proposed in this Action Plan is operative, requesting the assistances for each of the individual programs shall considered taking it into account to keep the implementing cost low and to make the securement of the budget easy. DGASP shall secure the budget for relatively small-scale projects, which will be allocated from MADRRM.

- Selection of Target Watersheds and Elaboration of General Plan

DGASP shall select 2 target watersheds a year for implementing the Action Plan. For the selection, 10 watersheds which were the candidates for selecting the model watershed of the Draft Action Plan take priority, but current conditions of the watersheds shall be taken into account. In implementing the Water-spreading Project, it is required to confirm the existence of existing weirs in selecting the target watersheds. The general plan for implementing the Action Plan in the target watersheds selected shall be designed in accordance with the following procedure.

- Commencement of Extension Officers Training

Extension officers training shall be carried out in order to improve their awareness toward the Action Plan and to attempt the smooth implementation and success of the Plan, since the extension officers in the Agricultural Local Offices shall play key roles for implementing the Plan. The extension officers training shall be conducted along the line with the "Capacity Building of Extension Officers Project" in the Action Plan. The second session shall be implemented after a year of launching the Action Plan.

- Agreement with ACBs

In the target watersheds, workshops shall be held to select ACBs responsible for the implementation of the Action Programs. DGASP will be in charge of holding workshops for ACBs in cooperation with the trained extension officers. Eligible ACBs for implementing each program shall be selected in the workshops, and agreement with all the ACBs in the target watersheds shall be made.

- Elaboration of Detailed Plan

Responsible extension officers shall elaborate the detailed plans in implementing each action

program, assisted by DGASP, taking ideas of ACBs who carry out the program into account. In designing the plan, it is required to assess the natural conditions in the target watersheds and design it according to the result.

With respect to the varieties of fruit trees to be introduced in the "Soil and Water Conservation Project", the suitability of papayas and azalea proposed in the Project shall be confirmed and potentials of other fruit trees shall be examined. The flexible plan shall be considered for deciding the implementing areas in accordance with the current circumstances.

As for the "Agro-forestry Project", the project shall select forage crops easily available and suitable for the target watersheds. The flexible plan shall be considered for deciding the implementing areas in accordance with the current circumstances.

In the "Water-spreading Project", it is required to check the locations of existing weirs and target farm lands for deciding the length of ditches. Since size of the target farm is varies with the current conditions, sectional area of canal is required to be adjusted to it.

Regarding the "Promotion of Water Saving Irrigation Project", size of the farm changing over from the traditional irrigation to drip irrigation shall be planned in accordance with the current situation. This project shall incorporate mulching, if experiments of the water saving irrigation represent favorable outcome.

It is important to introduce other vegetables, such as green peppers, carrots and onions which are grown in the target watersheds, other than tomatoes, as for the "Rationalization of Market Distribution Project".

- Commencement of Group Leaders Training

Since these Action Programs are implemented by ACBs, success of the projects depends on the capacity of leaders. Therefore, in implementing the Action Programs, group leaders training shall be carried out to prepare for themselves to lead the projects successful. The trainings will be executed as a part of the "Group Leaders Training Project" in the Action Plan. In parallel with the implementation of the Programs, group leaders meetings shall be hold.

- Implementation of Action Programs

Following the elaborated detailed implementation plan, ACBs shall implement the programs, assisted by the extension officers and DGASP according to the contents of the Action Programs. With respect to the projects which require construction of facilities, such as soil and water conservation, and so forth, the facilities shall be constructed, in accordance with the procedure needed for the construction (designing, bidding documents, procurement of contractors and construction), and then the Programs shall be commenced.

Most of the facilities in this Action Programs are small-scale and simple. Therefore, staff of DGASP and extension officers are responsible for designing of the facilities and execution of bidding. The project shall seek fair competitive bidding in selecting contractors. In constructing facilities, extension officers are in charge of supervising the construction and completion of the appropriate facilities, assisted by DGASP.

- Monitoring and Evaluation

  The staff of DGASP and extension officers shall monitor the implementation of the Action Programs and provide the commissioned ACBs with the outcome to secure smooth progress. At the end of each project, final evaluation shall be conducted, and the result of the evaluation shall be used for more efficient implementation of the Action Plan in other watersheds, reflecting them to their implementation.

The implementation schedule in unit of watershed in accordance with the procedure above mentioned is attached at the end of this chapter. Also, the following is the general implementation schedule for five years.

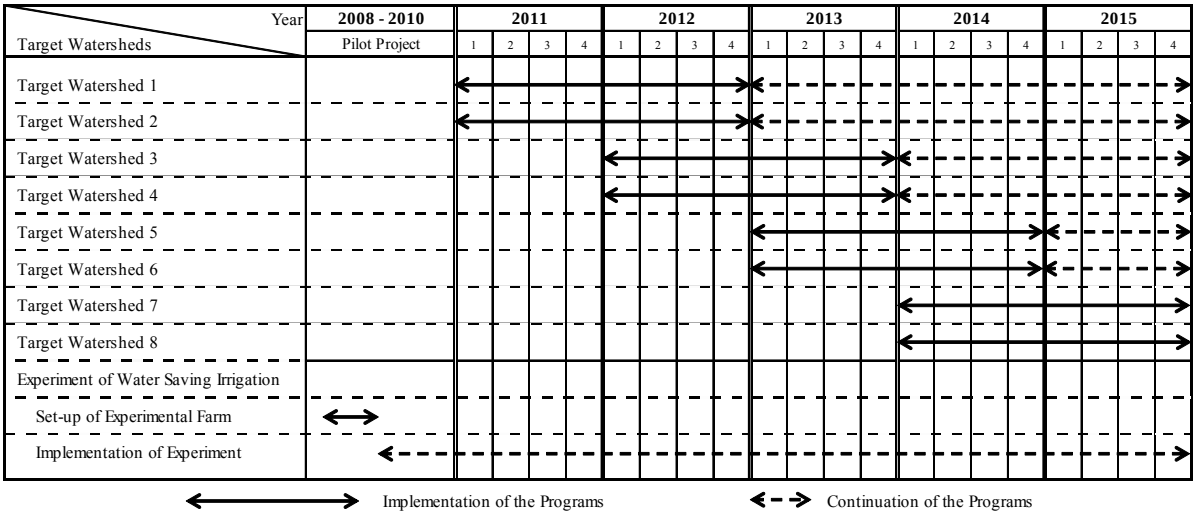


Figure 7.3.1 General Implementation Schedule

(2) Estimated Cost

Application of the Action Plan to the watersheds in Santiago Island shall be done taking into consideration the conditions of each target watershed, since their natural conditions are different and the designing of the facilities shall be done in accordance with such conditions. Therefore, since the estimated cost shall be variable per watershed, the cost of the Action Plan shall be roughly estimated and shown in the following table.

The government of Cape Verde shall prepare the budget for implementation of the Action Plan, since the Plan is composed of the programs aiming at prevention of land devastation, efficient use of water resources and enlargement of irrigation land. However, the farmers shall be responsible for purchase cost of seeds in order to develop their ownership for this project.

The cost of the Action Plan estimated in unit of watershed amounts to €175,867.-. Since the Plan will be implemented in two watersheds a year, the annual cost for the Plan amounts to €351,734.-. however, the total annual cost amounts to €368,022.-, adding €16,288.- of annual operating cost for continuous operation of the water saving irrigation experiment. Therefore, the total cost for the five years Plan amounts €1,488,000.-. (€368,022 x 4 years + €16,228 x 1 year).

Table 7.3.1 Estimated Cost for the Projects per Unit of Watershed Area

Action Program	Project Cost (ECV)	Project Cost (€)	Remarks
ZAEI			
Water-spreading Project	339,000	3,074.41	Catchment Works, Earth Canal (L = 1 km, A = 0.27 m^2)
Promotion of Water Saving Irrigation Project	3,312,000	30,036.73	Equipments of Drip Irrigation (3 ha)
Rationalization of Market Distribution Project	166,000	1,505.46	
Total	**3,817,000**	**34,616.61**	
ZAEII			
Water-spreading Project	339,000	3,074.41	Catchment Works, Earth Canal (L = 1 km, A = 0.27 m^2)
Promotion of Water Saving Irrigation Project	3,312,000	30,036.73	Equipments of Drip Irrigation (3 ha)
Management of Livestock Farming Project	657,000	5,958.37	
Rationalization of Market Distribution Project	166,000	1,505.46	
Total	**4,474,000**	**40,574.98**	
ZAE III			
Soil and Water Conservation Project	721,000	6,538.79	A = 2.7 ha
Promotion of Water Saving Irrigation Project	4,337,000	39,332.52	Equipment (3 ha), Pipe = 1 km, φ63), Control Pits
Rationalization of Market Distribution Project	166,000	1,505.46	
Total	**5,224,000**	**47,376.77**	
ZAEIV			
Soil and Water Conservation Project	721,000	6,538.79	A = 2.7 ha
Agro-forestry Project	854,000	7,744.98	A = 2.7 ha
Rationalization of Market Distribution Project	166,000	1,505.46	
Total	**1,741,000**	**15,789.24**	
Agricultural Support Service			
Group Leaders Training Project	2,186,000	19,824.97	9 days, 10 extension officers, 30 farmers
Extension among Farmers Project	1,096,000	9,939.69	8 days, 10 extension officers, 30 farmers
Capacity Building of Extension Officers Project	247,000	2,240.06	8 days, 10 extension officers
Promotion of Water Saving Irrigation Project (Training for Water Saving Irrigation)	607,000	5,504.92	10 extension officers (8 days), 30 farmers (5 days)
Total	**4,136,000**	**37,509.64**	
Total	**19,392,000**	**175,867.23**	
Promotion of Water Saving Irrigation Project (Training for Water Saving Irrigation)	1,796,000	16,288.03	Annual Cost

(3) Project Effects

Major estimated effects by implementing the Action Plan are as follows.

Implementation of the "Soil and Water Conservation Project" in 5.4 ha of land per watershed makes its implementation of 43.2 ha of land in total with eight watersheds in five years planned. It brings about the effect of 43.2 ha of protected national land from being devastated and possibility of fruit trees growing in the same land. Concerning its effect of recharging groundwater, 17,280 m^3 of the groundwater are estimated to be recharged in five years, since some 400 m^3 of the groundwater are recharged per ha annually. In addition, by its implementation, the farmers become aware of the importance of management of the natural resources.

Implementation of the "Agro-forestry Project" in 2.7 ha of land per watershed makes its implementation of 21.6 ha of land in total with eight watersheds in five years planned. It brings about the effect of 21.6 ha of forest conservation and possibility of forage crops cultivation in the same land. Moreover, the project can improve motivation of the rural residents for the management of forestry preserve.

Implementation of "Water-spreading Project" enables the cultivation of agricultural crops in 2 ha of land per watershed and makes 16 ha of arable land in total with eight watersheds in five years planned. Also, 6,000 m^3 of water resources in a watershed are efficiently used with three floods annually, which amounts to 48,000 m^3 in total.

Implementation of the "Promotion of Water Saving Irrigation Project" in 6 ha of irrigation land per watershed makes its implementation of 48 ha of the land in total with eight watersheds in 5 years planned. It brings about some 960 m^3/day (20 m^3/day/ha x 48 ha) of water saved (some 216,000 m^3/year of water, provided that irrigation period is 225 days/year), and increases some 24 ha of water saving irrigation land.

(4) Project Implementation Organization

Since activities in the Action Plan is supported and supervised by the extension officers of Agricultural Local Offices, the Local Coordination Committees, headed by the chiefs of the Offices, are established to monitor the implementation of the Programs at ACB level. The Local Coordination Committee composed of the leaders of ACBs and the extension officers of the Offices is responsible for securing transparency on the issues of natural resources in the watershed in a democratic way, as well as for maintaining and coordinating the progress of the Programs. In other words, this Committee is the forum where rural residents discuss and seek solutions on the items which were decided exclusively by the functionaries of the Government before. Group leaders meetings are used for the regular meetings of the Local Coordination Committee, where each of the ACBs reports their achievements in the Programs as well as ACBs discuss the points of concerns raised by them one another.

DGASP is an implementing organization of the Action Plan, so the National Coordination Committee is established in DGASP as a responsible management department. The National Coordination Committee consists of the responsible persons of each department (DSAP, DSER, DSS) in DGASP and interacts with the other related organizations on the management of natural resources in the watershed (DGA, INERF, INGRH, INIDA, INMG) to share information on the water resources in the watershed. The monitoring of the implementation of the Action Plan shall be appropriately carried out taking into consideration the information.

The Steering Committee headed by the Director General of DGASP and consisting of the responsible officers in the related organizations at central level is organized to monitor the implementation of the Action Plan in the political aspect.

The implementation Organization Chart of the Action Plan is described as follows.

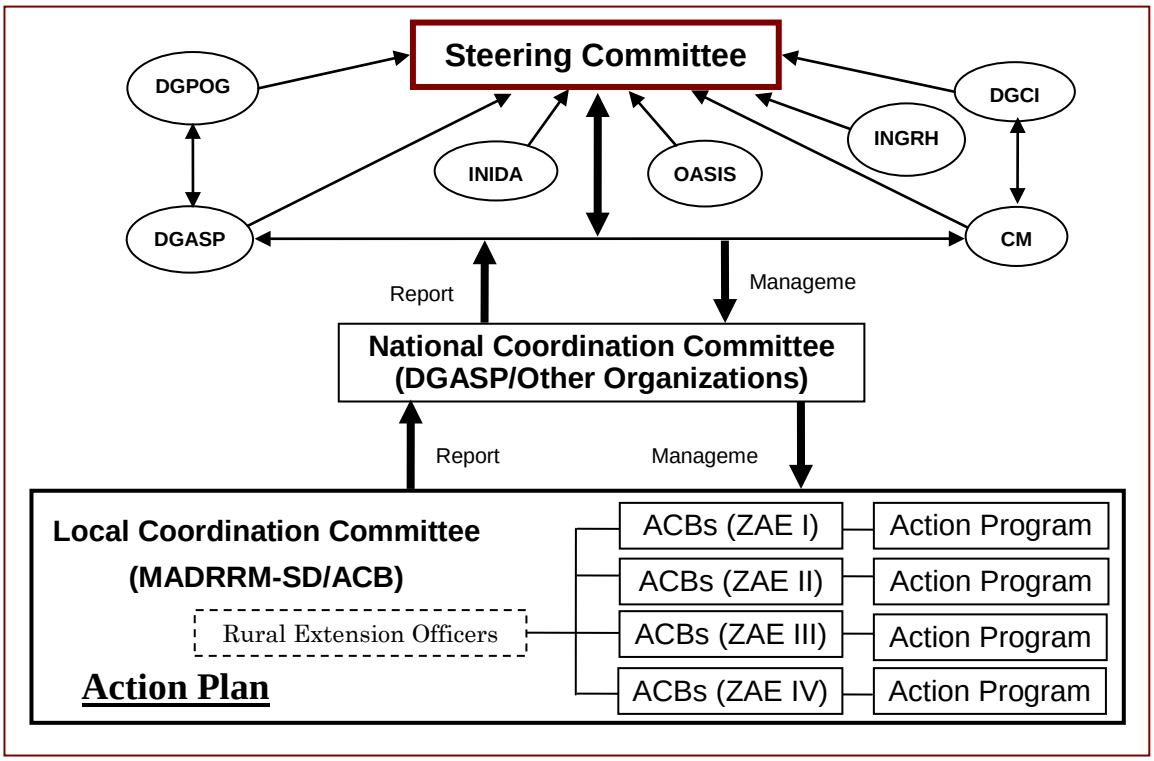


Figure 7.3.2 Implementation Organization Chart of Action Plan

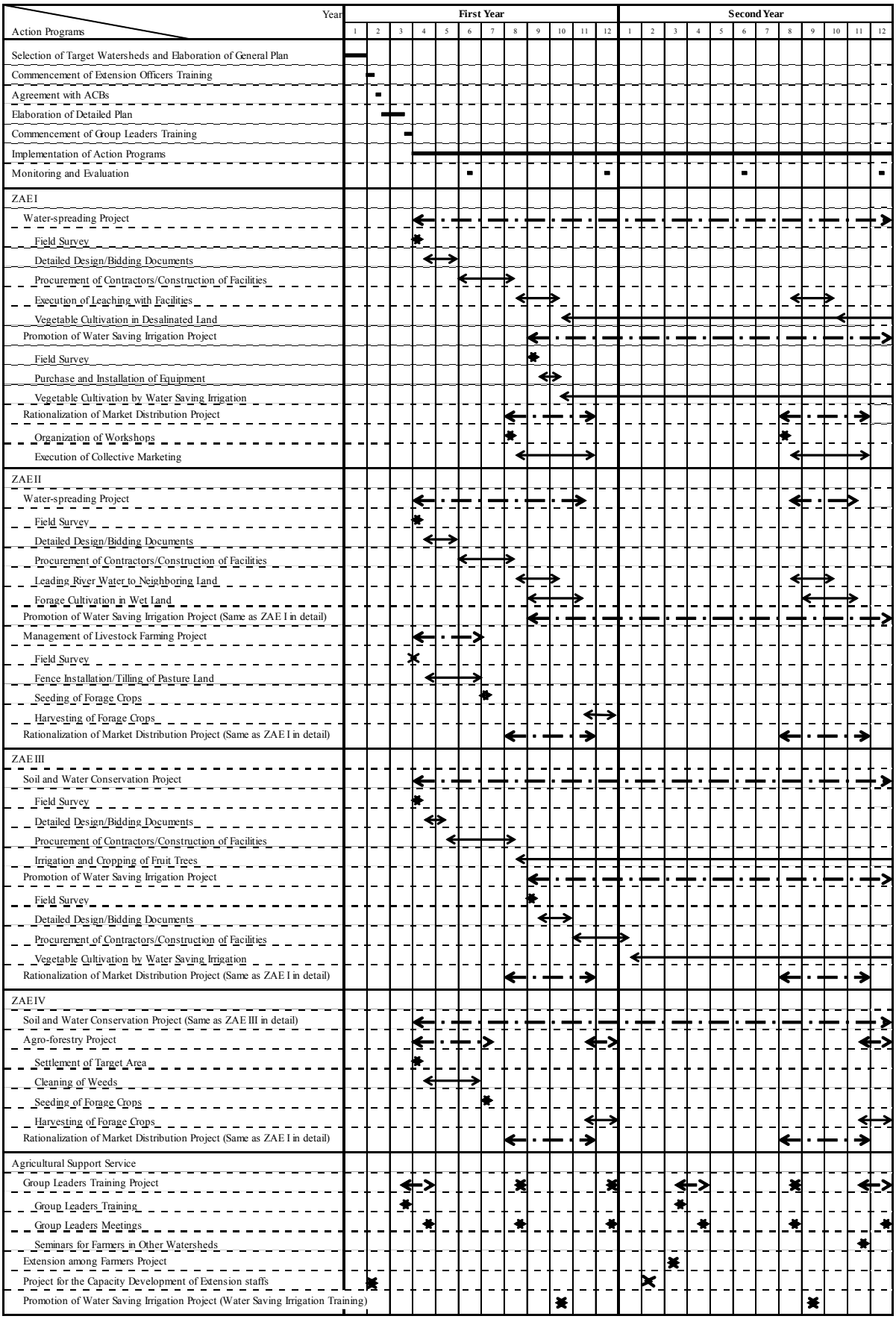


Figure 7.3.3 Implementation Schedule in Unit of Watershed

Chapter 8 Conclusion and Recommendation

8.1 Conclusion

(1) This Study aimed to draw up the Action Plan for integrated rural development which contributes to feasible and sustainable agriculture and soil and water conservation, through good use of natural resources in the watersheds in Santiago Island. The Draft Action Plan was drawn up in the Study, and some parts of the Plan were implemented as pilot projects, so that it could assess the Draft Action Plan. Based on the results of the projects, 9 feasible action programs which composed the Action Plan were proposed finally.

This study revealed that the largest standing block of the study area lied in the lack of agricultural water due to scarce rainfall and of agricultural lands due to small and steep landscape. Therefore, the Action Plan consists of the action programs which solve those standing blocks and the programs which complement and support them.

(2) This Action Plan aims at realization of the rural development through good use of limited natural resources contributing to increase in living standard of the farmers in Santiago Island. "Soil and Water Conservation", "Agro-forestry", Water-spreading", "Promotion of Water Saving Irrigation", "Management of Livestock Farming" and "Rationalization of Marketing Distribution" are to be implemented in the Action Plan with the implementation of the human resources capacity building programs as supporting projects. The effectiveness and feasibility of those programs have been ascertained through the implementation of the pilot projects carried out gether with the staff members of DGASP and the Agricultural Local Offices. Most of the programs do not require high degree techniques and the staff members of the Government of CV are able to handle them with their technical level. Since the benefit in natural environment and contribution to increase in farmers' living standard are anticipated and due to easy techniques, the implementation of the Action Plan is judged to be justified.

(3) The basic conditions for attaining the objectives of the Action Plan are provision of effective agricultural support programs, centering on human resources capacity building and proposed in the Action Plan by the Government of CV. To fulfill them, the Government shall not only mobilize competent local human resources but also obtain technical assistance from advanced countries, including assignment of specialists. Positive intention of the CV side in those issues was confirmed in the staring committee meeting and the seminar carried out at the final stage of the Study. These tasks will bring about not only the success of the Action Plan but also an important indirect effect on rural development in other islands of CV.

(4) The Action Plan follows exactly the policy of CV which sets forth the objectives of "promotion of soil and water conservation", "preservation and effective use of water resources", "measures against salt damage", "sustainable natural resources management", "reinforcement of marketing and

inauguration by farmers' group", "reinforcement of human resources" and so forth.

(5) This project apparently improved technical and institutional capacity of counterparts and brought change in awareness of them. They learned technical operations in various trainings, including ones in Japan during the Pilot Project, planned and implemented projects with the study team, which strengthened awareness as administrators. Especially, functionaries, who learned basics of water saving irrigation, became able to instruct farmers with thorough understanding of the purposes, though they had guided them without any understanding on the water saving irrigation.

The study team invested its energy to interaction with farmers. As for the project of extension among farmers, it stimulated 101 farmers. The project enhanced vitalization of farmers through discussion among farmers on new technologies, and through reports to other farmers. Also, in group leaders meeting, they exchanged opinions on activities on each of the ACB, problems which they faced in their everyday business. In addition to this, in group leaders training, the participants acquired basic principles in promoting group activities, knowledge needed for accounting and necessity of meetings. The trainings especially devoted plenty of time for information sharing. As for the trainings of farmers, the extension officers always took part in the trainings as coordinators, which cultivated their responsibility for the instruction towards farmers.

As such, one of the objectives of the Study " capacity building of the government staff and the residents through the execution of the Study" was achieved. However, the technical assistance by the government of CV shall be continuously carried out.

8.2 Recommendation

(1) Implementation of Action Plan

Considering the results of the Pilot Project implemented in this Study, the study team selected feasible Action Programs which composed the Action Plan. These nine programs proposed are commonly applicable to watersheds in Santiago Island and efficient for sustainable use of natural resources and integrated rural development for every ZAE. Hence, the Government of CV shall put his effort on promoting and extending the Action Plan.

(2) Acquisition of Budget

This study recommends the Government of CV to actively secure budget for the implementation of the Action Plan. Budgetary resources shall be primarily from the Government but are not so expectable from the current budgetary conditions. The next resources shall be from the assistances of donors, chiefly developed countries, International Organizations and NGOs. Since the various aid organizations are currently operating in CV, the Government shall keep in close contact with them. Besides, the counterpart fund of Japanese KR can be a suitable fund for the Action Plan, as it is appropriate to make good use of the fund for the projects or relevant projects planned by Japan.

(3) Promotion of Water Saving Irrigation

As has been discussed above, one of the major obstacles in this Study Area lies in the lack of agricultural water with limited rainfall. Farmers are practicing rain-fed agriculture depending on the rare and irregular rainfall; therefore, so the yields are changeable, hence unstable every year. On the other hand, with respect to the irrigated agriculture, the existing water resources are limited, and development of the new water resources, which consist of acquisition of surface water and exploitation of ground water, is a pressing need for the enlargement of irrigated land. However, since this development with the acquisition of surface water requires infrastructure development with a certain amount of initial investment and the Action Plan aims at sustainable development with low technical cost, it is not included except water-spreading system. Also, the development of ground water is not included, taking into consideration the salt density of the ground water.

In the midst of these restrictions, the Action Plan has proposed promotion of water saving irrigation as a measure for the expansion of irrigative agriculture without doveloping new water resources. Instead of 1 ha of the traditional irrigation, introduction of the drip irrigation, which is more efficient irrigation method for water saving, results in 20 m^3 of surplus water a day (if calculated as 225 days a year, 4,500 m^3 a year) and increase of some 0.5 ha of drip irrigation farm land. On the other hand, by implementing soil and water conservation project to conserve national lands for 1ha, 400 m^3 of ground water annually is possibly recharged as an appurtenant function. On the contrary, compared with this, the drip irrigation is more efficient securing ten times more water resources than this. The Action Plan has planned to introduce the drip irrigation for 48 ha of farm land in total, in 8 watersheds for five years. This enlarges some 24 ha of irrigation farm land. Therefore, it is strongly recommended to the Government of CV to focus on the promotion and expansion of water saving irrigation, as its introduction is efficient for enlargement of irrigation farm land of CV.

Besides, for promoting the introduction of water saving irrigation, the Government of CV shall assist it with the establishment of legal supporting system as well as technical support. For instance, the landless farmers meet a restriction to get a loan for purchasing the equipment as they do not have land for mortgage. Therefore, the establishment of subsidy system is required. This establishment will accelerate the introduction of water saving irrigation.

In addition to this, for the promotion of water saving irrigation, it is necessary to collect its basic data and establish practical and suitable techniques adaptable to the regional conditions. Therefore, this Study set up the experimental farm and started the water saving irrigation study. However, as the experiment was executed only once during the Study, it was difficult to get the trustable data. Additionally, concerning the pitcher irrigation carried out during the experiment, its effect of water saving was ascertained to be the same level of the drip irrigation, but its cost became higher than that of the traditional irrigation. As a result, only the drip irrigation is proposed as an Action Program, and the drip irrigation is considered to be introduced possibly in future. Since the pitcher irrigation has the advantages which the drip irrigation does not have, such as locally available equipment and its simple method, possibility of introduction of the pitcher irrigation in future shall be studied. Hence, the Government of CV shall necessarily continue the experiment to get more reliable data. It is strongly recommended to the Government of CV to continue the experiment with preparation of the budget for

operation of the experimental farm.

(4) Continuation of Rationalization of Market Distribution Project

The initial purposes of this project were achieved during the implementation of the Pilot Project. As the good example on the collective marketing did not exist before in CV, it is assured that the experiences of its implementation will be a valuable precedent for reference in implementing similar projects in future. Also, ACB of João Garido who implemented this project expresses its willingness to continue it. As for its continuation, though ACB shall carry out it independently, it is needed to assist them not to loose their will to continue which has finally started to grow. Therefore, the awareness creation for this project to the extension officers who will be a driving force of the project shall be made through "Capacity Building of Extension Officers Project" which will be carried out in the Action Plan.

(5) Strengthening of Agricultural Extension

ETER in DGASP and Agricultural Local Offices are engaged in agricultural extension. But, the implementation and extension of the projects cannot be realized, unless they possess adequate implementing capacity, however superior the Action Plan is. Extension sector plays a role as a pipe between farmers and administration. It could be said that the pipe became reinforced through this Pilot Project. The famers came to feel the administration familiar through the extension officers, and mutual trust between them has been strengthened. It is recommended that the relationship shall be enhanced and the sector shall be further strengthened.

(6) Utilization of Manuals

In the Study, three manuals, namely "Rural Extension Manual" for capacity building of the extension officers, "Water Saving Irrigation Manual" to introduce the water saving irrigation smoothly and "Agricultural Produce Processing Manual" showing methods for agricultural produce processing. These are the components taught in each of the project as on-the-job training. The study team compiled the manuals to extend the techniques acquired during the Pilot Project. It is strongly recommended that the persons in charge to make good use of these manuals.

To materialize the good use of the manuals, they shall be always with ones who need and use them day by day. Even if the manuals are delivered, they would be useless if they are piled on desk. Therefore, it is recommended that the priority shall be given to the extension officers for receiving the manuals, who have a role to guide the farmers and exceedingly need the manuals. Additionally, it will be unrealistic to extend the techniques effectively, if the extension ficers do not have enough knowledge of manuals' contents and how to use them. It is needed to train them for the acquisition of such knowledge through "Capacity Building of Extension Officers Project" which will be carried out by DGASP in the Action Plan, drawing up the curriculum concerning the knowledge in the Project.

Besides, since techniques are improved day by day, revision of the manuals is needed simultaneously with the improvement. The revision shall be carried out by ETER of DGASP seeking support from INIDA same as the time of their preparation.

Attachment

Attachment 1 Agricultural Produce (000US$)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	
Maize	988	349	511	314	293	154	1410	2461	1918	1129	1327	960	1193	1381	949	949	1184	569	567	4234	2828	2272	589	1412	470	470	Maize
Potato	363	363	189	116	363	319	363	435	493	283	363	387	259	344	201	313	334	355	377	363	471	493	493	508	508	508	Potato
Sweet potato	563	653	201	161	211	261	665	1377	1206	1256	1206	683	310	310	317	318	325	332	342	382	402	402	382	402	402	402	Sweet potato
Cassava	216	288	58	68	115	159	252	447	411	411	360	245	202	231	231	231	227	224	224	245	216	216	216	216	216		Cassava
Beans	2361	133	785	584	1431	555	1600	3709	3202	3137	1956	1729	1405	813	682	628	1499	1540	1673	1752	1859	2203	2203	2203	2203	2203	Beans
Peanut							145	145																			Peanut
Sugarcane	312	218	166	187	177	274	208	312	326	377	388	374	374	392	322	291	260	260	260	260	291	312	291	291	291		Sugarcane
Coffee	41	82																									Coffee
Fresh vegetables	9	244	94	131	281	413	206	56	75	90	56	15	23	47	51	60	92	94	94	94	103	103	103				Fresh vegetables
Pepper	2376	2376	2376	2376	2376	2376	2376	2376	2376	3386	3321	891	1247	2376	2554	2228	3475	2376	2673	2970	2673	2673	2970	2970	2970	2970	Pepper
Tomato	12	24	24	24	24	24	47	95	128	242	407	227	227	350	355	355	556	757	753	904	1007	1019	1066	1066	1066	1066	Tomato
Cabbage	0	0	0	0	0	0	0	338	382	426	183	213	239	301	323	323	343	363	393	641	616	661	588	588	588	588	Cabbage
Onion	55	55	55	55	74	74	74	111	129	249	232	177	127	199	144	155	179	204	191	253	280	295	295	295	295	298	Onion
Pumpkin									185																		Pumpkin
Fresh fruit	574	574	558	558	558	558	558	574	590	606	615	622	638	654	670	686	702	718	718	718	718	718	718	718	718	718	Fresh fruit
Banana	998	855	428	428	428	713	527	641	770	812	855	855	855	941	741	855	855	855	855	855	855	855	855	855	855	855	Banana
Mango	487	487	609	730	852	974	1047	1096	1120	1144	1159	1193	1144	1120	1096	1096	1096	1096	1096	1096	1096	1096	1096	1096	1096	1096	Mango
Coconut	904	904	904	904	904	724	724	543	543	543	543	543	452	452	452	452	452	452	452	452	543	543	543	543	543	543	Coconut
Pork	1063	1165	1860	1489	1396	2404	2545	3038	3225	3456	3758	3960	7420	7089	4755	8456	3099	5063	6562	7089	6582	7086	7086	7086	7289	7289	Pork
Beef	372	496	501	372	252	403	463	525	724	755	765	641	705	734	755	662	1435	1096	1241	914	993	1034	931	931	931	951	Beef
Goat meat	350	426	505	442	446	367	428	438	725	592	600	693	700	731	730	639	624	632	754	716	685	685	716	718	719	720	Goat meat
Chicken	268	327	359	330	441	392	535	525	531	563	531	533	546	534	479	452	450	584	612	570	452	471	429	372	377	388	Chicken
Egg	174	208	227	208	268	208	366	414	476	424	432	686	984	1549	1563	1737	1737	1823	1737	1737	1606	1606	1563	1433	1519	1537	Egg
Milk	149	169	141	113	173	253	306	332	479	505	519	439	473	484	492	505	1510	1463	1542	1542	1356	1277	1277	1277	1436	1436	Milk
Goat milk	633	693	1137	633	578	654	762	842	1361	1167	1195	1387	1507	1718	1748	1537	1534	1417	1356	1447	1387	1507	1658	1658	1658	1688	Goat milk

Source: FAOSTAT

Attachment 2 Import of Agricultural Produce, etc (000US$)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
Spirits	241	312	303	349	233	478	356	443	615	709	554	458	639	815	590	1103	1141	601	1061	978	859	912	688	1670	2919	Spirits
Water/ Ice	0	0	100	55	69	69	172	110	214	205	285	287	289	479	400	1256	823	771	820	881	914	930	727	1119	853	Water/ Ice
Beer	1041	1083	1056	1238	1209	1397	1942	2051	1084	216	378	416	549	632	608	790	1043	888	3061	4573	6075	6083	5970	8735	8010	Beer
Wine	978	991	944	983	1122	1043	1287	1744	2307	2027	1966	2085	2198	2576	2558	3319	3434	2253	2268	2084	1306	1672	2277	2895	3675	Wine
Carbonated drink	698	633	595	866	665	717	1270	1538	812	703	993	1096	1376	1515	1565	2251	1524	1064	765	2035	3271	3827	3434	4153	3879	Carbonated drink
Juice				87	69	108	159	143	238	318	523	595	866	996	1374	2256	1413	1202	1300	849	194	202	1290	1690	3144	Juice
Soybean oil	4	13	28	197	1	217		175	1093	447	20	117	430	92	1747	1627	3493	2027	4793	4015	3368	3285	4757	5375	7388	Soybean oil
Olive oil	558	410	733	712	445	634	622	768	854	554	1792	699	2174	952	1720	1989	1732	1821	1609	1344	1478	1055	1531	1961	3148	Olive oil
Margarine	172	511	291	546	469	555	624	677	898	376	1169	654	2116	775	1598	1968	2101	1796	2184	1794	1308	1612	1915	2545	4296	Margarine
Other oils	735	952	941	1728	650	838	2622	1671	478	1339	1319	2593	2352	1707	4834	4963	1954	1219	102	141	114	93	314	58	67	Other oils
Coffee	13	536	115	388	817	897	984	1011	1261	1398	294	850	1182	1013	1141	2586	1994	1350	1320	1379	1186	850	294	430	1151	Coffee
Wheat	1352	1310	1213	1306	1469	1501	1897	1827	1515	1351	2000	2984	2952	2250	2241	2551	2674	2772	2269	1811	3337	3089	3421	5027	5212	Wheat
Maize	6531	5282	3156	5936	3720	3898	7512	4486	2915	4469	5200	5000	14459	4099	5192	7287	1955	11089	6124	7146	2148	3754	2760	9250	1337	Maize
Rice	3426	2351	4131	1541	1674	3596	2969	2208	3023	4246	2582	4607	5409	4659	4844	5798	8032	9014	6071	8428	6792	6935	4856	5550	777	Rice
Potato	504	217	402	754	398	778	504	607	526	640	978	1136	1373	1375	1701	2564	1461	1563	1829	2355	1570	1714	1772	2152	2354	Potato
Beans	3192	74	44	591	1067	134	1081	1022	158	154	1143	629	2836	1569	1464	3244	1489	2254	3208	2482	1791	1118	888	921	1064	Beans
Tobacco	627	646	472	696	399	386	567	658	538	611	678	794	932	758	795	469	366	300	747	1382	1546	1749	894	40	119	Tobacco
Sweets	638	611	1379	534	519	612	951	753	878	1161	832	1553	1383	1785	1931	1494	1332	1746	1680	2113	2089	1832	2217	2503	4420	Sweets
Fresh vegetables	14	14	19	24	29	35	15	981	125	113	959	534	2603	1290	27	87	115	397	16	12	18	22	134	100	300	Fresh vegetables
Fresh fruit	9	4		6	9	7	5		29		39	3	79	215	80	107	100	101	17	20	23	21	187	149	296	Fresh fruit
Processed foods	497	520	705	663	676	769	1055	1447	1398	1360	1895	2532	3460	2614	3767	4260	3295	4634	5272	5015	5553	5565	5695	7339	10840	Processed foods
Processed vegetables	228	197	226	256	247	283	372	197	255	125	528	375	438	493	528	857	1524	1081	1029	1062	1059	1229	1232	1331	1438	Processed vegetables
Processed fruit	386	303	231	82	145	12	56	220	273	179	110	181	258	207	279	189	172	503	268	234	160	217	224	272	274	Processed fruit
Sugar	3054	3460	4242	3416	2030	2357	2073	2976	1427	4621	4384	3914	4354	5182	4501	6511	7998	6043	6781	4752	3939	5675	1706	3000	4100	Sugar
Lard	1226	857	1425	1050	1253	366	2126	716	758	1799	546	1221	1285	751	1102	650	1243	548	748	551	438	428	357	422	430	Lard
Chicken	128	90	13	23	17	9	6	2	25	28	46	223	338	426	328	193	78	106	243	450	1278	2037	2000	2886	4906	Chicken
Pork	100	35	84	71	58	60	65	70	109	122	195	230	374	517	702	1175	516	723	843	1091	977	1117	1217	1556	1817	Pork
Beef products	151	80	133	182	162	94	242	166	440	681	616	294	2190	1329	979	1346	1028	711	174	65	36	73	9	660	57	Beef products
Milk	3	18	7	14	17	12	137	179	19	29	55	80	78	155	146	280	458	541	638	789	847	1169	1035	1679	2050	Milk
Milk powder	151	65	82	52	59	84	566	1558	2403	1111	3219	3785	5457	4078	4924	7662	5882	5196	6052	6698	4653	8956	6492	7356	9180	Milk powder
Nonfat milk powder	945	1774	1547	1663	2099	766	1600	773	266	62	1141	591	344	1514	1394	736	1522	495	247	367	522	40	86	15	750	Nonfat milk powder
Butter	254	268	214	87	145	100	288	651	80	214	736	259	188	272	172	125	201	177	169	185	232	242	364	442	599	Butter
Baby food	180	393	221	302	88	116	340	143	310	196	358	396	514	405	503	861	563	589	560	634	580	689	411	1263	1579	Baby food
Total	28,036	24,010	25,052	26,398	22,029	22,928	34,465	31,971	27,324	31,564	37,533	41,171	65,475	47,495	55,735	72,554	62,656	65,575	64,268	67,715	59,661	68,192	61,154	84,544	92,429	Total

Source: FAOSTAT

Attachment 3 Export of Agricultural Produce, etc. (000US$)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
Spirits							13	12	12	6	21	24	7	186	120	148	4	95	153	243	Spirits
Water/ Ice	12	16	23	10	3	14	10	14	3	7	7	24	20	19	13	28	11	11	11	11	Water/ Ice
Beer									24	4	1	11			3	7				5	Beer
Wine										1		5		9	8	63		1			Wine
Liquor														1							Spirits
Carbonated drink									53	12	4	35	6	2	8	13					Carbonated drink
Concentrated juice														4	5	4					Concentrated juice
Apple juice										3	1	14	11		1	1					Apple juice
Tomato juice														1							Tomato juice
Coffee (green bean)									23				18			2		29	8	24	Coffee (green bean)
Roasted coffee																74	87	87	24		Roasted coffee
Tobacco														145	24	19					Tobacco
Banana	560	1,019	874	1,205	1,702	1,924	1,669	1,363	457	43	41			13	32						Banana
Coconut															2	2					Coconut
Rice															1						Rice
Potato															1						Potato
Dry beans											12		4								Dry beans
Maize											1										Maize
Castor beans	4	6																			Castor beans
Sweets							2		1		3	17	56	4	7	6	1	20	27	46	Sweets
Processed foods															19		7	7	7		Processed foods
Processed										7			4								Processed
Sugar				98																	Sugar
Wheat bran	20																				Wheat bran
Beef																2					Beef
Pork															6						Pork
Pork lard															2						Pork lard
Chicken																1					Chicken
Egg													3								Egg
Pork sausage																1					Pork sausage
Cream																1					Cream
Milk															1						Milk
Skim milk																					Skim milk
Leather	1	11	13	23		85	67	57	41	1	57	32	26			3					Leather
Meat of wild animal															8						Meat of wild animal
Bacon															1						Bacon
Ice cream													25								Ice cream

Source: FAOSTAT

Attachment 4 Food Balance and Self-sufficiency Rate (2003)

	Domestic production (000MT)	Import (000MT)	Total (000MT)	Export (000MT)	Ração (000MT)	Mudas (000MT)	Raw materials for industry (000MT)	Loss, etc. (000MT)	Total (000MT)	Food balance (000MT)	Food/ person /year (kg)	Calorie/ person /year	Protein/ person /year	Fat/person /year	Self-sufficiency rate of calories	Self-sufficiency rate of cereals
Cereals																
Wheat	0.00	22.21	22.21	0.03				0.59	0.62	21.59	46.64	395.86	10.93	1.82		
Rice	0.00	23.05	23.05					0.46	0.46	22.59	48.78	487.32	9.40	0.67		11.2%
Barley	0.00	0.36	0.36				0.35		0.35	0.01	0.01	0.04	0.00	0.00		
Maize	12.15	51.04	63.19		18.00			2.08	20.08	43.11	88.79	772.80	20.36	8.32		
Tubers																
Cassava	3.00	0.65	3.65					0.30	0.30	3.35	7.24	20.71	0.18	0.02		
Potato	3.50	10.01	13.51		0.21			0.66	0.87	12.64	27.30	51.56	1.08	0.07		
Sweet potato	4.00	0.00	4.00					0.40	0.40	3.60	7.78	20.46	0.28	0.04		
Other tubers	0.00	0.67	0.67						0.00	0.67	1.43	1.67	0.02	0.01		
Sugar cane	14.00		14.00		13.20		0.80		14.00	0.00	0.00	0.00	0.00	0.00		
Sugar	0.00	12.93	12.93						0.00	12.93	27.92	277.43	0.00	0.00		
Other Sweeteners	0.00	2.04	2.04						0.00	2.04	4.40	18.95	0.00	0.00		
Honey	0.00	0.01	0.01						0.00	0.01	0.02	0.20	0.00	0.00		
Beans	5.00	2.31	7.31			3.20		0.25	3.45	3.86	8.35	78.30	5.06	0.44		
Oil crops	6.03	0.94	6.97	0.44				3.04	3.48	3.49	7.55	22.34	0.32	2.13		
Nuts	0.00	0.03	0.03						0.00	0.03	0.07	0.40	0.01	0.04		
Vegetable oil	0.00	8.18	8.18						0.00	8.18	17.67	426.51	0.05	48.21		
Vegetables																
Tomato	4.50	1.74	6.24					0.45	0.45	5.79	12.49	7.22	0.35	0.07		
Onion	1.60	1.72	3.32					0.33	0.33	2.99	6.45	6.89	0.20	0.04		
Other vegetables	9.56	2.59	12.15					0.07	0.07	12.08	26.11	20.40	1.04	0.14		
Fruit																
Tangerine	0.00	1.53	1.53						0.00	1.53	3.30	1.73	0.02	0.01		
Lemon	0.00	0.08	0.08						0.00	0.08	0.17	0.09	0.00	0.00		
Other citrus	0.00	0.02	0.02						0.00	0.02	0.05	0.02	0.00	0.00		
Banana	6.00	0.00	6.00					0.60	0.60	5.40	11.66	19.17	0.32	0.03		
Apple	0.00	1.32	1.32						0.00	1.32	2.85	2.93	0.01	0.02	17.9%	
Pineapple	0.00	0.07	0.07						0.00	0.07	0.15	0.26	0.00	0.00		
Grape	0.00	0.12	0.12						0.00	0.12	0.26	0.42	0.00	0.00		
Other fruits	9.00	4.49	13.49					0.93	0.93	12.56	27.13	28.77	0.28	0.19		
Luxury foods																
Coffee	0.00	0.60	0.60	0.02					0.02	0.58	1.26	1.67	0.16	0.00		
Cacao	0.00	0.10	0.10						0.00	0.10	0.22	4.01	0.05	0.37		
Tea	0.00	0.25	0.25						0.00	0.25	0.55	0.27	0.07	0.00		
Spices																
Pepper	1.00	0.02	1.02						0.00	1.02	2.21	19.27	0.73	1.05		
Other spices	0.00	0.04	0.04						0.00	0.05	0.10	0.89	0.02	0.04		
Alcohol drink																
Wine	0.00	3.02	3.02						0.00	3.02	6.51	12.42	0.00	0.00		
Beer	1.61	11.68	13.29						0.00	13.29	28.72	33.83	0.39	0.00		
Other alcohol drink	0.08	0.30	0.38	0.04					0.04	0.34	0.74	5.61	0.00	0.00		
Meat																
Beef	0.45	0.60	1.05						0.00	1.05	2.27	10.85	1.05	0.72		
Meats of sheep and goat	0.51		0.51						0.00	0.51	1.10	3.78	0.41	0.22		
Pork	7.00	1.61	6.61						0.00	8.61	18.59	150.32	5.57	14.02		
Chicken	0.37	3.68	4.05						0.00	4.05	8.73	29.03	3.07	1.76		
Other meat	0.51	0.17	0.68						0.00	0.68	1.47	5.07	0.71	0.20		
Dairy products.																
Butter	0.00	0.10	0.10						0.00	0.10	0.21	4.11	0.01	0.47		
Cream	0.00	0.09	0.09						0.00	0.09	0.19	1.04	0.00	0.10		
Butterfat	0.53	0.74	1.27					0.11	0.11	1.16	2.51	49.27	0.14	5.40		
Milk	10.30	27.56	37.86					0.15	0.15	37.71	81.46	146.05	7.58	8.04		
Egg	1.65	0.05	1.70			0.04		0.07	0.11	1.59	3.46	11.65	0.98	0.79		
Fish and shellfish																
Abyssal	1.31	0.18	1.49	0.03					0.03	1.46	3.14	3.50	0.69	0.07		
Pelagic fish	7.69	0.58	8.27	0.39					0.39	7.68	17.03	40.36	5.79	1.73		
Other marine fish	0.63	0.01	0.64	0.01					0.01	0.63	1.40	2.45	0.40	0.08		
Crustaceans	0.02	0.02	0.04						0.00	0.04	0.08	0.11	0.02	0.00		
Cephalopods	0.00	0.03	0.03						0.00	0.03	0.06	0.11	0.05	0.00		
Other mollusks	0.00	0.17	0.17						0.00	0.17	0.37	0.08	0.00	0.00		

Source: FAOSTAT

Attachment 5 Cost of the Project (1/2)

Soil and Water Conservation	2.7 ha		721,000 ECV	
Crescent filling works	489	#	67	32,763
Stone masonry works (H = 100 - 120 cm)	246	m	1,600	393,600
Hole setting (60 x 60 cm)	489	#	57	27,873
Fruit tree	489	#	300	146,700
Transportation and plantation of fruit tree (farmers' cost)	489	#	17	0
Irrigation to fruit tree (farmers' cost)	489	#	5	0
Total construction cost				600,936
Technical cost (20% of construction cost)				120,187
Total cost				721,123

Agroforestry	2.7 ha		854,000 ECV	
Cleaning of forest	2.70	ha	263,700	711,990
Seeds (farmers' cost)	240	l	150	0
Activity cost				711,990
Technical cost (20% of activity cost)				142,398
Total cost				854,388

Water-spreading	1 ha		339,000 ECV	
Open canal (earth canal: 0.27 m^2)	1,000	m	203	202,500
Appurtenant facilities (15% of canal cost)				30,375
Water catchment facilities	1	#	50,000	50,000
Seeds (farmers' cost)	90	l	150	0
Total construction cost				282,875
Technical cost (20% of construction cost)				56,575
Total cost				339,450

Promotion of Water Serving Irrigation				
Introduction of drip irrigation (1)			4,337,000 ECV	
Drip irrigation equipment	3.00	ha	800,000	2,400,000
Installment cost (15% of equipment cost)				360,000
Pipeline (φ63)	1,000	m	450	450,000
Appurtenant facilities (20% of canal cost)				90,000
Sand box	1	#	54,500	54,500
Reservoir (25 m^3)	1	#	260,000	260,000
Total construction cost				3,614,500
Technical cost (20% of construction cost)				722,900
Total cost				4,337,400

Introduction of drip irrigation (2)			3,312,000 ECV	
Drip irrigation equipment	3.00	ha	800,000	2,400,000
Installment cost ((15% of equipment cost)				360,000
Total construction cost				2,760,000
Technical cost (20% of construction cost)				552,000
Total cost				3,312,000

Training First time (extension officers: 2 days、farmers＋extension officers: 3 days) Second time (extension officers: 1 day、farmers＋extension officers: 2 days)			607,000 ECV	
Lecturer (external expert)	8	day	15,000	120,000
Transportation cost (5 days: 30 farmers)	150	day	1,500	225,000
Miscellaneous cost (5 days: 30 farmers)	150	day	700	105,000
Miscellaneous cost (8 days: 10 extension officers)	80	day	700	56,000
Total construction cost				506,000
Overhead cost (20%of training cost)				101,200
Total cost				607,200

Continuous implementation of experiment			1,796,000 ECV	
Lecturer (external expert)	5	day	15,000	75,000
Incidental cost (5days: 5 extension officers)	25	day	700	17,500
Implementation cost	12	mon	117,000	1,404,000
Total cost of experiment				1,496,500
Overhead cost (20%of training cost)				299,300
Total cost				1,795,800

Attachment 5 Cost of the Project (2/2)

Pastoral Management	3 ha		657,000 ECV	
Barriers (wire entanglement) 414,000 ECV/900 m	800	m	460	368,000
Tillage of grassland	3	ha	60,000	180,000
Seeds (farmers' cost)	90	l	150	0
Total construction cost				548,000
Technical cost (20% of construction cost)				109,600
Total cost				657,600

Rationalization of Market Distribution			166,000 ECV	
Facilitator (external expert)	5	day	15,000	75,000
Miscellaneous cost (3days: 30 farmers)	90	day	700	63,000
Total training cost				138,000
Overhead cost (20%of activity cost)				27,600
Total cost				165,600

Group Leaders Training First training (4 days), Second training (2 days), Group leaders meeting (3			2,186,000 ECV	
Lecturer (external exoert)	11	day	15,000	165,000
Transportation (8 days: 30 farmers)	270	day	1,500	405,000
Miscellaneous cost (9 days: 30 farmers)	270	day	700	189,000
Miscellaneous cost (9 days: 10 extensionists)	90	day	700	63,000
Seminar for farmers of other watersheds (1 day)	1	#	1,000,000	1,000,000
Total training cost				1,822,000
Overhead cost (20%of training cost)				364,400
Total cost				2,186,400

Extension among Farmers Visit (4 days), Meeting (4 days)			1,096,000 ECV	
Lecturer (external expert)	10	day	15,000	150,000
Transportation 8 days: 30 farmers)	240	day	1,500	360,000
Miscellaneous cost (8 days: 30 farmers)	240	day	700	168,000
Miscellaneous cost (8 days: 10 extensionists)	80	day	700	56,000
Bus (transportation)	4	bus/day	45,000	180,000
Total training cost				914,000
Overhead cost (20%of training cost)				182,800
Total cost				1,096,800

Training of Extensionists First training (5 days), Second training (3 days)			247,000 ECV	
Lecturer (external expert)	10	day	15,000	150,000
Miscellaneous cost (8 days: 10 extension officers)	80	day	700	56,000
Total training cost				206,000
Overhead cost (20%of training cost)				41,200
Total cost				247,200

QUADRO DE TRABALHO
DO ESTUDO DE DESENVOLVIMENTO RURAL INTEGRADO
DAS BACIAS HIDROGRÁFICAS DA ILHA DE SANTIAGO
DA REPÚBLICA DE CABO VERDE
ASSINADO PELO
MINISTÉRIO DOS NEGÓCIOS ESTRANGEIROS, COOPERAÇÃO E COMUNIDADES
E
MINISTÉRIO DO AMBIENTE E AGRICULTURA
E PELA
AGÊNCIA DE COOPERAÇÃO INTERNACIONAL DO JAPÃO

Praia, 9 de Fevereiro de 2007

A - 7

Sr. Carlos Monteiro
Director Geral do Planeamento, Orçamento e Gestão
Ministério do Ambiente e Agricultura
República de Cabo Verde

Sr. Takemichi SHIRAI
Chefe da Missão de Estudo Preliminar
Japão

Sr. Antonio Pedro Alves Lopes
Director Geral de Cooperação Internacional
Ministério dos Negócios Estrangeiros, Cooperação e Comunidades
República de Cabo Verde

I INTRODUÇÃO

Em resposta à solicitação do Governo da República de Cabo Verde (doravante designado "GOCV"), o Governo do Japão (doravante designado "GOJ") decidiu realizar, de acordo com as leis e regulamentos relevantes em vigor no Japão, o estudo de Desenvolvimento Rural Integrado das bacias hidrográficas da Ilha de Santiago da República de Cabo Verde (doravante designado "o Estudo").

Baseado na decisão do GOJ, a Agência de Cooperação Internacional do Japão (doravante designada "JICA"), agência oficial responsável pela execução de programas de cooperação técnica, se encarregará do Estudo em estreita cooperação com as autoridades competentes do GOCV.

O presente documento estabelece o Quadro de Trabalho relacionado com o Estudo supra referido.

II OBJETIVOS DO ESTUDO

Os objetivos do Estudo são:

1. formular plano(s) de acção para o desenvolvimento rural integrado através de estudo das bacias hidrográficas (doravante designada "BH") da Ilha de Santiago, promovendo a utilização eficaz de recursos naturais, bem como a identificação e execução de projetos pilotos; e

2. reforçar a capacidade institucional do Pessoal da contraparte nacional através de formação em exercício, no decorrer do Estudo.

III ZONAS DE INTERVENÇÃO

O Estudo terá como zonas de intervenção as BH da Ilha de Santiago. O local dos projetos pilotos será selecionado de acordo com os seguintes critérios:

- Zona Agroecológica (doravante designada "ZAE");
- População;
- Micro clima;
- Inexistência da intervenção de outros doadores;

- Impacto Social;
- Necessidade.

A lista das BH e o mapa da localização estão nos Anexos I e II.

IV PRINCIPAIS ELEMENTOS DE ESTUDOS

O Estudo consistirá nos seguintes pontos:

Fase 1

1-1. Definir as características das BH através do estudo de terreno;

1-2. Selecionar a BH modelo de acordo com as características acima definidas;

1-3. Estudar as condições naturais e socioeconômicas da BH modelo;

1-4. Formular Esboço do Plano de Acção; e

1-5. Selecionar o local do projeto piloto em cada ZAE.

Fase 2

2-1. Estudar a viabilidade (técnica, econômica e social) das seguintes atividades no quadro de implementação dos projetos pilotos:

a. Promover técnicas adequadas para o ordenamento de novas parcelas dos camponeses;

b. Implementar medidas para controlo da erosão, através de reflorestação e instalação de estruturas mecânicas e biológicas de conservação de solos e água;

c. Estudar métodos eficazes de captação, armazenamento e gestão de água de escoamento superficial;

d. Implementar métodos eficazes para a utilização/gestão da água de rega a nível das parcelas;

e. Promover a diversificação agrícola e pecuária, através de plantas ornamentais, horticultura, fruticultura e sistema agro-silvo-pastoril;

f. Desenvolver tecnologias e técnicas culturais permitindo a diversificação agrícola e pecuária acima referida;

g. Estudar medidas que permitem a valorização dos produtos agropecuários a baixo custo, melhorando os meios de transformação, conservação e transporte dos mesmos; e

h. Recolha de dados de recursos naturais (solo, ocupação de terra, água, etc.), recorrendo ao Sistema de Informação Geográfica como sistema de gestão da BH.

2-2. Avaliar e propor métodos apropriados para vulgarização dos resultados obtidos durante a fase de implementação do projeto piloto, através das seguintes medidas:

a. Implementar a transferência tecnológica conduzida pelos agricultores treinados no projeto piloto (doravante designados "agricultores líderes");

b. Organizar visitas para os agricultores de outras localidades nas zonas de intervenção de projetos pilotos;

c. Organizar seminários técnicos destinados aos quadros nacionais, como os extensionistas, agricultores nucleares e outros técnicos do Ministério; e

d. Difundir amplamente os resultados deste estudo através de meios de comunicação.

2-3. Formular um Plano de Acção específico baseado nos resultados dos projetos pilotos.

V CRONOGRAMA DO ESTUDO

O Estudo será realizado conforme a sugestão do cronograma do Anexo III.

VI RELATÓRIOS

A JICA deverá preparar e submeter os seguintes relatórios para o GOCV:

No caso de surgir alguma dúvida de interpretação, deverá prevalecer a versão inglesa.

Relatório Inicial:	Vinte (20) cópias em português
Relatório Provisório:	Vinte (20) cópias em português
Relatório(s) Preliminar(es):	Vinte (20) cópias em português
Draft do Relatório Final:	Cinco (5) cópias em inglês e trinta (30) cópias em português, no final do trabalho de terreno. O GOCV fornecerá à JICA comentários sobre o Draft do Relatório Final no prazo de um (1) mês após a recepção.
Relatório Final:	Dez (10) cópias em inglês e quarenta (40) cópias em português, no prazo de dois (2) meses após a recepção dos comentários do Draft do Relatório Final, fornecidos pelo GOCV.

VII COMPROMISSO DO GOVERNO DE CABO VERDE

1. Para facilitar a realização eficaz do Estudo, o GOCV deverá tomar as seguintes medidas:

(1) Permitir que os membros da Missão de Estudo entrem, saiam e permaneçam em Cabo Verde, enquanto durar os seus trabalhos no país, e isentá-los de requerimento de registro de estrangeiro e taxas consulares;

(2) Isentar os membros da Missão de Estudo de taxas, impostos e outros encargos sobre equipamentos, maquinarias e outros materiais trazidos para Cabo Verde para a execução do Estudo;

(3) Isentar os membros da Missão de Estudo de imposto sobre renda ou encargos sobre ou relacionados a qualquer lucro ou subsídio que eles receberem pelos seus serviços prestados, relacionados à execução do Estudo; e

(4) Oferecer facilidades que se mostrarem necessárias, à Missão de Estudo, referentes à transferência bem como à utilização de fundos introduzidos em Cabo Verde pelo Japão, relacionadas com a execução do Estudo.

2. O GOCV deverá responsabilizar-se pelas reclamações, caso elas surjam, contra os membros da Missão de Estudo, relacionadas ao cumprimento de seus deveres em função da execução do Estudo, excepto quando elas forem devido à grave negligência ou conduta inadequada propositada por parte da Missão de Estudo.

3. O Ministério do Ambiente e Agricultura deverá providenciar o seguinte à Missão de Estudo, assumindo as despesas, quando necessário, em cooperação com outras organizações competentes:

(1) Segurança e proteção à Missão de Estudo, e informações relevantes;

(2) Informação, bem como assistência, para receber assistência médica;

(3) Dados disponíveis (incluindo mapas e fotografias) e informações relacionadas ao Estudo;

(4) Pessoal da Contraparte;

(5) Espaço apropriado para escritório, com mobiliários e aparelhos de comunicação (telefone e fax); e

(6) Credenciais ou cartões de identificação.

VIII COMPROMISSO DA JICA

Para a execução do Estudo, a JICA deverá tomar as seguintes medidas:

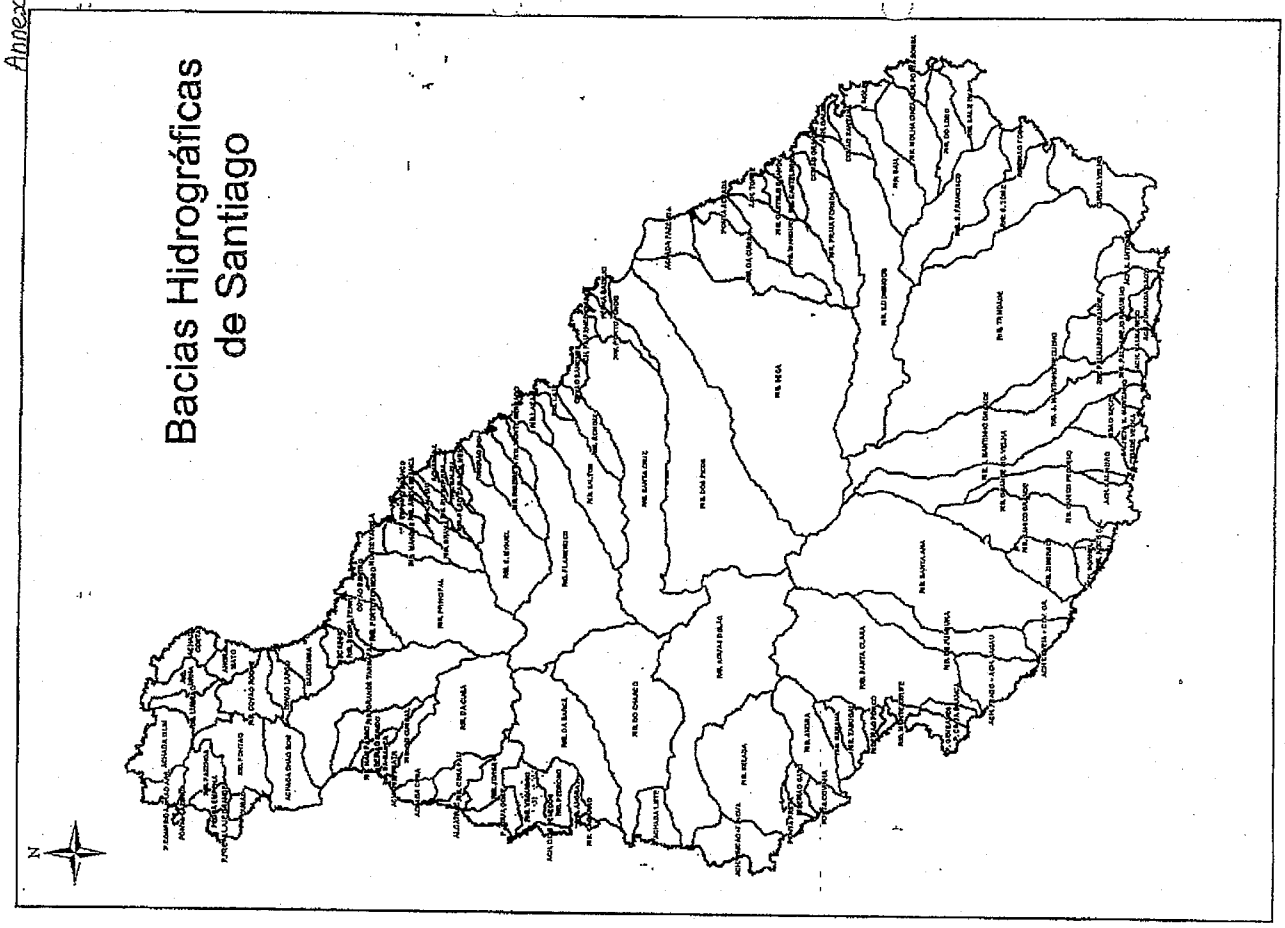
1. Enviar a Missão de Estudo para a República de Cabo Verde, assumindo as despesas; e

2. Assegurar a tranferência tecnológica e de habilidades ao Pessoal da contraparte Cabo Verdiana, bem como às comunidades, no decorrer o Estudo.

IX CONSULTAS

A JICA e o Ministério do Ambiente e Agricultura deverão se consultar mutuamente no caso de surgimento de qualquer problema relacionado ou devido ao Estudo.

Annex II

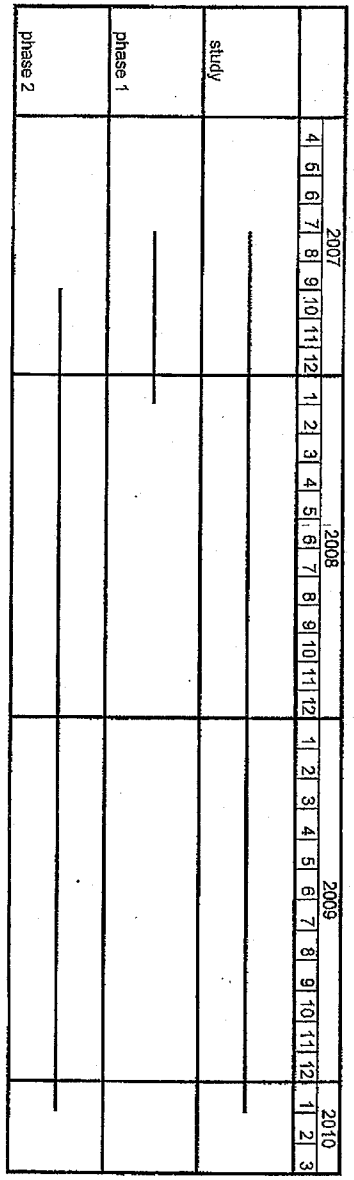


Anexo I: Lista das bacias hidrográficas da ilha de Santiago por ordem de prioridade

Ordem de Prioridade	Bacias Hidrográficas
1	São Domingos
2	Boa Entrada/Sta Cruz
3	São Martinho Grande
4	S. João Baptista
5	Charco
6	Cumba
7	Sta Clara
8	Ganchemba
9	Cuba
10	São Francisco

Annex I

ANNEX-3 Tentative schedule of the Study



SCOPE OF WORK

FOR

THE STUDY ON

THE INTEGRATED RURAL DEVELOPMENT IN WATERSHED ON SANTIAGO ISLAND

IN

THE REPUBLIC OF CAPE VERDE

AGREED UPON

BETWEEN

THE MINISTRY OF FOREIGN AFFAIRES, COOPERATION AND COMMUNITIES,

THE MINISTRY OF AGRICULTURE AND ENVIRONEMENT

AND

THE JAPAN INTERNATIONAL COOPERATION AGENCY

Praia, 9th February, 2007

Mr.Carlos Monteiro
Director General of Planning, Budget and Management
Ministry of Agriculture and Environment
The Republic of Cape Verde

Mr. Takemichi SHIRAI

Leader of Preparatory Study Team
Japan

Mr. Antonio Pedro Alves Lopes
Director General of Cooperation International
Direction General of International Cooperation
Ministry of Foreign Affairs, Cooperation and Communities
The Republic of Cape Verde

I INTRODUCTION

In response to the request of the Government of the Republic of Cape Verde (hereinafter referred to as "GOCV"), the Government of Japan (hereinafter referred to as "GOJ") has decided, in accordance with the relevant laws and regulations in force in Japan, to conduct a study on the Integrated Rural Development in drainage basins on Santiago Island in the Republic of Cape Verde(hereinafter referred to as "the Study").

Based on the decision of GOJ, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs, will undertake the Study in close cooperation with the concerned authorities of the GOCV.

The present document sets forth the Scope of Work with regard to the Study.

II OBJECTIVES OF THE STUDY

The objectives of the Study are

1. to formulate action plan(s) for the integrated rural development by the study of Watersheds(hereinafter referred to as WS) on Santiago Island with promoting the effective utilization of natural resources as well the identification and implementation of pilot projects, and

2. to enhance the institutional capacity of national counterpart personnel through on-the-job training in the course of the Study.

III STUDY AREA

The Study will target on WS in Santiago Island. Pilot projects site will be selected at one WS by the Study with following criteria,

- Zones of Agro-Ecology(hereinafter referred to as ZAE),
- Population,
- Micro climate,
- Not financed by others donners,
- Social Impact, and
- Necessity.

The list of Watersheds and location map is attached as ANNEX I, and II.

The list of Watersheds and location map is attached as ANNEX I, and II.

IV SCOPE OF THE STUDY

The Study will consist of the following items:

Phase1

1-1.To define the characteristics of the WSs by field survey,

1-2.To select the model WS with that characteristics,

1-3.To study the natural and socio-economic condition in the model WS,

1-4.To formulate Draft Action Plan, and

1-5.To select the pilot project site in each ZAE.

Phase2

2-1.To examine the validity (technical, economical, and social) of pilot project's activities as follows:

a. To promote appropriate technology for developing new lands for farmers,

b. To implement biological and mechanical measures for the erosion control by reforesting and installing soil and water conservation structures,

c. To review the effective methods of collecting, reserving and managing run off,

d. To apply the effective methods of irrigation water use and management at field level,

e. To diversify farming like ornamental plant, horticulture, fruit-trees, livestock, and agro-silvo-pastoral system,

f. To developer technique adapting to above-mentioned farming diversification,

g. To study value-addition and cost-reducing measures by improving food processing, preservation and transportation of the agricultural products, and

h. To collect natural factors (soil, land use, water, etc) by installing Geographic Information System method as the managing system for WS.

2-2. To examine the appropriate way to extend the results obtained by the pilot projects by taking following measures:

a. To implement technical transfer conducted by the farmers trained in the pilot projects (hereinafter referred to as "core farmers"),

b. To organize pilot projects' site visit for the farmers in other villages,

c. To organize the technical seminar for Counterpart Personnel such as agricultural extension, core farmers and agricultural specialists, and

2-3.To formulate Action Plan by the results of pilot projects.

V STUDY SCHEDULE

The Study will be carried out in accordance with the tentative schedule attached as ANNEX III.

VI REPORTS

JICA shall prepare and submit following reports to the GOCV .
In case any doubt arises in interpretation, English text shall prevail;

Inception Report:	Twenty (20) copies in Portuguese
Interim Report:	Twenty (20) copies in Portuguese
Progress Report(s):	Twenty (20) copies in Portuguese
Draft Final Report:	Five (5) copies in English and thirty (30) copies in Portuguese at the end of the field work. The GOCV will provide JICA with its comments on the Draft Final Report within one (1) month of the receipt of the Draft Final Report.
Final Report:	Ten (10) copies in English and forty (40) copies in Portuguese within two (2) months of the receipt of GOCV's comments on the Draft Final Report.

VII UNDERTAKING OF THE GOVERNMENT OF CAPE VERDE

1. To facilitate the smooth conduct of the Study, GOCV shall take necessary measures:

(1) To permit the members of the Study Team to enter, leave and sojourn in Cape Verde for the duration of their assignments therein and exempt them from foreign registration requirements and consular fees;

(2) To exempt the members of the Study Team from taxes, duties and any other charges on equipment, machinery and other material brought into Cape Verde for the implementation of the Study;

(3) To exempt the members of the Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Study Team for their services in connection with the implementation of the Study; and

(4) To provide necessary facilities to the Study Team for the remittance as well as utilization of the funds introduced into Cape Verde from Japan in connection with the implementation of the Study.

2. GOCV shall bear claims, if any arise, against the members of the Study Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the Study Team.

3. The Ministry of Agriculture and Environment shall, at its own expense, where necessary, provide the Study Team with the following, in cooperation with other organizations concerned:

(1) Security and safety of the Study Team and the relevant information;
(2) Information as well as assistance in obtaining medical service;
(3) Available data (including maps and photographs) and information related to the Study;
(4) Counterpart personnel;
(5) Suitable office space with furniture and telephone facilities; and
(6) Credentials or identification cards.

VIII UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

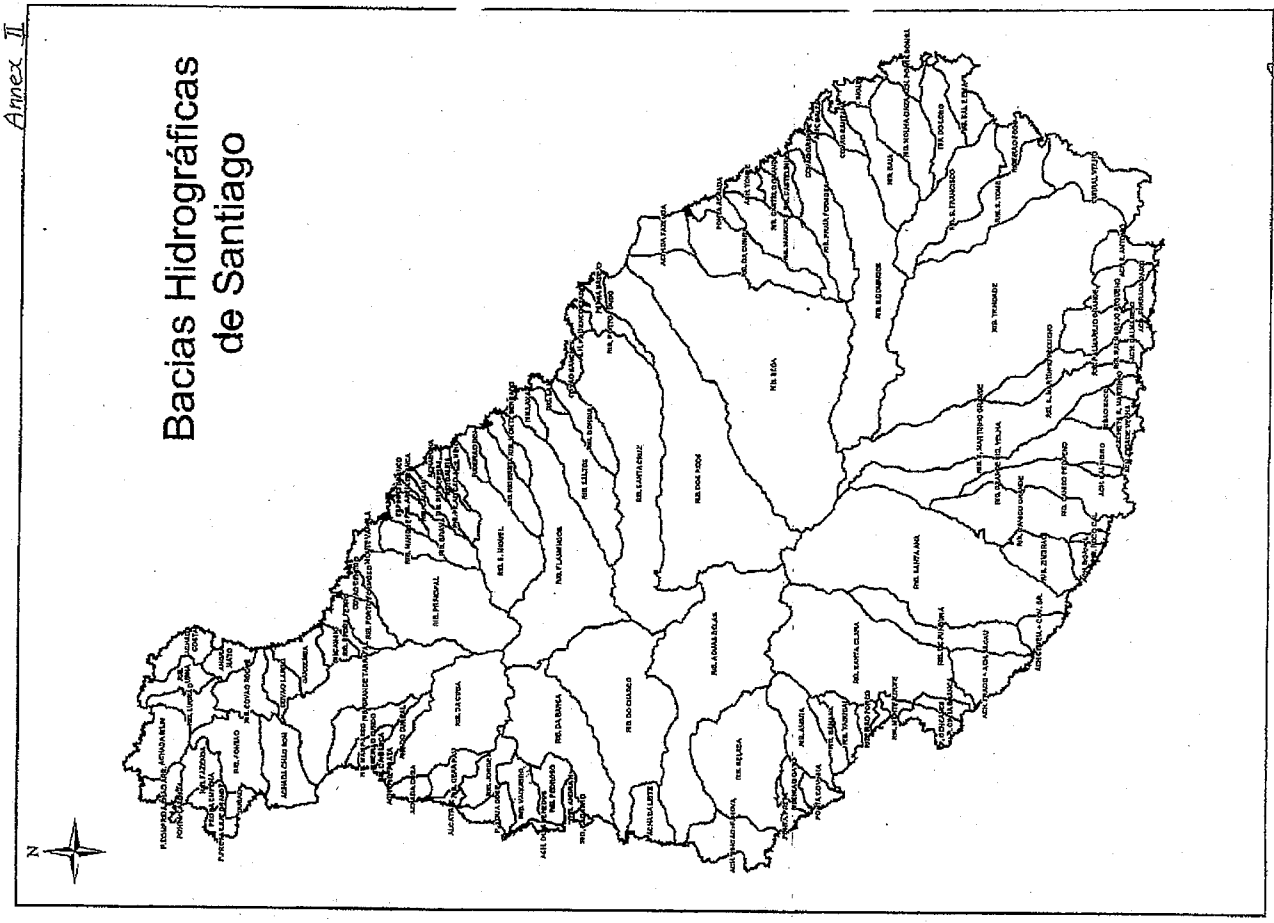
1. To dispatch, at its own expense, a study team to the Republic of Cape Verde; and

2. To pursue technology and skills transfer to the Cape Verde counterpart personnel as well as the communities in the course of the Study.

IX CONSULTATION

JICA and the Ministry of Agriculture and Environment shall consult with each other in respect of any matter that may arise from or in connection with the Study.

Annex II

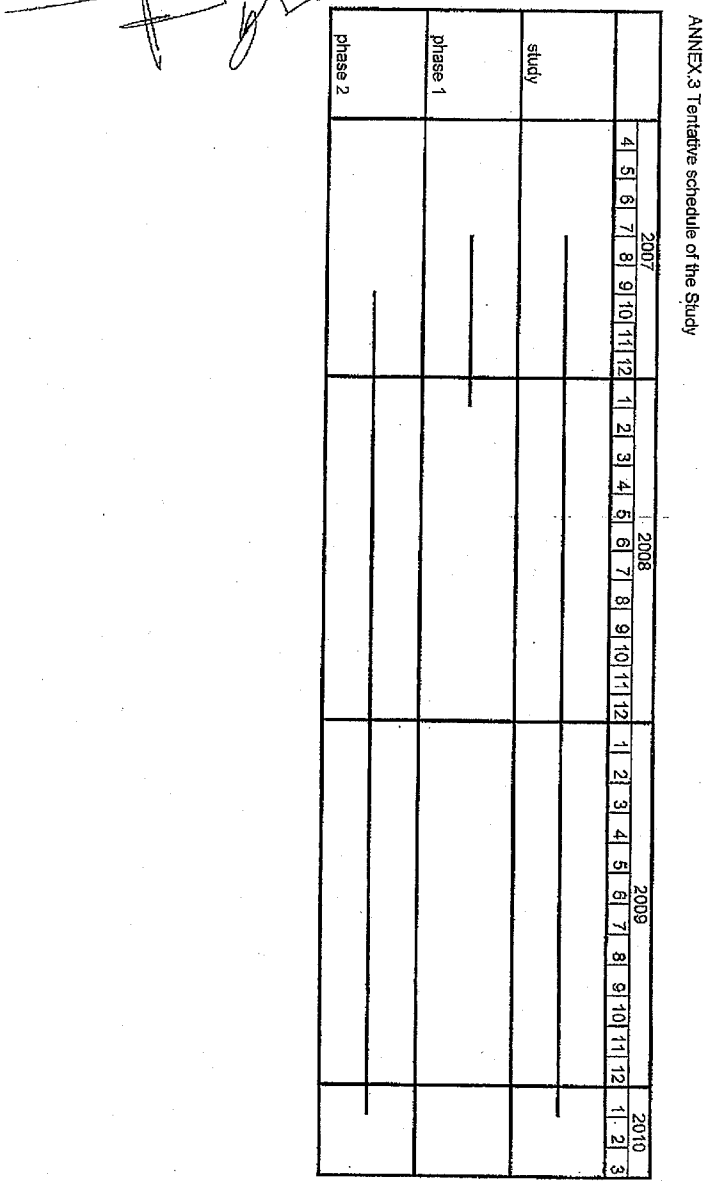


Anexo I: Lista das bacias hidrográficas da ilha de Santiago por ordem de prioridade

Ordem de Prioridade	Bacias Hidrográficas
1	São Domingos
2	Boa Entrada/Sta Cruz
3	São Martinho Grande
4	S. João Baptista
5	Charco
6	Cumba
7	Sta Clara
8	Ganchemba
9	Cuba
10	São Francisco

Annex I

ANNEX.3 Tentative schedule of the Study



ACTA DA REUNIÃO
DO ESTUDO DO DESENVOLVIMENTO RURAL INTEGRADO
DAS BACIAS HIDROGRÁFICAS DA ILHA DE SANTIAGO
DA REPÚBLICA DE CABO VERDE
ASSINADA PELO
MINISTÉRIO DOS NEGÓCIOS ESTRANGEIROS, COOPERAÇÃO E COMUNIDADES
E
MINISTÉRIO DO AMBIENTE E AGRICULTURA
E PELA
AGÊNCIA DE COOPERAÇÃO INTERNACIONAL DO JAPÃO

Praia, 9 de Fevereiro de 2007

Sr. Carlos Monteiro
Director Geral do Planeamento, Orçamento e Gestão
Ministério do Ambiente e Agricultura
República de Cabo Verde

Sr. Takemichi SHIRAI
Chefe da Missão de Estudo Preliminar
Japão

Sr. Antonio Pedro Alves Lopes
Director Geral da Cooperação Internacional
Ministério dos Negócios Estrangeiros, Cooperação e Comunidades
República de Cabo Verde

I. INTRODUÇÃO

Em resposta à solicitação oficial do Governo da República de Cabo Verde (doravante designado "GOCV"), realizou-se uma Missão de Estudo Preliminar (doravante designada "a Missão"), liderada pelo Sr. SHIRAI Takemichi, da Agência de Cooperação Internacional do Japão (doravante designada "JICA"), durante o período de 29 de Janeiro a 10 de Fevereiro de 2007.

A Missão realizou uma série de discussões sobre o Quadro do Estudo relacionado ao Desenvolvimento Rural Integrado das bacias hidrográficas da Ilha de Santiago da República de Cabo Verde (doravante designado "o Estudo"), com os representantes do Ministério do Ambiente e Agricultura (doravante designado "MAA") e outras organizações relacionadas. A lista de participantes das diversas reuniões encontra-se no anexo 1. Tanto a parte Cabo Verdiana como a parte Japonesa estão de acordo com os seguintes itens do Estudo.

II. RESULTADOS DAS DISCUSSÕES

1. Título do Estudo

Ambas as partes estão de acordo que o título do Estudo seja modificado passando de "O Estudo do Desenvolvimento Agrário da Ilha de Santiago da República de Cabo Verde" para "O Estudo do Desenvolvimento Rural Integrado das bacias hidrográficas da Ilha de Santiago da República de Cabo Verde".

2. Objectivos do Estudo

Ambas as partes estão de acordo com os seguintes itens:

(1) O estudo tem como objetivo contribuir para a materialização da estratégia de desenvolvimento da agricultura de Cabo Verde até 2015 e o Programa Nacional de Investimento a Médio Prazo (doravante designado "PNIMT"), enquadrado na Nova Parceria para o Desenvolvimento da África (NEPAD) – Programa Detalhado para o Desenvolvimento Agrícola em África (PDDAA), elaborado pelo GOCV em colaboração com a FAO, em 2005.

(2) O estudo propõe um modelo de gestão dos recursos naturais, com destaque para água, tendo como unidade a Bacia Hidrográfica (doravante designada "BH"), que deverá ser aplicável para todas as outras.

(3) O estudo também propõe um desenvolvimento rural integrado e um modelo agrícola para cada Zona Agroecológica (doravante designada "ZAE"), e também baseados nos resultados obtidos no Estudo. Este modelo deverá ser aplicável para outras ZAE.

3. Objecto do Estudo

O Estudo será realizado em várias BH selecionando uma delas para a implementação do projeto piloto. Este será executado em cada ZAE da BH selecionada, como sendo uma unidade de exploração agrícola e desenvolvimento agrário, para analisar a viabilidade do Plano de Acção e melhorar a capacidade das pessoas relacionadas com o Estudo.

4. Comissão de Gestão

Para a execução eficaz e eficiente do Estudo, ambas as partes concordaram sobre a necessidade de se estabelecer uma Comissão de Gestão presidida pela Direcção-Geral da Agricultura, Silvicultura e Pecuária do MAA, durante a realização do Estudo. Os possíveis membros são:

(a) Parte Cabo Verdiana:

1. Direcção-Geral do Planejamento, Orçamento e Gestão, MAA
2. Direcção-Geral da Agricultura, Silvicultura e Pecuária, MAA
3. Direcção-Geral da Cooperação Internacional, Ministério dos Negócios Estrangeiros, Cooperação e Comunidades
4. INIDA
5. INGRH
6. Câmaras Municipais
7 Delegação, MAA
8. Representantes das Associações Regionais e Locais

(b) Parte Japanesa:

1. Missão de Estudo
2. JICA, Escritório de Senegal
3. Grupo de Estudo de Acompanhamento e Aconselhamento

5. Organização da Contraparte e Pessoal

(1) Ambas as partes confirmam que a Direcção Geral de Planeamento, Orçamento e Gestão (MAA) se responsabilizará pela coordenação, e a Direcção Geral da Agricultura, Silvicultura e Pecuária (MAA), pela implementação do Estudo, com o apoio da Missão de Estudo e JICA.

(2) O MAA compromete designar uma equipa técnica para a Missão de Estudo.

(3) Este estudo será executado com a colaboração das Instituições de pesquisa.

6. Seminários/Workshops

Ambas as partes concordaram que os seminários/workshops devem ser realizados no decorrer do Estudo, como forma de promover a transferência técnológica e aumentar o conhecimento do grupo alvo.

7. Treinamento da Contraparte

1. O MAA solicitou à JICA a realização de treinamento de técnicos nacionais no Japão, bem como treinamento profissional, para possibilitar uma transferência de tecnologia eficaz durante o Estudo. A Missão concordou em examinar esta solicitação.
2. O número de participantes, a área e a duração do treinamento devem ser discutidos após o início do Estudo.

8 Relatórios

Ambas as partes confirmam que o Relatório Final do Estudo deverá ser de conhecimento público.

9. Equipamento e facilidades

O MAA compromete disponibilizar à Missão de Estudo um espaço adequado nas dependências da Direcção-Geral da Agricultura, Silvicultura e Pecuária, e fazer o máximo de esforço para providenciar mobiliários de escritório e telefones. O MAA deve solicitar, junto das autoridades competentes do país, o atendimento das demandas feitas pela Missão de Estudo. O MAA solicitou à JICA o auxílio com os seguintes equipamentos e materiais de estudo. A Missão tomou nota e prometeu submeter a solicitação às autoridades japonesas.

- *Veículos e acessórios*
- *Máquinas fotocopiadoras e acessórios*
- *Computadores, impressoras e acessórios*
- *Outros equipamentos necessários e despesas com o Estudo*

10. Língua

No caso de surgir alguma divergência de interpretação no Quadro de Trabalho e na Acta da Reunião redigidos em inglês e português, deverá prevalecer a versão inglesa.

Anexo 1

LISTA DOS PARTICIPANTES

Parte Cabo Verdiana

Sra. Angela Moreno	Directora Geral da Agricultura, Silvicultura e Pecuária
Sr. Ilidio Furtado	Director dos Serviços de Agricultura e Pecuária
Sr. Clarimundo Gonçalves	Direcção dos Serviços de Agricultura e Pecuária
Sr. Eugenio de Barros	Director dos Serviços de Engenharia Rural
Sra. Cristina Coutinho	Direcção dos Serviços de Engenharia Rural

Parte Japonesa

Missão de Estudo Preliminar

Sr. SHIRAI Takemichi	Chefe
Sr. YAMANAKA Koji	Membro, Sistema Agrícola
Sr. USAMI Junichi	Membro, Preservação do Solo/Planejamento de Gestão de Água
Sr. DOI Hideo	Membro, Avaliação Preliminar/Desenvolvimento da Sociedade Agrária
Sr. WAKABAYASHI Motoharu	Membro, Gestão Planejada
Sra. Suenaga Eunice T. Takahaschi	Membro, Intérprete

MINUTES OF MEETING
FOR
THE STUDY ON
THE INTEGRATED RURAL DEVELOPMENT IN WATERSHED
ON SANTIAGO ISLAND
IN THE REPUBLIC OF CAPE VERDE
AGREED UPON BETWEEN
THE MINISTRY OF FOREIGN AFFAIRES, COOPERATION AND COMMUNITIES,
THE MINISTRY OF AGRICULTURE AND ENVIRONEMENT
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Praia, 9th February, 2007

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Mr.Carlos Monteiro
Director General of Planning, Budget and Management
Ministry of Agriculture and Environment
The Republic of Cape Verde

Mr. Takemichi SHIRAI
Leader of Preparatory Study Team
Japan

Mr. Antonio Pedro Alves Lopes
Director General of Cooperation International
General Directionof International Cooperation
Ministry of Foreign Affairs, Cooperation and Communities
The Republic of Cape Verde

I. INTRODUCTION

In response to an official request from the Government of Cape Verde(hereinafter referred to as "GOCV"), the Preliminary Study Team(hereinafter referred to as "the Team") headed by Mr. SHIRAI Takemichi was sent to the GOCV by Japan International Cooperation Agency(hereinafter referred to as "JICA") from 29 January to 10 February , 2007.

The Team held a series of discussions in relation to the Scope of the Study on the Integrated Rural Development in drainage basins on Santiago Island in the Republic of Cape Verde (hereinafter referred to as "the Study") with the representatives of the Ministry of Agriculture and Environment(hereinafter referred to as "MOAE") and other relevant organizations. The list of participants in the series of meetings is attached as annex 1. The followings were agreed upon by both Cape Verdean and Japanese sides in relation to the Study.

II. RESULTS OF DISCUSSIONS

1. Title of the Study

Both sides agreed that the title of the Study has been changed from "the Study on the Rural Development on Santiago Island in the Republic of Cape Verde" to "the Study on the Integrated Rural Development in drainage basins on Santiago Island in the Republic of Cape Verde."

2. Objectives of the Study

Both sides agreed the following articles:

(1) This Study aims to support the implementation of the strategy for agricultural development in Cape Verde for 2015 and the National Investment Program in middle term (hereinafter referred to as "PNIMT") according to The New Partnership for Africa's Development (NEPAD)-Detailed Agricultural Program for African's Development(PDDAA) elaborated by GOCV in collaboration with FAO in 2005.

(2) This Study proposes the natural resources model, especially water management model by the unit of Watershed(hereinafter referred to as "WS") which will be applicable to all other ones.

(3) This Study also proposes an integrated rural development and farming model for each Zones of Agro-Ecology(hereinafter referred to as ZAE) on the basis of results obtained through the study. This model will be applicable to all other ZAE.

3. Object of the Study

The Study will be conducted in several WSs in order to examine these ones. Pilot project will be implemented in each ZAE of one WS selected by the Study as the rural development and farming unit in order to analyze the validity of Action Plan and enhance of the capacity of those who are concerned with the Study.

4. Steering Committee

For the smooth and effective implementation of the Study, both sides agreed upon the need for establishment of a steering committee chaired by General Direction of Agriculture, Silviculture and

Stockbreeding, MOAE in the course of the Study. Expected participants of the steering committee are as follows:

(a) Cape Verdean Side:

1. General Direction of Planning, Budget and Management, MOAE,
2. General Direction of Agriculture, Silviculture and Stockbreeding, MOAE,
3. Direction General of International Cooperation, Ministry of Foreign Affairs, Cooperation and Communities,
4. INIDA,
5. INGRH,
6. Municipalitis,
7. Direction Regional, MOAE, and
8. Represent of Regional and local association.

(b)Japanese Side:

1. The Study Team,
2. JICA Senegal Office, and
3. Advisory Study Team.

5. Counterpart Organization and Personnel

(1) Both sides confirmed that General Direction of Planning, Budget and Management is responsible coordinating the Study and General Direction of Agriculture, Silviculture and Livestock(MOAE) is responsible implementing the Study with the assistance by the Study team and JICA.

(2) MOAE promised to assign suitable counterpart personnel team for the Study team before the Study starts.

(3) This study will be implemented with the collaboration of some research Institutions.

6. Seminar/Workshops

Both sides agreed that seminars/workshops should be held in the course of the Study in order to promote technical transfer and to raise public awareness.

7. Counterpart Training

1. MOAE requested that JICA conduct the counterpart training in Japan as well as on-the-job-training for the purpose of the smooth transfer of technology during the Study. The Team agreed to examine this request.
2. The number of participants, field and duration of the training shall be discussed after the commencement of the Study.

8 Reports

Both sides confirmed that the Final Report of the Study would be open to the public.

9. Equipment and Facilities

MOAE promised to provide the Study team with a suitable office space within the building of General Direction of Agriculture, Silviculture and Livestock, and to make its best efforts to provide desks, chairs and telephones in the office. MOAE would request the national authorities concerned to facilitate any request called for by the Study team. MOAE requested JICA to support following equipments and materials for the Study. The Team took note and promised to submit the request to Japanese authorities.

- *Vehicles and accessories*
- *Photocopy machines and accessories*
- *Personal computers, printers, and accessories*
- *Other necessary equipments and expenses for the Study*

10. Langue

In any divergence arises about interpretation of the Scope of Work and the Minutes of Meeting which is made in English and Portuguese, the English text shall prevail.

Annex1

LIST OF PARTICIPANTS

Cape Verdean Side

Mr. Ilidio Furtado	Director of Agriculture and Livestock Division
Mr. Clarimundo Gonçalves	Direction of Agriculture and Livestock Division
Mr. Eugenio de Barros	Director of Rural Engineering Division
Ms. Cristina Coutinho	Direction of Rural Engineering Division

Japanese Side

Preliminary Study Team

Mr. SHIRAI Takemichi	Leader
Mr. YAMANAKA Koji	Member, Farming System
Mr. USAMI Junichi	Member, Soil Conservation/ Water Management Planning
Mr. DOI Hideo	Member, Preliminary Evaluation / Rural Society Development
Mr. WAKABAYASHI Motoharu	Member, Planning Management
Ms. Suenaga Eunice Tomomi Takahashi	Member, Interpreter

ACTA DA REUNIÃN
DO ESTUDO DO DESENVOLVIMENTO RURAL INTEGRADO
DAS BACIAS HIDROGRÁFICAS DA ILHA DE SANTIAGO
DA REPÚBLICA DE CABO VERDE

PRAIA, 4 de Fevereiro de 2008

Sr. Emiliano Ramos
Director Geral da Agricultura, Silvicultura e Pecuária
Ministério do Ambiente e Agricultura

Sr. Shigeru Nakada
Chefe, Missão de Estudo
JICA

Sr. Carlos Monteiro
Director Geral do Planeamento, Orçamento e Gestão
Ministério do Ambiente e Agricultura

A Missão de Estudo para o Estudo do Desenvolvimento Rural Integrado das Becias Hidrográficas da ilha de Santiago, republica de Cabo Verde (agora e mais referido como "a Missão de Estudo") despachado pela Agencia de Cooperação Internacional Japonesa (JICA), liderado por Shigeru Nakada, e a comissão de gestão liderado por Emitério Ramos, Director Geral da Agricultura, Silvicultura e Pecuária, Ministério do Ambiente e Agricultura, líder no discurso do relatório da inserção para o estudo de desenvolvimento entregado pela a Missão de Estudo.

A lista dos participantes encontra-se anexada.

1. Submissão do inicio do relatório
   O Ministério do Ambiente e Agricultura, recebeu 20 cópias do Relatório Inicial entregue pela a Missão de Estudo no dia 15 de Janeiro de 2008.

2. Reunião
   Um encontro sobre o Relatório Inicial foi realizado entre a Missão de Estudo e o comité na sala de conferência da Direcção-Geral da Agricultura, Silvicultura e Pecuária, no dia 1 de Fevereiro de 2008.

3. Apresentação
   A Missão de Estudo explicou o Relatório Inicial, que tinha actividades para serem feitas e quadro geral do estudo.

4. Discussão
   Do discutido, a comissão de gestão e a Missão de Estudo acordaram nos conteúdos do relatório mencionado. Entretanto, ressaltaram os seguintes pontos discutidos por ambas as partes:

   (a) Em relação à água de irrigação, o comité fez a sugestão de furos tal como nascentes e precipitação como recurso de água. A Missão de Estudo concordou em considerar a sugestão feita pelo comité.
   (b) Em relação a selecção de candidato de bacias hidrográficas para categorização, o comité sugeriu esta selecção entre as 10 bacias hidrográficas constates do ANEXO I, no âmbito do trabalho acordado no dia 9 de Fevereiro de 2007. A Missão de Estudo concordou com a sugestão.

Em caso de qualquer confusão na interpretação, o texto em inglês será o valido.

LISTA DOS PARTICIPANTES

Data : 1 Fevereiro de 2008
Lugar : Sala de Conferência da Direcção-Geral da Agricultura, Silvicultura e Pecuária

Parte Cabo Verdiana

	nome	posição e organização
1	Emitério Ramos	DG, DGASP
2	Carlos A. S. Monteiro	DG, DGPOG
3	Tatiana Osório	INGRH / Eng. DPEIF
4	Amarildo dos Reis	INIDA / Dept C Ambiente
5	Emilio Sanches	Vereador Câmara Municipal de Santa Cruz
6	Humberto B. Lopes	OASIS Gestor
7	Maria Aleluia Andrade	DGPOG
8	Angela Moreno	DGASP / DSER
9	Cristina Coutiuho	DGASP / DSER
10	Mina Jaglal	DGASP / DSAP
11	Glória Silva	DGASP
12	Eneida Rodrigues	DGASP
13	Luis R. Ledo de Pina	DGASP / DSAP
14	Iolanda Santos	Delegação do MAA em Santa Cruz
15	Moisés Borges	Delegação do MAA no Tarrafal / em São Miguel
16	Augusto Andrade	Delegação do MAA no Praia / São Domingos
17	Idana Funtado	Delegação do MAA em Santa Catarina

Parte Japonesa

	Missão de Estudo, JICA	
18	Shigeru Nakada	Chefe, Missão de Estudo da JICA
19	Hisashi Ikewada	Missão de Estudo da JICA
20	Masato Sako	Missão de Estudo da JICA

MINUTES OF MEETING ON THE INCEPTION REPORT
FOR THE STUDY ON
THE INTEGRATED RURAL DEVELOPMENT IN WATERSHED
ON SANTIAGO ISLAND
IN THE REPUBLIC OF CAPE VERD

PRAIA, FEBRUARY 4, 2008

Mr. Emiterio Ramos
General Director of Agriculture, Forestry and Livestock
Ministry of Environment and Agriculture

Mr. Shigeru Nakada
Leader, JICA Study Team

Mr. Carlos Monteiro
General Director of Planning, Budget and Management
Ministry of Environment and Agriculture

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The Study Team for the Study on the Integrated Rural Development in Watershed on Santiago Island in the Republic of Cape Verde (hereinafter referred to as "the Study Team") dispatched by Japan International Cooperation Agency (JICA), headed by Shigeru NAKADA as Team Leader, and the Steering Committee headed by Mr. Carlos Monteiro, General Director of Planning, Budget and Management, Ministry of Environment and Agriculture, had a discussion on the Inception Report for the Development Study submitted by the Study Team.

The list of participants is attached in Annex.

1. Submission of Inception Report

The Ministry of Environment and Agriculture received 20 copies of the Inception Report submitted by the Study Team on January 15, 2008.

2. Meeting

A meeting on the Inception Report was held between the Study Team and the Steering Committee at the Conference room of the General Directorate of Agriculture, Silviculture and Livestock on the 1st February 2008.

3. Presentation

The Study Team explained the Inception Report that contains the activities to be conducted and the general framework of the Study.

4. Discussion

From the discussion, the Steering Committee and the Study Team confirmed their agreement on the contents of the Inception Report. Meanwhile, the followings are the matters discussed by both parties.

(a) Concerning the water saving irrigation, the Steering Committee suggested considering wells as well as springs and precipitation as water resources. The Study Team agreed to consider this matter in the Study.

(b) Concerning the selection of candidate watersheds for categorization, the Steering Committee suggested that they should be selected from 10 watersheds which had been attached, as ANNEX I, to the Scope of Work signed on the 9th February 2007. The Study Team agreed on this matter.

In case of any discrepancy of interpretation, the English text shall prevail.

LIST OF PARTICIPANTS

Date : 14 April 2004
Venue : Conference Room of General Director of Agriculture, Forestry and Livestock

Cape Verd Side

	Name	Position
1	Emitério Ramos	DG, DGASP
2	Carlos A. S. Monteiro	DG, DGPOG
3	Tatiana Osório	INGRH / Eng. DPEIF
4	Amarildo dos Reis	INIDA / Dept C Ambiente
5	Emilio Sanches	Vereador Câmara Municipal de Santa Cruz
6	Humberto B. Lopes	OASIS Gestor
7	Maria Aleluia Andrade	DGPOG
8	Angela Moreno	DGASP / DSER
9	Cristina Coutiuho	DGASP / DSER
10	Mina Jaglal	DGASP / DSAP
11	Glória Silva	DGASP
12	Eneida Rodrigues	DGASP
13	Luis R. Ledo de Pina	DGASP / DSAP
14	Iolanda Santos	Delegação do MAA em Santa Cruz
15	Moisés Borges	Delegação do MAA no Tarrafal / em São Miguel
16	Augusto Andrade	Delegação do MAA no Praia / São Domingos
17	Idana Funtado	Delegação do MAA em Santa Catarina

Japanese Side

	JICA Study Team	
18	Shigeru Nakada	Team Leader
19	Hisashi Ikewada	Team Member
20	Masato Sako	Team Member

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ACTA DA REUNIÃO PARA APRESENTAÇÃO DO PROJECTO DO PLANO DE ACÇÃO
DO ESTUDO PARA O DESENVOLVIMENTO RURAL INTEGRADO
DAS BACIAS HIDROGRÁFICAS DA ILHA DE SANTIAGO
DA REPÚBLICA DE CABO VERDE

PRAIA, 29 de Julho de 2008

Sr. Emitério Ramos
Director Geral da Agricultura, Silvicultura e Pecuária
Ministério do Ambiente e Agricultura

Sr. Shigeru Nakada
Chefe, Missão de Estudo
JICA

Sr. Carlos Monteiro
Director Geral do Planeamento, Orçamento e Gestão
Ministério do Ambiente e Agricultura

A Missão de Estudo para o Estudo do Desenvolvimento Rural Integrado das Bacias Hidrográficas da ilha de Santiago, República de Cabo Verde (agora e adiante referido como "a Missão de Estudo") despachado pela Agencia de Cooperação Internacional Japonesa (JICA), liderado por Shigeru Nakada, e a comissão de gestão liderado por Emitério Ramos, Director Geral da Agricultura, Silvicultura e Pecuária, Ministério do Ambiente e Agricultura, líder no discurso do Projecto do Plano de Acção para o estudo de desenvolvimento entregado pela Missão de Estudo.

A lista dos participantes encontra-se em anexo.

1. Entrega do Projecto do Plano de Acção

   O Ministério do Ambiente e Agricultura, recebeu 20 cópias do Projecto do Plano de Acção enviada pela a Missão de Estudo no dia 27 de Março de 2008.

2. Reunião

   Um encontro sobre o Projecto do Plano de Acção foi realizado entre a Missão de Estudo e o comité na sala de conferência da Direcção-Geral da Agricultura, Silvicultura e Pecuária, no dia 7 de Julho de 2008.

3. Apresentação

   A Missão de Estudo apresentou o Projecto do Plano de Acção preparado no Japão, baseados nos resultados obtidos na primeira visita efectuada durante o período de Janeiro a Março de 2008. No dia 10 de Junho de 2008, o referido plano foi apresentado á equipa nacional, liderada por Eng.ª Ângela Moreno, onde, durante a apresentação acordaram que a tradução, a linguagem técnica e alguns dados precisavam de ser melhorados e actualizados. Foi emitido um parecer da reunião onde ambas as partes acordaram em trabalhar juntos para correcção e actualização dos referidos dados. Nisto, Eng.ª Ângela, dedicou-se muito a revisão total do referido plano, onde também ficou com uma boa noção do mesmo.

4. Discussão

   Do discutido, a comissão de organização e a Missão de Estudo acordaram nos conteúdos do Projecto do Plano de Acção. Entretanto, os seguintes pontos foram discutidos:

   (a) A Comissão de Gestão sugeriu que os participantes na "Comissão de Gestão para a implementação do plano de acção" devem se manter como foi inicialmente acordado na acta da reunião de 9 de Fevereiro de 2007, deixando de fora o lado japonês.

   A missão de estudo concordou:

   (b) A comissão de organização sugeriu construções de grande porte, como barragens, planta de dessalinização, etc. que deviam ser incluídas no plano de acção tendo em conta a elevada necessidade de água existente em cabo verde.

   A missão de estudo explicou as dificuldades de incluir construções do tipo no plano de acção, porque vai requerer um plano e financiamento específicos, e é difícil assegurar tal financiamento. Por isso, a missão do estudo sugeriu reabilitação das infra-estruturas existentes.

   E a comissão de organização concordou.

Para terminar, a missão de estudo explicou o cronograma do estudo (workshops para a selecção dos projectos pilotos, a preparação e implementação do projecto piloto, etc.), que foi aceite pela comissão de organização.

Em caso de qualquer confusão na interpretação, prevalece o texto em inglês.

LISTA DOS PARTICIPANTES

Data : 7 de Julho de2008
Lugar : Sala de Conferência da Direcção-Geral da Agricultura, Silvicultura e Pecuária

Parte Cabo Verdiana

	Nome	Posição e organização
1	Emitério Ramos	DG, DGASP
2	Carlos A. S. Monteiro	DG, DGPOG
3	João Domingos Correia	Câmara Municipal de Tarráfal
4	Amarildo dos Reis	INIDA / Dept C Ambiente
5	Jorge Mendes Brito	Câmara Municipal de Santa Cruz
6	Humberto B. Lopes	OASIS Gestor
7	João Fonseca	ETER/ DGASP
8	Angela Moreno	DGASP / DSER
9	Moisés Semedo	Câmara de São Domingos
11	Domingos Gonçalves de Barros	Silvicultura / Director
12	Augusto Andrade	Delegação do MAA no Praia / São Domingos

Parte Japonesa

	Missão de Estudo, JICA	
13	Shigeru Nakada	Chefe, Missão de Estudo da JICA
14	Hisashi Ikewada	Missão de Estudo da JICA
15	Masato Sako	Missão de Estudo da JICA
16	Massamba Gueye	Missão de Estudo da JICA

MINUTES OF MEETING ON THE DRAFT ACTION PLAN
FOR THE STUDY ON
THE INTEGRATED RURAL DEVELOPMENT IN WATERSHED
ON SANTIAGO ISLAND
IN THE REPUBLIC OF CAPE VERD

PRAIA, JULY 29, 2008

Mr. Emitério Ramos
General Director of Agriculture,
Forestry and Livestock
Ministry of Environment and Agriculture

Mr. Shigeru Nakada
Leader, JICA Study Team

Mr. Carlos Monteiro
General Director of Planning, Budget and Management
Ministry of Environment and Agriculture

The Study Team for the Study on the Integrated Rural Development in Watershed on Santiago Island in the Republic of Cape Verde (hereinafter referred to as "the Study Team") dispatched by Japan International Cooperation Agency (JICA), headed by Shigeru NAKADA as Team Leader, and the Steering Committee headed by Mr. Emitério Ramos, General Director of Agriculture, Forestry and Livestock, Ministry of Environment and Agriculture, had a discussion on the Draft Action Plan for the Development Study submitted by the Study Team.

The list of participants is attached in Annex.

1. Submission of Draft Action Plan

The Ministry of Environment and Agriculture received 20 copies of the Draft Action Plan sent by the Study Team on March 27, 2008.

2. Meeting

A meeting on the Draft Action Plan was held between the Study Team and the Steering Committee at the Conference room of the General Directorate of Agriculture, Forestry and Livestock on the 7th of July 2008.

3. Presentation

The Study Team explained the Draft Action Plan formulated in compliance with the results of the first field study conducted in January to March 2008, which had been revised in accordance with the comments made on the 10th of June 2008 by the national technical team of DGASP led by Mrs. Angela. The presentation of the technical matters was made directly in Portuguese by Mrs. Angela who entirely devoted herself in the revision of the Draft Action Plan with the JICA Study Team and was well acquainted with its contents.

4. Discussion

From the discussion, the Steering Committee and the Study Team confirmed their agreement on the contents of the Draft Action Plan. Meanwhile, the followings are the matters discussed by both parties.

(a) The Steering Committee suggested that the participants in the "Steering Committee in the implementation organization of the Action Plan" shall be the same as written in the Minutes of Meeting signed on the 9th of February 2007, excluding the Japanese side.
The Study Team agreed on this matter.

(b) The Steering Committee suggested that the construction of big-scale civil facilities such as dams, desalination plants, etc., should he included in the Action Plan taking into account the serious water resources' shortage in Cape Verde.
The Study Team explained the difficulty to include such facilities in the Action Plan, which will require a concrete plan with an actual budget source for a specific time frame, and it was difficult to secure such a budget for these big-scale civil facilities. Therefore, the Study Team suggested that the Action Plan should instead include the rehabilitation of the existing facilities.
The Steering Committee agreed.

(c) After the discussion, the Study Team explained the schedule of the study (workshops for selection of Pilot Projects, implementation design of Pilot Projects, etc.), which was accepted by the Steering Committee.

In case of any discrepancy of interpretation, the English text shall prevail.

LISTA DOS PARTICIPANTES

Data : 7 July 2008
Lugar : Conferenc Room of General Director of Agriculture, Forestry and Livestock

Cabo Verdien Side

	Name	Position
1	Emitério Ramos	DG, DGASP
2	Carlos A. S. Monteiro	DG, DGPOG
3	João Domingos Correia	Câmara Municipal de Tarráfal
4	Amarildo dos Reis	INIDA / Dept C Ambiente
5	Jorge Mendes Brito	Câmara Municipal de Santa Cruz
6	Humberto B. Lopes	OASIS Gestor
7	João Fonseca	ETER/ DGASP
8	Angela Moreno	DGASP / DSER
9	Moisés Semedo	Câmara de São Domingos
10	Domingos Gonçalves de Barros	Silvicultura / Director
11	Augusto Andrade	Delegação do MAA no Praia / São Domingos

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Japanese Side

	JICA Study Team	
12	Shigeru Nakada	Chefe, Missão de Estudo da JICA
13	Hisashi Ikewada	Missão de Estudo da JICA
14	Massamba Gueye	Missão de Estudo da JICA
15	Masato Sako	Missão de Estudo da JICA
16	Antonio Fernandes	Intérpret

ACTA DA REUNIÃO PARA APRESENTAÇÃO DO RELATÓRIO DE EVOLUÇÃO (1)
DO ESTUDO PARA O DESENVOLVIMENTO RURAL INTEGRADO
DAS BACIAS HIDROGRÁFICAS DA ILHA DE SANTIAGO
DA REPÚBLICA DE CABO VERDE

PRAIA, 8 de Agosto de 2008

Sr. Emitério Ramos
Director Geral da Agricultura, Silvicultura e Pecuária
Ministério do Ambiente e Agricultura

Sr. Shigeru Nakada
Chefe, Missão de Estudo
JICA

Sr. Carlos Monteiro
Director Geral do Planeamento, Orçamento e Gestão
Ministério do Ambiente e Agricultura

A Missão de Estudo para o Estudo do Desenvolvimento Rural Integrado das Bacias Hidrográficas da ilha de Santiago, República de Cabo Verde (agora e adiante referido como "a Missão de Estudo"), despachado pela Agencia de Cooperação Internacional Japonesa (JICA), liderado por Shigeru Nakada, e a comissão de gestão liderado por Emitério Ramos, Director Geral da DGASP (Direcção Geral da Agricultura Silvicultura e Pecuária) Ministério do Ambiente e Agricultura, organizaram uma discussão do Relatório de Evolução (1) do referido estudo em execução pela Missão de Estudo.

A lista dos participantes encontra-se em anexo.

1. Entrega do Relatório de Evolução (1)
   O Ministério do Ambiente e Agricultura, recebeu 20 cópias do Relatório de Evolução (1) entregue pela a Missão de Estudo no dia 5 de Agosto de 2008.

2. Reunião
   Um encontro para apresentação do Relatório de Evolução (1) foi realizado entre a Missão de Estudo e o comité na sala de conferência da Direcção-Geral da Agricultura, Silvicultura e Pecuária, no dia 7 de Agosto de 2008.

3. Apresentação
   A Missão de Estudo apresentou o Relatório de Evolução (1) baseados nos resultados obtidos na primeira visita efectuada durante o período de Junho a Agosto de 2008.

4. Discussão
   Do discutido, a comissão de gestão e a Missão de Estudo acordaram nos conteúdos do Relatório de Evolução (1). Entretanto, os seguintes pontos foram discutidos:

   (a) A comissão de gestão perguntou se o governo de Cabo Verde tinha que disponibilizar qualquer verba para a implementação do projecto-piloto.
   A Missão de Estudo respondeu que, o Governo de Cabo Verde deve singir ao "COMPROMISSO DO GOVERNO DE CABO VERDE " estipulado no quadro de trabalho assinado em 9 de Fevereiro de 2007, pelo Governo de Cabo Verde e a Agencia Internacional Cooperação Japonesa (JICA), e se para cumprir o COMPROMISSO for necessário preparar um orçamento o Governo de Cabo Verde assim o fará.
   A comissão de gestão aceitou a resposta.

   (b) A comissão de gestão sugeriu que durante a implementação do projecto-piloto, aparecerão necessidades de se introduzir novos componentes no plano de acção.
   A Missão de Estudo aceitou a sugestão, e explicou que se em caso isso acontecesse, os componentes aparecidos vão ser incluídos no plano de acção.

(c) A comissão de gestão queria confirmar se o plano de acção em elaboração, ia ser estendida a outras bacias da Ilha de Santiago.
A Missão de Estudo explicou que o plano de acção foi elaborado visando estas extensões, até no projecto-piloto existe um componente para fazer a tal extensão.

Em caso de qualquer confusão na interpretação, prevalece o texto em inglês.

LISTA DOS PARTICIPANTES

Data : 7 de Agosto de2008
Lugar : Sala de Conferência da Direcção-Geral da Agricultura, Silvicultura e Pecuária

Parte Cabo Verdiana

	Nome	Posição e organização
1	Emitério Ramos	DG, DGASP
2	Carlos A. S. Monteiro	DG, DGPOG
3	Carla Tavares	DGASP / DSAP
4	Mina Teixira	DGASP / DSAP
5	Ilidio Furtado	DGASP / DSAP
6	Celestino Evra	DGASP / DSER
7	Alberto Salazar da Silva	DGASP / DSS
8	Miryan Vieira	DGCI/MNEC
9	Augusto Andrade	Delegação do MAA no Praia / São Domingos
10	Daniel Xavier Da Luz	Delegação do MAA no Santa Catarina
11	Amarildo dos Reis	INIDA / Dept C Ambiente
12	Arrigo H. F. Querido	INGRH
13	Jorge Mendes Brito	Câmara Municipal de Santa Catarina
14	Anildo Gomes Tavares	Câmara Municipal de São Miguel
15	Paula Da Veiga	Câmara Municipal de Ribeira Grande
16	Humberto B. Lopes	OASIS Gestor

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Japanese Side

	JICA Study Team	
17	Shigeru Nakada	Chefe, Missão de Estudo da JICA
18	Hisashi Ikewada	Missão de Estudo da JICA
19	Massamba Gueye	Missão de Estudo da JICA
20	Masato Sako	Missão de Estudo da JICA
21	Antonio Fernandes	Intérpret

MINUTES OF MEETING ON THE PROGRESS REPORT (1)
FOR THE STUDY ON
THE INTEGRATED RURAL DEVELOPMENT IN WATERSHED
ON SANTIAGO ISLAND
IN THE REPUBLIC OF CAPE VERD

PRAIA, AUGUST 8, 2008

Mr. Emitério Ramos
General Director of Agriculture, Forestry and Livestock
Ministry of Environment and Agriculture

Mr. Shigeru Nakada
Leader, JICA Study Team

Mr. Carlos Monteiro
General Director of Programme, Budget and Management
Ministry of Environment and Agriculture

The Study Team for the Study on the Integrated Rural Development in Watershed on Santiago Island in the Republic of Cape Verde (hereinafter referred to as "the Study Team") dispatched by Japan International Cooperation Agency (JICA), headed by Shigeru NAKADA as Team Leader, and the Steering Committee headed by Mr. Emitério Ramos, General Director of Agriculture, Forestry and Livestock, Ministry of Environment and Agriculture, had a discussion on the Progress Report (1) for the Development Study submitted by the Study Team.

The list of participants is attached in Annex.

1. Submission of Progress Report (1)

The Ministry of Environment and Agriculture received 20 copies of the Progress Report (1) submitted by the Study Team on August 5, 2008.

2. Meeting

A meeting on the Progress Report (1) was held between the Study Team and the Steering Committee at the Conference room of the General Directorate of Agriculture, Forestry and Livestock on the 7th of August 2008.

3. Presentation

The Study Team explained the Progress Report (1) formulated in compliance with the results of the second field study conducted in June to August 2008.

4. Discussion

From the discussion, the Steering Committee and the Study Team confirmed their agreement on the contents of the Progress Report (1). Meanwhile, the followings are the matters discussed by both parties.

(a) The Steering Committee raised the question whether or not the Government of Cape Verde needed to prepare any budget for the implementation of the Pilot Projects.
The Study Team answered that the Government of Cape Verde shall perform the "UNDERTAKING OF THE GOVERNMENT OF CAPE VERDE" stipulated in the Scope of Work signed on the 9th of February 2007 by the Government of Cape Verde and the Japan International Cooperation Agency, and to perform this UNDERTAKING, the Government of Cape Verde needs to prepare a budget, if the situation requires.
The Steering Committee accepted the answer.

(b) The Steering Committee suggested that some necessary new components of the Action Plan would appear during the implementation of the Pilot Projects.
The Study Team accepted this suggestion, and explained that in such case, the newly appeared components would be included in the Action Plan.

(c) The Steering Committee wanted to confirm whether or not the Action Plan drawn up would be extended to the other watersheds in Santiago Island.
The Study Team explained that the Action Plan had been drawn up foreseeing such an extension, and even in the Pilot Projects, there was a component to perform that extension.

In case of any discrepancy of interpretation, the English text shall prevail.

LIST OF PARTICIPANTS

Data : 7 August 2008
Lugar : Conferenc Room of General Director of Agriculture, Forestry and Livestock

Cape Verdien Side

	Name	Position
1	Emitério Ramos	DG, DGASP
2	Carlos A. S. Monteiro	DG, DGPOG
3	Carla Tavares	DGASP / DSAP
4	Mina Teixira	DGASP / DSAP
5	Ilidio Furtado	DGASP / DSAP
6	Celestino Evra	DGASP / DSER
7	Alberto Salazar da Silva	DGASP / DSS
8	Miryan Vieira	DGCI/MNEC
9	Augusto Andrade	Delegação do MAA no Praia / São Domingos
10	Daniel Xavier Da Luz	Delegação do MAA no Santa Catarina
11	Amarildo dos Reis	INIDA / Dept C Ambiente
12	Arrigo H. F. Querido	INGRH
13	Jorge Mendes Brito	Câmara Municipal de Santa Catarina
14	Anildo Gomes Tavares	Câmara Municipal de São Miguel
15	Paula Da Veiga	Câmara Municipal de Ribeira Grande
16	Humberto B. Lopes	OASIS Gestor

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Japanese Side

	JICA Study Team	
17	Shigeru Nakada	Chefe, Missão de Estudo da JICA
18	Hisashi Ikewada	Missão de Estudo da JICA
19	Massamba Gueye	Missão de Estudo da JICA
20	Masato Sako	Missão de Estudo da JICA
21	Antonio Fernandes	Intérpret

ACTA DA REUNIÃO PARA APRESENTAÇÃO DO RELATÓRIO D'EVOLUÇÃO (2)
DO ESTUDO PARA O DESENVOLVIMENTO RURAL INTEGRADO
DAS BACIAS HIDROGRÁFICAS DA ILHA DE SANTIAGO
DA REPÚBLICA DE CABO VERDE

PRAIA, 23 de Fevereiro de 2009

Sr. Emitério Ramos
Director Geral da Agricultura, Silvicultura e Pecuária
Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos

Sr. Shigeru Nakada
Chefe, Missão de Estudo
JICA

Sr. Clarimundo Gonçalves
Director Geral do Planeamento, Orçamento e Gestão
Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos

A Missão de Estudo para o Estudo do Desenvolvimento Rural Integrado das Bacias Hidrográficas da ilha de Santiago, República de Cabo Verde (agora e adiante referido como "a Missão de Estudo"), despachado pela Agencia de Cooperação Internacional Japonesa (JICA), liderado por Shigeru Nakada, e a comissão de gestão liderado por Emitério Ramos, Director Geral da DGASP (Direcção Geral da Agricultura Silvicultura e Pecuária) Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos, organizaram uma discussão do Relatório de Evolução (2) do referido estudo em execução pela Missão de Estudo.

A lista dos participantes encontra-se em anexo.

1. Entrega do Relatório de Evolução (2)
   O Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos, recebeu 20 cópias do Relatório de Evolução (2) entregue pela a Missão de Estudo no dia 19 de Fevereiro de 2009.

2. Reunião
   Um encontro para apresentação do Relatório de Evolução (2) foi realizado entre a Missão de Estudo e o comité na sala de reunião da Direcção-Geral da Agricultura, Silvicultura e Pecuária, no dia 23 de Fevereiro de 2009.

3. Apresentação
   A Missão de Estudo apresentou o Relatório de Evolução (2) baseado nos resultados obtidos na primeira visita efectuada durante o período de Outubro a Março de 2009.

4. Discussão
   Do discutido, a comissão de gestão e a Missão de Estudo acordaram nos conteúdos do Relatório de Evolução (2). Entretanto, os seguintes pontos foram resalvados:

(a) A missão de Estudo requereu-a contraparte Cabo-verdiana para adequadamente, conparticipar na construção dos empreendimentos para os projectos pilotos, assim como tinham acordado as duas partes no aspecto financeiro.

(b) A missão de Estudo disse que as obras planeadas e desenhados poderão sofrer alteracões após a consideração em Japão.

Em caso de qualquer confusão na interpretação, prevalece o texto em inglês.

LISTA DOS PARTICIPANTES

Data : 23 de Fevereiro de2009
Lugar : Sala de Conferência da Direcção-Geral da Agricultura, Silvicultura e Pecuária

Parte Cabo Verdiana

	Nome	Posição e Organização
1	Emitério Ramos	DG, DGASP
2	Ângela Moreno	DGASP / DSER (Cood. do Projetcto JICA / DGASP)
3	Carla Tavares	DGASP / DSAP
4	Mina Teixira	DGASP / DSAP
5	Alberto Salazar da Silva	DGASP / DSS
6	Moisés Borges	Delegação do MAA no Tarrafal
7	Augusto Andrade	Delegação do MADRRM no Praia / São Domingos
8	Idana Furtado	Delegação do MADRRM no Praia / São Domingos
9	Alcina Almeida	Delegação do MADRRM no Praia / São Domingos
10	Daniel Xavier Da Luz	Delegação do MADRRM no Santa Cruz
11	Samuel Gomes	INIDA / Dept C Ambiente
12	Arrigo H. F. Querido	INGRH
13	Jorge Mendes Brito	Câmara Municipal de Santa Catarina
14	José Jorge Barros	Câmara Municipal de São Domingos
15	Aniceto Tavares	Câmara Municipal de São Miguel
16	Humberto B. Lopes	OASIS Gestor

Japanese Side

	JICA Study Team	
17	Shigeru Nakada	Chefe, Missão de Estudo da JICA
18	Masato Sako	Missão de Estudo da JICA
19	Antonio Fernandes	Intérpret

MINUTES OF MEETING ON THE PROGRESS REPORT (2)
FOR THE STUDY ON
THE INTEGRATED RURAL DEVELOPMENT IN WATERSHED
ON SANTIAGO ISLAND
IN THE REPUBLIC OF CAPE VERD

PRAIA, FEBRUARY 23, 2009

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Mr. Emitério Ramos
General Director of Agriculture, Forestry and Livestock
Ministry of Environment, Rural Development and Marine Resources

Mr. Shigeru Nakada
Leader, JICA Study Team

Mr. Clarimundo Gonçalves
General Director of Planning, Budget and Management
Ministry of Environment, Rural Development and Marine Resources

The Study Team for the Study on the Integrated Rural Development in Watershed on Santiago Island in the Republic of Cape Verde (hereinafter referred to as "the Study Team") dispatched by Japan International Cooperation Agency (JICA), headed by Shigeru NAKADA as Team Leader, and the Steering Committee headed by Mr. Emitério Ramos, General Director of Agriculture, Forestry and Livestock, Ministry of Environment, Rural Development and Marine Resources, had a discussion on the Progress Report (2) for the Development Study submitted by the Study Team.

The list of participants is attached in Annex.

1. Submission of Progress Report (2)

The Ministry of Environment, Rural Development and Marine Resources received 20 copies of the Progress Report (2) submitted by the Study Team on the 19th February 2009.

2. Meeting

A meeting on the Progress Report (2) was held between the Study Team and the Steering Committee at the Conference room of the General Directorate of Agriculture, Forestry and Livestock on the 23rd of February 2009.

3. Presentation

The Study Team explained the Progress Report (2) formulated in compliance with the results of the second field study conducted from October 2008 to March 2009.

4. Discussion

From the discussion, the Steering Committee and the Study Team confirmed their agreement on the contents of the Progress Report (2). Meanwhile, the followings are the matters confirmed by both parties.

(a) The Study Team requested the Cape Verde side to properly carry out his part of construction of the Pilot Projects' facilities which had been agreed by both sides to be executed jointly in the financial aspect.

(b) The Study Team stated that the facilities planned and designed in the Pilot Projects could be changed after the consideration in Japan.

In case of any discrepancy of interpretation, the English text shall prevail.

LIST OF PARTICIPANTS

Data : 23 February 2009
Lugar : Conferenc Room of General Director of Agriculture, Forestry and Livestock

Cape Verdien Side

	Name	Position
1	Emitério Ramos	DG, DGASP
2	Ângela Moreno	DGASP / DSER (Cood. of JICA / DGASP Projetct)
3	Carla Tavares	DGASP / DSAP
4	Mina Teixira	DGASP / DSAP
5	Alberto Salazar da Silva	DGASP / DSS
6	Moisés Borges	Delegação do MAA no Tarrafal
7	Augusto Andrade	Delegação do MADRRM no Praia / São Domingos
8	Idana Furtado	Delegação do MADRRM no Praia / São Domingos
9	Alcina Almeida	Delegação do MADRRM no Praia / São Domingos
10	Daniel Xavier Da Luz	Delegação do MADRRM no Santa Cruz
11	Samuel Gomes	INIDA / Dept C Ambiente
12	Arrigo H. F. Querido	INGRH
13	Jorge Mendes Brito	Câmara Municipal de Santa Catarina
14	José Jorge Barros	Câmara Municipal de São Domingos
15	Aniceto Tavares	Câmara Municipal de São Miguel
16	Humberto B. Lopes	OASIS Gestor

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Japanese Side

	JICA Study Team	
17	Shigeru Nakada	Chefe, Missão de Estudo da JICA
18	Masato Sako	Missão de Estudo da JICA
19	Antonio Fernandes	Intérpret

ACTA DA REUNIÃO PARA APRESENTAÇÃO DO RELATÓRIO INTERINO
DO ESTUDO PARA O DESENVOLVIMENTO RURAL INTEGRADO
DAS BACIAS HIDROGRÁFICAS DA ILHA DE SANTIAGO
DA REPÚBLICA DE CABO VERDE

PRAIA, 16 de Junho de 2009

Sr. Emitério Ramos
Director Geral da Agricultura, Silvicultura e Pecuária
Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos

Sr. Shigeru Nakada
Chefe, Missão de Estudo
JICA

Sr. Clarimundo Gonçalves
Director Geral do Planeamento, Orçamento e Gestão
Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos

A Missão de Estudo para o Estudo do Desenvolvimento Rural Integrado das Bacias Hidrográficas da ilha de Santiago, República de Cabo Verde (agora e adiante referido como "a Missão de Estudo"), despachado pela Agencia de Cooperação Internacional Japonesa (JICA), liderado por Shigeru Nakada, e a comissão de gestão liderado por Emitério Ramos, Director Geral da DGASP (Direcção Geral da Agricultura Silvicultura e Pecuária) Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos, organizaram uma discussão do Relatório Interino do referido estudo em execução pela Missão de Estudo.
A lista dos participantes encontra-se em anexo.

1. Entrega do Relatório Interino

O Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos, recebeu 20 cópias do Relatório Interino entregue pela a Missão de Estudo no dia 25 de Maio de 2009.

2. Reunião

Um encontro para apresentação do Relatório Interino foi realizado entre a Missão de Estudo e o comité na sala de reunião da Direcção-Geral da Agricultura, Silvicultura e Pecuária, no dia 15 de Junho de 2009.

3. Apresentação

A Missão de Estudo apresentou o Relatório Interino baseado nos resultados já obtidos do Estudo até esta altura.

4. Discussão

Do discutido, a comissão de gestão e a Missão de Estudo acordaram nos conteúdos do Relatório Interino. Entretanto, os seguintes pontos foram ressalvados:

(a) O comité de pilotagem revelou que as terminologias portuguesas foram melhoradas em comparação com os dois relatórios apresentado inicialmente (Relatório inicial e Relatório de Evolução), contudo, ainda existe algumas confusas neste Relatório interino, e deve ser corrigidas antes da preparação do Relatório final em colaboração com os homólogos nacionais. A Missão de Estudo concordou e expressou a sua elevada vontade de melhor as terminologias portuguesas.

(b) O Director Geral do Planeamento Orçamento e Gestão, agradeceu a Equipa de Estudo pela apresentação feita pelo chefe da equipa, e colocou algumas questões relacionaldas com o objectivo inicial do projecto, que segundo este, o documento rubricado proponha um estudo integral de três bacias na ilha de Santiago com definições claras dos projectos detalhados. Os três estudos deveriam culminar em projectos bancáveis a serem apresentados a outros doadores financeiros. Ainda acrescentou que dês do início ficou claro que o governo do Japão não iria financiar as grandes obras, mas sim pequenos projectos-piloto nas diferentes zonas agro-ecologicas da bacia seleccionada.

(c) Um dos participantes, mesmo tendo explicado a questão na reunião anterior, perguntou, porque é que João Garrido não recebeu qualquer projecto-piloto no âmbito de conservação de solo e água, questão esse que também foi esclarecido por um dos membros da comité de pilotagem e assim ficou entendido.

(d) Em relação à difusão dos bons resultados do projecto-piloto às outras bacias na ilha de Santiago através de "workshop" como foi anunciado pela Missão de estudo, o Comité de Pilotagem sugeriu o uso da televisão para tal difusão, e tambem revelou que a DGASP possui um departamento capaz de cuidar de tal meio. A Missão de Estudo compreendeu e respeitou essa sugestão e prometeu considera-la.

Em caso de qualquer confusão na interpretação, prevalece o texto em inglês.

LISTA DOS PARTICIPANTES

Data : 15 de Maio de2009
Lugar : Sala de Conferência da Direcção-Geral da Agricultura, Silvicultura e Pecuária

Parte Cabo Verdiana

Nome	Posição e Organização
Emitério Ramos	DG, DGASP
Clarimundo Gonçalves	DG, DGPOG
Ângela Moreno	DGASP / DSER (Cood. do Projetcto JICA / DGASP)
Eugénio Barros	DGASP/ Eng. Rural
Mina Teixeira	DGASP / DSAP
José Martins	DGASP
Eneida Rodrigues	DGASP / DSAP
Conceição Moreno	DGASP/DSS
João Fonseca	DGASP/ETER
Augusto Andrade	Delegação do MADRRM no Praia / São Domingos
José Gonçalves	Delegação do MADRRM no Praia / São Domingos
Alcina Almeida	Delegação do MADRRM no Praia / São Domingos
Daniel Xavier Da Luz	Delegação do MADRRM no Santa Cruz
Oumar Barry	Delegado substituto Santa Catarina
Maria Lurdes Lima	INGRH
Jorge Mendes Brito	Câmara Municipal de Santa Catarina
Moisés Semedo	Câmara Municipal de São Domingos
Aniceto Tavares	Câmara Municipal de São Domingos
Vitorino Narso	Agrónomo

Japanese Side

JICA Study Team	
Shigeru Nakada	Chefe, Missão de Estudo da JICA
Masato Sako	Missão de Estudo da JICA
Shingo Ueno	Missão de Estudo da JICA
Antonio Fernandes	Intérpret

MINUTES OF MEETING ON THE INTERIM REPORT
FOR THE STUDY ON
THE INTEGRATED RURAL DEVELOPMENT IN WATERSHED
ON SANTIAGO ISLAND
IN THE REPUBLIC OF CAPE VERD

PRAIA, June 16, 2009

Mr. Emitério Ramos
General Director of Agriculture, Forestry and Livestock
Ministry of Environment, Rural Development and Marine Resources

Mr. Shigeru Nakada
Leader, JICA Study Team

Mr. Clarimundo Gonçalves
General Director of Planning, Budget and Management
Ministry of Environment, Rural Development and Marine Resources

The Study Team for the Study on the Integrated Rural Development in Watershed on Santiago Island in the Republic of Cape Verde (hereinafter referred to as "the Study Team") dispatched by Japan International Cooperation Agency (JICA), headed by Shigeru NAKADA as Team Leader, and the Steering Committee headed by Mr. Emitério Ramos, General Director of Agriculture, Forestry and Livestock, Ministry of Environment, Rural Development and Marine Resources, had a discussion on the Interim Report for the Development Study submitted by the Study Team.

The list of participants is attached in Annex.

1. Submission of Interim Report

The Ministry of Environment, Rural Development and Marine Resources received 20 copies of the Interim Report submitted by the Study Team on the 25th May 2009.

2. Meeting

A meeting on the Interim Report was held between the Study Team and the Steering Committee at the Conference room of the General Directorate of Agriculture, Forestry and Livestock on the 15th of June 2009.

3. Presentation

The Study Team explained the Interim Report formulated in compliance with the results of the Study conducted so far.

4. Discussion

From the discussion, the Steering Committee and the Study Team confirmed their agreement on the contents of the Interim Report. Meanwhile, the followings are the matters confirmed by both parties.

(a) The Steering Committee suggested that the terminologies in Portuguese had been improved compared with the early reports (Inception Report and Draft Action Plan), however there were still some misuse in this Interim Report, and it should be improved before the preparation of Draft Final Report with the collaboration of the counterparts. The Study Team agreed and expressed his desire to improve the terminologies in Portuguese.

(b) General Director of DGPOG thanked the study team for the presentation and posed some questions related to the initial objective of the project; which, according to his understanding, the signed document attached to the Interim Report proposed an integrated study of three watersheds in the Santiago Island with a clear definition of detailed projects, and those three studies should produce a result in reference projects that can be presented to other donors for financing. He also added that, it had been clear from the beginning that the Japanese Government would not finance big infrastructures, but small pilot-projects in the different agro-ecological zones of the selected watershed.

(c) One of the Steering Committee members raised a question why Joãn Garido did not have the pilot project with facilities. Another member explained how the pilot projects and their concerned associations were selected and the one who raised the question accepted the explanation.

(d) Concerning the extension of the good results of Pilot Project to other watersheds in Santiago Island through a workshop which had been explained by the Study Team, the Steering Committee suggested that the television would be a useful effective medium of such extension and stated that DGASP has a section for handling such medium. The Study Team understood and respected the suggestion and promised to consider it.

In case of any discrepancy of interpretation, the English text shall prevail.

LIST OF PARTICIPANTS

Data : 15 May 2009
Lugar : Conference Room of General Director of Agriculture, Forestry and Livestock

Cape Verdien Side

Name	Position
Emitério Ramos	DG, DGASP
Clarimundo Gonçalves	DG, DGPOG
Ângela Moreno	DGASP / DSER (Cood. do Projetcto JICA / DGASP)
Eugénio Barros	DGASP/ Eng. Rural
Mina Teixeira	DGASP / DSAP
José Martins	DGASP
Eneida Rodrigues	DGASP / DSAP
Conceição Moreno	DGASP/DSS
João Fonseca	DGASP/ETER
Augusto Andrade	Delegação do MADRRM no Praia / São Domingos
José Gonçalves	Delegação do MADRRM no Praia / São Domingos
Alcina Almeida	Delegação do MADRRM no Praia / São Domingos
Daniel Xavier Da Luz	Delegação do MADRRM no Santa Cruz
Oumar Barry	Delegado substituto Santa Catarina
Maria Lurdes Lima	INGRH
Jorge Mendes Brito	Câmara Municipal de Santa Catarina
Moisés Semedo	Câmara Municipal de São Domingos
Aniceto Tavares	Câmara Municipal de São Domingos
Vitorino Narso	Agrónomo

Japanese Side

JICA Study Team	
Shigeru Nakada	Chefe, Missão de Estudo da JICA
Masato Sako	Missão de Estudo da JICA
Shingo Ueno	Missão de Estudo da JICA
Antonio Fernandes	Intérpret

ACTA DA REUNIÃO PARA APRESENTAÇÃO DO RELATÓRIO DE EVOLUÇÃO (3)
DO ESTUDO PARA O DESENVOLVIMENTO RURAL INTEGRADO
DAS BACIAS HIDROGRÁFICAS DA ILHA DE SANTIAGO
DA REPÚBLICA DE CABO VERDE

PRAIA, 25 de Fevereiro de 2010

Sr. Emitério Ramos
Direetor Geral da Agricultura, Silvicultura e Pecuária
Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos

Sr. Shigeru Nakada
Chefe, Missão de Estudo
JICA

Sr. Clarimundo Gonçalves
Director Geral do Planeamento, Orçamento e Gestão
Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos

A Missão de Estudo para o Estudo do Desenvolvimento Rural Integrado das Bacias Hidrográficas da ilha de Santiago, República de Cabo Verde (agora e adiante referido como "a Missão de Estudo"), despachado pela Agencia de Cooperação Internacional Japonesa (JICA), liderado por Shigeru Nakada, e a comissão de gestão liderado por Emitério Ramos, Director Geral da DGASP (Direcção Geral da Agricultura Silvicultura e Pecuária) Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos, organizaram uma discussão do Relatório de Evolução (3) do referido estudo em execução pela Missão de Estudo.

A lista dos participantes encontra-se em anexo.

1. Entrega do Relatório de Evolução (3)
   O Ministério do Ambiente e Agricultura, recebeu 20 cópias do Relatório de Evolução (3) entregue pela a Missão de Estudo no dia 22 de Fevereiro de 2009.

2. Reunião
   Um encontro para apresentação do Relatório de Evolução (3) foi realizado entre a Missão de Estudo e o comité na sala de conferência da Direcção-Geral da Agricultura, Silvicultura e Pecuária, no dia 25 de Fevereiro de 2010.

3. Apresentação
   A Missão de Estudo apresentou o Relatório de Evolução (3) baseados nos resultados obtidos no quarto estdo efectuada durante o período de Maio 2009 a Março de 2010.

4. Discussão
   Do discutido, a comissão de gestão e a Missão de Estudo acordaram nos conteúdos do Relatório de Evolução (3). Entretanto, os seguintes pontos foram discutidos:

(a) A parte Japonesa solicitou a parte Cabo-verdiana para dar continuidade aos projectos pilotos implementados durante os últimos dois anos, depois do estudo esteja terminado. A parte Cabo-verdiana prometeu dar continuidade com os recursos próprios.
(b) A parte Japonesa salientou que, este projecto vai ser elaborado e o draft final do relatório vai ser apresentado em Junho próximo com as recomendações adequadas. A parte Cabo-verdiana reconhece a continuidade deste projecto como ser do seu melhor interesse com base nas recomendações.
(c) A parte Cabo-verdiana solicitou a organização de uma reunião de disseminação em Junho para a divulgação dos importantes resultados obtido durante o estudo. A parte Japonesa respondeu que isso seria um assunto importante para ser considerada.

Em caso de qualquer confusão na interpretação, prevalece o texto em inglês.

LISTA DOS PARTICIPANTES

Data : 25 Fevereiro 2010
Lugar : Conferenc Room of General Director of Agriculture, Forestry and Livestock

Cape Verdien Side

	Name	Position
1	Emitério Ramos	DG, DGASP
2	Ângela Moreno	DGASP / DSER (Cood. of JICA / DGASP Projetct)
3	Eugenio de Barros	DGASP / DSER
4	Conceição Moreno	DGASP / DSS
5	Paulo Jorge C Barros	DMADRM
6	Dulce Borges	Jornalist / ETER
7	Augusto Andrade	Delegação do MADRRM no Praia / São Domingos
8	Daniel Xavier Da Luz	Delegação do MADRRM no Santa Cruz
9	Idana Furtado	Delegação do MADRRM no Santa Catarina
10	Humberto B. Lopes	OASIS Gestor

Japanese Side

	Embassy of Japan in Senegal	
11	Takao Aikawa	Second Secretary
	JICA Senegal Office	
12	Haruhiko Igawa	Assistant Representative
	JICA Study Team	
13	Shigeru Nakada	Chefe, Missão de Estudo da JICA
14	Massamba Gueye	Missão de Estudo da JICA
15	Masato Sako	Missão de Estudo da JICA
16	Antonio Fernandes	Intérpret

MINUTES OF MEETING ON THE PROGRESS REPORT (3)
FOR THE STUDY ON
THE INTEGRATED RURAL DEVELOPMENT IN WATERSHED
ON SANTIAGO ISLAND
IN THE REPUBLIC OF CAPE VERD

PRAIA, FEBRUARY 25, 2010

Mr. Emitério Ramos
General Director of Agriculture, Forestry and Livestock
Ministry of Environment, Rural Development and Marine Resources

Mr. Shigeru Nakada
Leader, JICA Study Team

Mr. Clarimundo Gonçalves
General Director of Planning, Budget and Management
Ministry of Environment, Rural Development and Marine Resources

The Study Team for the Study on the Integrated Rural Development in Watershed on Santiago Island in the Republic of Cape Verde (hereinafter referred to as "the Study Team") dispatched by Japan International Cooperation Agency (JICA), headed by Shigeru NAKADA as Team Leader, and the Steering Committee headed by Mr. Emitério Ramos, General Director of Agriculture, Forestry and Livestock, Ministry of Environment, Rural Development and Marine Resources, had a discussion on the Progress Report (3) for the Development Study submitted by the Study Team.

The list of participants is attached in Annex.

1. Submission of Progress Report (3)
The Ministry of Environment, Rural Development and Marine Resources received 20 copies of the Progress Report (3) submitted by the Study Team on the 22nd February 2010.

2. Meeting
A meeting on the Progress Report (3) was held between the Study Team and the Steering Committee at the Conference room of the General Directorate of Agriculture, Forestry and Livestock on the 25th of February 2010.

3. Presentation
The Study Team explained the Progress Report (2) formulated in compliance with the results of the forth field study conducted from May 2009 to March 2010.

4. Discussion
From the discussion, the Steering Committee and the Study Team confirmed their agreement on the contents of the Progress Report (3). Meanwhile, the followings are the matters confirmed by both parties.

(a) The Japanese side requested the Cape Verde side to continue the pilot projects which have been implemented for the past two years, after the completion of the Study. The Cape Verde side reiterated its commitment to continue them on their own.

(b) The Japanese side stated that this project will be elaborated and the draft final report will be presented in June with proper recommendations. The Cape Verde side said that it would be in its best interest to continue the projects based on the recommendations.

(c) The Cape Verde side requested that a dissemination seminar be held in June to spread the important results obtained from the Study. The Japanese side answered that it would be an important issue to be considered.

In case of any discrepancy of interpretation, the English text shall prevail.

LIST OF PARTICIPANTS

Data : 25 February 2010
Lugar : Conferenc Room of General Director of Agriculture, Forestry and Livestock

Cape Verdien Side

	Name	Position
1	Emitério Ramos	DG, DGASP
2	Ângela Moreno	DGASP / DSER (Cood. of JICA / DGASP Projetct)
3	Eugenio de Barros	DGASP / DSER
4	Conceição Moreno	DGASP / DSS
5	Paulo Jorge C Barros	DMADRM
6	Dulce Borges	Jornalist / ETER
7	Augusto Andrade	Delegação do MADRRM no Praia / São Domingos
8	Daniel Xavier Da Luz	Delegação do MADRRM no Santa Cruz
9	Idana Furtado	Delegação do MADRRM no Santa Catarina
10	Humberto B. Lopes	OASIS Gestor

Japanese Side

	Embassy of Japan in Senegal	
11	Takao Aikawa	Second Secretary
	JICA Senegal Office	
12	Haruhiko Igawa	Assistant Representative
	JICA Study Team	
13	Shigeru Nakada	Chefe, Missão de Estudo da JICA
14	Massamba Gueye	Missão de Estudo da JICA
15	Masato Sako	Missão de Estudo da JICA
16	Antonio Fernandes	Intérpret

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ACTA DA REUNIÃO PARA APRESENTAÇÃO DO DRAFT DO RELATÓRIO FINAL DO ESTUDO PARA O DESENVOLVIMENTO RURAL INTEGRADO DAS BACIAS HIDROGRÁFICAS DA ILHA DE SANTIAGO DA REPÚBLICA DE CABO VERDE

PRAIA, 24 de Setembro de 2010

Sr. João Baptista Freire de Andrade
Director Geral da Agricultura, Silvicultura e Pecuária
Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos

Sr. Shigeru Nakada
Chefe, Missão de Estudo
JICA

Sr. Clarimundo Gonçalves
Director Geral do Planeamento, Orçamento e Gestão
Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos

A Missão de Estudo para o "***Estudo do Desenvolvimento Rural Integrado das Bacias Hidrográficas da Ilha de Santiago, República de Cabo Verde***" (agora e adiante referido como "a Missão de Estudo"), despachado pela Agencia de Cooperação Internacional Japonesa (JICA), liderado por Shigeru Nakada, e a comissão de gestão liderado por Sr. João Baptista Freire de Andrade, Director Geral da DGASP (Direcção Geral da Agricultura Silvicultura e Pecuária) Ministério do Ambiente, Desenvolvimento Rural e dos Recursos Marinhos - MADRRM, organizaram uma discussão do Draft do Relatório Final do referido estudo em execução pela equipa técnica do JICA..

A lista dos participantes encontra-se em anexo.

1. Entrega do Draft do Relatório Final

   O Ministério do Ambiente, do Desenvolvimento Rural e dos Recursos Marinhos, recebeu 30 cópias do Draft do Relatório Final (Versão Português) e 5 cópias (Versão Inglês) entregue pela a Missão de Estudo no dia 21 de Setembro de 2009. Além disso, o Ministério recebeu 50 cópias de cada manual, ou seja, " Manual de Extensão Rural ", " Manual de Economia de Água na rega " e " Manual de Produto Agrícola Processamento ".

2. Reunião

   Um encontro para apresentação do Draft do Relatório Final foi realizado entre a Missão de Estudo e o comité na sala de reunião da Direcção-Geral da Agricultura, Silvicultura e Pecuária, no dia 24 de Setembro de 2010.

3. Apresentação

   A Missão de Estudo apresentou o Draft do Relatório Final que contém as atividades e os resultados de todo o Estudo do Desenvolvimento Rural Integrado das Bacias Hidrográficas da ilha de Santiago.

4. Discussão

   Da discussão do documento Final, o comité de pilotagem e a Missão de Estudo (equipa Técnica de JICA) acordaram nos conteúdos do Draft do Relatório Final. Entretanto, os seguintes pontos foram debatidos:

(a) O Comité mencionou que o processamento de produtos agrícolas é muito importante para Cabo Verde, pois há muitas perdas de produção agrícola no país na época de alta produção. O Comité de Pilotagem ainda concordou que a transformação/processamento de produtos agrícolas poderia ter melhores resultados, se Cabo Verde tivesse mais experiência nessa matéria, mais peritos e serviços de extensão rural adequado a esse nivel. Assim, o Comité propõe sugerir MADRRM que estabeleça cooperação de formação com JICA ou com outras organizações internacionais para estágios de cabo-verdianos na área de transformacao/processamento para melhor aproveitamento de produtos agrícolas pós colheita.

(b) O Comité de Pilotagem sugeriu que o aproveitamento de recursos hídricos é muito importante para Cabo Verde, dado a falta de água para irrigação que impera. No entanto, os projectos-piloto sobre o aproveitamento de recursos hídricos não obtiveram ainda resultados conclusivos, uma vez que não se encontrou, no mercado, na altura devida, unidades de rega necessárias para serem instalados a fim de ser usado as águas armazenadas. Apesar disso, neste momento já há algumas famílias agrícolas aproveitando a água armazenada. E há perspectiva da DGASP apoiar os familiares na continuação de instalação de gota-a-gota e uso eficiente dessas águas armazenadas em reservatórios. Daí que deve ficar claro, que o sistema de colecta de água é de grande importância para cabo Verde, agora e nos projectos futuros para desenvolvimento do Sector agrícola.

(c) O Comité de Pilotagem afirmou que um projecto considerado de baixa prioridade na Bacia Hidrográfica de São Domingos, não é algo a ser generalizado para todas as bacias hidrográficas de Santiago, pois cada bacia apresenta a sua particularidade e potencialidades próprias. Dai que o Comité de Pilotagem propôs ao MADRRM especial cuidado na questão de priorização quando for elaborar o plano de acção em outras bacias hidrográficas.

(d) O Comité de Pilotagem declarou que os programas apresentados no Plano de Acção foram bons assim como possíveis de serem realizados. A DGASP expressou a sua forte intenção de estender e aplicar este plano de acção em outras bacias hidrográficas da ilha de Santiago. O Comité de Pilotagem propôs sugerir ao MADRRM, cooperações com JICA ou de outras Organizações Internacionais, no momento de planificação de outras Bacias hidrográficas de Santiago.

5. Equipamento a ser Entregue

   A parte Cabo-verdiana concordou em ser responsável e cuidadosa no manuseio dos equipamentos do projeto a ser entregue oficialmente pelo JICA, e tomar medidas para usá-los corretamente para a execução dos Projectos Alvos do Plano de Acção nas futuras bacias hidrográficas.

6. Comentários Adicionais

   Os comentários adicionais sobre o Draft do Relatório Final deve ser feito, se necessário, pela parte cabo-verdiana durante o Seminário/workshop a ser realizado no dia 27 de Setembro de 2010, altura em que a equipe irá considerar as observações sobre a finalização do Relatório Final.

Em caso de qualquer confusão na interpretação, prevalece o texto em inglês.

LISTA DOS PARTICIPANTES

Data : 24 Setembro 2010
Lugar : Sala de Reunião da Direcção Geral de Agricultura Silvicultura e Pecuária

Parte Cabo-verdiana

	Name	Instituição
1	João Baptista F de Andrade	DG, DGASP
2	Clarimundo Gonçalves	DG, DGPOG
3	Ângela Moreno	DGASP / DSER (Cood. of JICA / DGASP Projetct)
4	Edesio Cardoso	OASIS
5	Celestino Tavares	DGASP / DSER
6	Anita Carvalho	DGASP / DSER /DSS
7	Daniel Xavier Luz	DADRRM – Delegação de Santa Cruz
8	Rizulena Monteiro	Jornalist / ETER
9	Dulce Borges	Jornalist / ETER
10	Manuel Brito	Jornalist / ETER
11	Eveline Ramos	Delegação do MADRRM Tarrafal/São Miguel
12	Gracelino Semedo	Delegação do MADRRM no Santa Catarina
13	Emídio Sanches	Câmara Municipal de Santa Cruz
14	Fernando Monteiro carvalho	Câmara Municipal de São Salvador do Mundo
15	Aniceto Tavares	Câmara Municipal de São Domingos
16	Eneida Rodrigues	DGASP/DSAP
17	Carla Tavares	DGASP/Directora DSAP
18	Mina Teixeira	DGASP/DSAP
19	Regla Hernádez	INIDA
20	Maria de Lurdes Lima	INGRH
21	Alcina Monteiro	DGA
Japanese Side		
	JICA Senegal Office	
22	Haruhiko Igawa	Assistant Representative
	JICA Study Team	
23	Shigeru Nakada	Chefe, Missão de Estudo da JICA
24	Masato Sako	Missão de Estudo da JICA
25	Alfred Moreno	Intérpret

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MINUTES OF MEETING ON THE DRAFT FINAL REPORT
FOR THE STUDY ON
THE INTEGRATED RURAL DEVELOPMENT IN WATERSHED
ON SANTIAGO ISLAND
IN THE REPUBLIC OF CAPE VERD

PRAIA, SEPTEMBER 24, 2010

Mr. João Baptista Freire de Andrade
General Director of Agriculture, Forestry and Livestock
Ministry of Environment, Rural Development and Marine Resources

Mr. Shigeru Nakada
Leader, JICA Study Team

Mr. Clarimundo Gonçalves
General Director of Planning, Budget and Management
Ministry of Environment, Rural Development and Marine Resources

The Study Team for the Study on the Integrated Rural Development in Watershed on Santiago Island in the Republic of Cape Verde (hereinafter referred to as "the Study Team") dispatched by Japan International Cooperation Agency (JICA), headed by Shigeru NAKADA as Team Leader, and the Steering Committee headed by Mr. João Baptista Freire de Andrade, General Director of Agriculture, Forestry and Livestock, Ministry of Environment, Rural Development and Marine Resources, had a discussion on the Draft Final Report for the Development Study submitted by the Study Team.

The list of participants is attached in Annex.

1. Submission of Draft Final Report

The Ministry of Environment, Rural Development and Marine Resources received 30 copies of the Draft Final Report (Portuguese Version) and 5 copies (English Version) submitted by the Study Team on the 21st September 2010. Additionally, the Ministry also received 50 copies of each Manual, namely "Rural Extension Manual", "Water Saving Irrigation Manual" and "Agricultural Produce Processing Manual".

2. Meeting

A meeting on the Draft Final Report was held between the Study Team and the Steering Committee at the Conference room of the General Directorate of Agriculture, Forestry and Livestock on the 24th of September 2010.

3. Presentation

The Study Team explained the Draft Final Report that contains the activities and the results of the whole Study on the Integrated Rural Development in Watershed on Santiago Island.

4. Discussion

From the discussion, the Steering Committee and the Study Team confirmed their agreement on the contents of the Draft Final Report. Meanwhile, the followings are the matters confirmed by both parties.

(a) The Committee mentions that the agricultural produce processing is very important, as there are many losses of the agricultural produce at the season in Cape Verde. The Steering Committee agrees that the Agricultural Produce Processing could get better results, if the Cape Verde had more experience, more experts and proper rural extension services in this field. Therefore, the Committee will suggest MADRRM to make requests to JICA or the International Organizations to accept trainees from Cape Verde for the agricultural produce processing.

(b) The Steering Committee suggests that the water resources development is very important for Cape Verde due to lack of irrigation water. However, the Pilot Projects concerning the utilization of water resources did not get conclusive results yet, as the units of irrigation system to be installed for the good use of the stored water were in shortage at the market. Even though, currently, there are already some farmers taking advantage of the stored water, DGASP will see the support to the farmers for installing the drip irrigation systems and efficient use of the water stored in the reservoirs. The Committee also states that the water collecting system is very important for Cape Verde at present and in the future for the agricultural sector development.

(c) The Steering Committee states that the priorities placed on the action programs in this Study could be variable depending on the conditions of other watersheds in Santiago Island. Consequently, the Committee proposes that MADRRM shall take special care on the prioritization when he will draw up the action plan in other watersheds.

(d) The Steering Committee states that the action programs presented in the Action Plan are very realizable and expressed his strong intension to extend and implement them to and in other watersheds in Santiago Island. For the implementation of the Plan, the Committee suggests MADRRM to seek possibilities to get assistance from JICA or the International Organizations.

5. Equipment to be Handed Over

The Cape Verde side agreed to be responsible and careful in handling the project equipment to be handed over from JICA, and take measures to properly use them for implementing the Action Programs of the Action Plan.

6. Additional Comments

The additional comments on the Draft Final Report shall be made, if necessary, by the Cape Verde side at the time of the Seminar to be held on the 27th September 2010, and the Team will consider the comments on finalizing the Final Report.

In case of any discrepancy of interpretation, the English text shall prevail.

LIST OF PARTICIPANTS

Data : 24 September 2010
Lugar : Conferenc Room of General Director of Agriculture, Forestry and Livestock

Cape Verdien Side

	Name	Instituição
1	João Baptista F de Andrade	DG, DGASP
2	Clarimundo Gonçalves	DG, DGPOG
3	Ângela Moreno	DGASP / DSER (Cood. of JICA / DGASP Projetct)
4	Edesio Cardoso	OASIS
5	Celestino Tavares	DGASP / DSER
6	Anita Carvalho	DGASP / DSER /DSS
7	Daniel Xavier Luz	DADRRM – Delegação de Santa Cruz
8	Rizulena Monteiro	Jornalist / ETER
9	Dulce Borges	Jornalist / ETER
10	Manuel Brito	Jornalist / ETER
11	Eveline Ramos	Delegação do MADRRM Tarrafal/São Miguel
12	Gracelino Semedo	Delegação do MADRRM no Santa Catarina
13	Emídio Sanches	Câmara Municipal de Santa Cruz
14	Fernando Monteiro carvalho	Câmara Municipal de São Salvador do Mundo
15	Aniceto Tavares	Câmara Municipal de São Domingos
16	Eneida Rodrigues	DGASP/DSAP
17	Carla Tavares	DGASP/Directora DSAP
18	Mina Teixeira	DGASP/DSAP
19	Regla Hernádez	INIDA
20	Maria de Lurdes Lima	INGRH
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	JICA Study Team	
23	Shigeru Nakada	Chefe, Missão de Estudo da JICA
24	Masato Sako	Missão de Estudo da JICA
25	Alfred Moreno	Intérpret