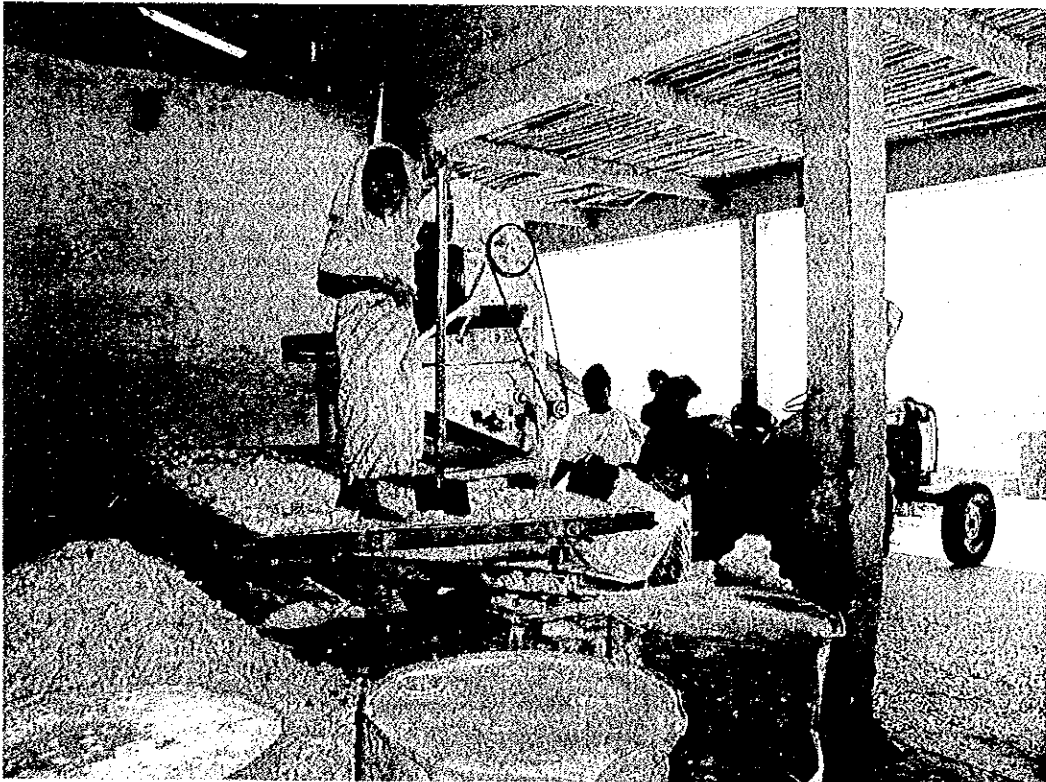


**CHAPTER VI.  
FORMULATION OF AGRICULTURAL  
DEVELOPMENT PLAN**



## CHAPTER VI. FORMULATION OF AGRICULTURAL DEVELOPMENT PLAN

### 6.1 Key Targets of Agricultural Development Plan

The agricultural development plan for the target year 2007 as mid-term as well as the year of 2017 as long-term shall be prepared based on the availability of central government investment capacities and requirement of national level food securities. In the previous Chapter IV, nation wide economy, especially availability of revenue source and possibility of investment for agricultural sector are analyzed. Those investments including capital investment and some subsidization funds for agriculture will be expected approximately ten percent of national annual budgets (national combined revenues).

Sustainable performance of food security, on the other hand, will be realized depending upon strong efforts by the government and private sectors including farmers concerned for the time being. Production of agricultural products, especially staple crops, i.e., paddy rice, maize and cassava is key important role for realization of the targets. According to the past experiences and diet custom, peoples in nationwide intake rice and maize as main food. As discussed previous chapter, increased production of such staple crops aims much contribution to keep sustainable food security, and to reduce import rice from foreign countries. Special remarks are urgent implementation of irrigation systems rehabilitation, provision of farm road networks and improvement of post-harvest systems, improvement of cropping technology, improvement of marketing systems, etc..

From the viewpoints of environmental preservation of watershed, community base forest development (so called greening in the private forest) shall be promoted in nationwide level, especially northern part of the country with less rainfall regions. These schemes will greatly contribute to produce inter crops, fruits and tree crops, fuel woods and to provide grazing land, with keeping and/or improving environmental conditions in the Study Area.

Integrated agricultural development plan, therefore, are prepared based on the above key roles and the following targets which identified food balance between supply and demand and development scenarios.

As a special issues for realization of development scenarios and stable food supply during mid-term development period, government should establish relevant laws and regulations concerning subsidization level of infrastructure development, material supply, consolidation of post-harvest facilities and extension services as well as institutional developments for respective sectors in the Ministry of Agriculture and Fisheries (MAF) and regional level.

Integrated agricultural development plan, i.e., agriculture productions, livestock raising, forestry development and fishery development including capacity building of the farmers and fishermen, are discussed in the following sections in details.

### Major Targets of Production and Infrastructure Development

| Sector  | Description and Countermeasures/<br>Improvements   | 2007<br>(Mid-Term)      | 2017<br>(Long-Term)       |
|---|--|-------------------------|---------------------------|
| <b>A. Production</b>                            |  |                         |                           |
| <b>A.1 Agriculture</b>                          |  | (ton)                   | (ton)                     |
| Paddy rice                                      | Seed supply, post-harvest facilities, rat control, marketing system, chemical application,       | 88,900                  | 118,700                   |
| Maize   |  | 105,600                 | 131,800                   |
| Cassava   |  | 42,600                  | 53,200                    |
| Coffee  |  | 11,000                  | n.a.                      |
| Tree crops                                      |  | non                     | n.a.                      |
| Other crops                                     |  | n.a.                    | n.a.                      |
| <b>A.2 Livestock</b>                            | Provision of young female cattle, strengthening veterinary services and grazing land development | 80 % of 1998 level      | 120 % of 1998 level       |
| <b>A.3 Forestry</b>                             |  |                         |                           |
| Reforestation                                   | Strong government support, motivation of community people, marketing of Candle-nut oil           | 2,700 ha                | 8,000 ha                  |
| Regreening                                      |  | 14,200 ha               | 42,600 ha                 |
| Fuel wood                                       |  | 1,500,000m <sup>3</sup> | 1,800,000m <sup>3</sup>   |
| Candle-nuts                                     |  | 1,300 ha                | 3,900 ha                  |
| <b>A.4 Fishery</b>                              | Open boat-building   | +300 vessels            | n.a.                      |
|   | Fishing gears improvement  | n.a.                    | n.a.                      |
|   | Fish landing statistics  | 22 to 33 sites          | n.a.                      |
|   | Small-scale enterprises for fishery  | +22 firms               | n.a.                      |
|   | CBFM baseline survey   | 40 sites                | n.a.                      |
| <b>B. Infrastructures Condition</b>             |  |                         |                           |
| <b>B.1 Canal Rehabilitation</b>                 | Strong government support, Strengthening civil engineer technology                               | Functional<br>20,500 ha | Functional<br>33,000 ha   |
| <b>B.2 Storage Reservoir, Weir Construction</b> | Ditto  | Non                     | Dam :9Nos<br>Weir :10 Nos |
| <b>B.3 Farm Road Expansion</b>                  | Ditto  | Totally<br>110 km       | Totally<br>330 km         |

## 6.2 Agricultural Development Plan

### 6.2.1 Agricultural Production Plan

The basis of an agricultural production plan begins with quality seeds of the major crops and vegetables in adequate supply and of known purity. There is no source of quality seed in East Timor at present and this is a first priority. Following after seed supply for the major crops, a supply of seed for vegetables needs to be developed. However, quality-imported seed can largely meet this need and imported seed can be tested for production in known localities prior to introduction.

## 1) Seed Production

### a) Rice Seed Production

At present (March 2002), the ACIAR program of seed multiplication is working with the MAF and local and International NGOs to produce certified IR 64 seed on contract farmer's fields. They are importing one ton of IR-64 rice seed from IRRI in the Philippines to be multiplied and distributed in East Timor. They do not have funds to establish a seed farm and the present rice seed project is funded by USAID. This program is a good training exercise for local farmers but it needs to be supported institutionally in the future and not just as a one off project.

With two or three tons of foundation seed, a farmers group could easily produce 200 tons of certified seed in one season. With this amount of certified seed produced, it would be possible, in four or five years, to provide rice farmers in East Timor with a rice variety of known purity

East Timor needs a relatively modest amount of certified seed each year. The total amount of rice seed used each year is about 800 tons (20,000 ha paddy rice x 40 kg/ha seed). The MAF needs to set up a small seed farm of 10 to 15 ha for producing foundation rice seed that can be distributed for further multiplication to farmer cooperators – some of whom are already participants in the ACIAR/USAID seed multiplication project. In cooperation with UN agencies during the period following September 1999, local and international NGOs have been very successful in obtaining the cooperation of farmer groups in producing good quality seed. The Don Bosco High School in Fatumaca, Baucau could also provide this multiplication.

This small seed station could also serve as variety testing station and for initial multiplication of new varieties of more recently released varieties. Newly released varieties are usually only available in about one kilogram samples from the International Research Centers which needs to be increased under very closely supervised conditions and not on farmers fields.

Rice seed of the variety IR-64 (110 days maturity) was introduced in Indonesian times and has performed well in most locations. IR-64 is probably the most widely grown rice variety in Indonesia, the Philippines and Vietnam. Since this seed is also well known to the better farmers, it should be introduced first in any seed multiplication system. Two other varieties should also be considered; one with a longer maturity and one with a shorter maturity. This should satisfy the immediate seed needs in terms of varieties until 2007.

### b) Corn Seed Production

Since corn is generally grown with no fertilizer or land preparation using the traditional slash and burn system and usually intercropped with beans, squash and/or cassava in the same fields, the need for certified seed are not so critical as with rice. However, about 20

percent of the corn crop is grown with appropriate mechanized land preparation and with farmers willing to use fertilizer. These farmers would be better off using certified seed from fertilizer responsive varieties from Indonesia, Thailand or the Philippines.

As part of a general variety improvement program it would also be useful to set up a similar seed multiplication station in the uplands where new corn varieties could be tested and multiplied. Although corn alone would probably not be worth investing in a small station the addition of other upland crops would make it a useful addition to the MAF.

c) *Bean, Cassava and Sweet Potato and Vegetable Seed Production*

At the same small upland station where corn is tested and multiplied, introduced varieties of other upland crops could also be tested and multiplied. These crops would be for further multiplied by contract growers in the appropriate ecological zones. These small seed multiplication stations should maintain some contact with the International Agriculture Institutes to keep a steady supply of new and improved germplasm coming into the country

The ACIAR funded project (Seeds of Hope) has started wide scale screening of the above species in different agro-ecological zones of the country but this needs to be institutionalized and enlarged to take care of future seed needs

d) *Small Seed Production Station*

The specific characteristics of this proposed station would best be discussed at length with the MAF. Preliminary discussions with them have indicated that they would prefer to rehabilitate the Indonesian built seed station in Betano in Manufahi on the southern coastal area because of the ability to provide irrigation water all year round. The buildings at this station have been destroyed but present members of the MAF (Crops Division) have worked there in the past and they consider it the most promising location

2) *Crop Production Plan*

a) *Fertilizer Inputs*

It is essential for increasing crop yields that some way of getting fertilizer to the rural areas via PASC centers or some form of rural credit. At present fertilizers are available in Dili at reasonable prices (urea at US\$ 230/ton; SP-36 at US\$ 270/ton and KCl at US\$ 470/ton) but almost unobtainable in the rural areas. Increased fertilizer use will have to be promoted with as much staff as possible with corresponding group credit arrangements

b) *Agricultural Staff in the Crops Division of MAF*

The present agricultural staff is competent in terms of background and competent in terms of performance to do all the training and demonstration necessary to carry out simple

trials and demonstrations of fertilizer use and new variety trials. Their training and technical background is more than adequate but they are working in an economic environment very unfavorable to expect most farmers to rapidly adopt new technologies. Economic analysis depends on stability and predictability of pricing which is not present. As in everything else the problems of farm gate price and marketing channels will control the success of their efforts.

c) Transportation for District Agriculture Staff

The present lack of motorcycles for district agriculture extension staff is seriously retarding all rural development. These extension staffs in the districts are not able to get to the field to assist farmers. It makes very little sense for having district agriculture extension staff if they are kept immobile. It is also useful to note that the Cooperative Café Timor has over twenty motorcycles just for the use of their extension staff. This is more than the government has provided all the districts. Transportation and travel money for expenses are absolutely essential if any progress is to be obtained.

d) Fertility Demonstrations and Trials

Simple eight plot fertility demonstrations trials of the FAO type need to be set up for all the major rice growing areas. Most of the fertility recommendations made in East Timor previously were not based on actual field trials. This should be an essential activity for the district extension staff. It is likely that the farmers on high pH calcareous rice soils are getting a poor fertility response with urea and SP-36 because of lack of potassium. Unfortunately the KCl fertilizer is the most expensive and thus last to be purchased.

Zinc Oxide treatments are also a useful addition to the general FAO type fertility demonstration trial. On the high pH soils that are so typical of major rice growing areas the addition of zinc treatments can greatly increase yields at a very low price

3) Plantation

The large coffee industry falls under forestry now, so it is not a part of the crop production division and plantation crops like coconut are again dependent on trading linkages. The coconut industry is stagnant and the profitability of this sector and the long-term viability of it depends more on the private sector than on government interventions.

4) Inputs and Material Supply with Subsidization

For the slash and burn corn farmers of the uplands, the major item needed is 220 liter drums for crop storage. Since these farmers do not have a large surplus of corn at the end of the year, it is difficult for them to market their crop. Seeds of new varieties should also be introduced to these farmers so that they can test them under their own conditions. Smaller storage containers would also be useful for protecting bean crops from post-harvest insects.

## 5) Improvement of Farming Practices

Upland farmers need to have the importance of increasing their bean production explained to them to increase the protein supply in their diet. They also need to get the message that inter-cropping other bean crops with corn is a good practice and also the importance of squash leaves and flowers as a vegetable in their diet.

For the lowland rice crops, any increase in the mechanization of land preparation would be useful.

## 6) Agriculture Extension Services

As mentioned above the need for demonstrations of fertility response is necessary but there is also a need for constant training and upgrading of skills base for district agricultural extension officer. For those who have the language capacity training at some of the International Agriculture Centers would be useful as would training at foreign universities.

### 6.2.2 Consolidation Plan of Agricultural Infrastructures

#### 1) Rehabilitation of Irrigation Facilities

##### a) Basic Concept

The basic concept of the rehabilitation plan is to rehabilitate the existing facilities. Therefore, the location of intake facilities and canals will not be basically changed. In terms of permanent facilities, damaged facilities will be improved, and the existing facilities will be used during the construction period as much as possible.

##### b) Objectives and Scope of the Rehabilitation Plan

The objectives of the rehabilitation plan include reconstruction and providing stable intake-water by improving the weir facilities and recovering water flow by improving the irrigation canal. Realization of these objectives aims to increase the rice yield, job opportunity to the farmers and to grade up living standards of farmers.

The scope of the rehabilitation plan of irrigation facilities includes the improvement of intake facilities and main canals as its main objectives. Those of secondary canals, tertiary canals and those related structures are not included because they are managed by farmer's groups.

##### c) Rehabilitation Plan

As indicated in Table I-2, there are 57 existing irrigation schemes (approximately larger than 100ha potential irrigation area). Among those irrigation schemes, 17 schemes are

categorized as seriously damaged one, 22 schemes are categorized as light to medium damaged one and 18 schemes are categorized as unaffected one. One seriously damaged scheme (Laclo in Manatuto district, 660ha of total irrigation area) is going to be implemented till the end of the year 2002 under UNOPS, and four light-medium damaged schemes (Baedubu and Uaibati in Viqueque district, Bilimau and Halicao in Bobonaro district, 805ha in total damaged area) are currently implemented under World Bank.

Moreover, according to the Irrigation Division's plan in MAF, another seven light-medium schemes (Seisal-down in Baucau district, Marco, Cailaco/Meligo, Batugade in Bobonaro district and Tono, Oemathitu, Naktuka in Oecussi district, 658ha in total damaged area) are going to be implemented till the end of the year 2002 under TFET budget.

Among the remaining schemes, eleven light-medium schemes (990 ha) and 16 seriously damaged schemes (16,201 ha) should be rehabilitated by MAF in this mid/long-term plan (17,191 ha in total) from 2003 to 2017 (see Table I-9).

#### d) Priorities of the Rehabilitation

The priorities for urgency of rehabilitation can be classified by assessing the damage of the facilities and influences on agriculture (sleeping area).

The top priority will put on the light to medium damaged schemes whose part of irrigation area is sleeping area because full water diversion can not be taken due to partial destroyed irrigation facilities. After the completion of rehabilitation works for the light to medium damaged scheme, the seriously damaged schemes will be implemented.

### 2) New Water Resources Development (Storage Reservoirs and Weirs)

#### a) Basic Concept

The basic concept of the new water resources development plan is to construct the dams or reservoir and also weirs.

#### b) Objectives and Scope of the Plan

The objectives of the new water resources development plan is to provide the stable water supply to the existing irrigation schemes as well as the new irrigation schemes with the high cropping intensity more than 116 of present one, and if possible the flood protection. The realization of these objectives aims to increase the rice yield, job opportunity to the farmers and to grade up the living standards of farmers.

The scope of the new water resources plan includes the construction of new dams or reservoirs and also weirs.



### c) Water Resource Development Plan

While the major rivers may flow throughout the year, flows during the low rainfall months are usually too low for diversion from weirs, so there is need for reservoirs in the upper reaches to store water for use the drier months in order to attain more high crop intensity.

During the Indonesian administration, DPU has identified possible locations for dams or reservoirs on nine of permanent rivers in the southern coastal area from an analysis of topographical maps at a scale of 1:25,000 and geological maps at a scale of 1:270,000. The prospective reservoir or dam sites are shown in Figure I-4 and the dimensions of each dam are shown in Table I-10. The dam or reservoir sites are far from the irrigation area, so there is need for weirs in the lower reaches to take the irrigation water. The prospective weir sites are shown in Figure I-4 and the some information are shown in Table I-11.

However, due to the severe financial situation of East Timor, the costs to construct the dams and reservoirs are not included in the estimated costs of this plan,

### 3) Farm Road Development Plan

#### a) Basic Concept

Farm roads are vital element to ensure accessibility between farmland and village/village roads (farm-to-market roads) not only for the agricultural development but also for upgrading the living standard in the rural area. The basic concept of farm roads transportation plan shall be to provide accessibility to with all farmland area with all-weather road at least gravel surface.

The most essential function of farm roads to be considered in the farmland areas is one of portion as the farm-to-market road, which is particularly utilized for transportation and distribution of agricultural products and inputs such as fertilizers and farming materials. Direct effects/merits of farm road development are the savings of transportation costs and time, decreasing the heavy work by manpower on farmland such as transportation of the products from harvesting point to farm-to-market road.

Farm road is required to connect farmland and village/farm-to-market road, and obviously necessary to support the irrigation and agricultural development plans. Therefore, infrastructure development plan shall include the adequate supply of farm roads to the farming areas in parallel with proposed agriculture development plans.

The farm road development plan is the improvement of the traffic network from the farmland to the village and/or to the village road (farm-to-market road). The traffic network comprises the arterial (national roads and district roads), the local roads (district roads) and village roads (farm-to-market road). Among these roads, the arterial and local roads are planned by Department of Infrastructure, and the farm-to-market roads are being improved by

MAF. Therefore, just the farm road is considered on this development plan.

b) Objectives

There are few farm roads in this Study Area. Even if there are any farm roads, the present condition of parts of the roads becoming impassable during the rainy season is giving the farmers unfavorable transporting environment. Farm roads are used not only for the transportation of agricultural inputs or outputs but also contribute to the improvement of the living conditions of the rural peoples. In addition to the primary purpose of smooth transportation of agricultural products into and out of fields, the roads construction shall have meaning of improvement of the social infrastructure, which is necessary for the daily life of the farmers and local residents.

c) Farm Road Development Plan

(1) Width of Farm Road

The widths of the vehicles expected to pass the road, the width of vehicles passing each other, the passable width and the road shoulders are added together to fix the road width. The final dimensions are as follows.

Width of Farm Road

| Required Items               | Required Width (m) |
|------------------------------|--------------------|
| Large truck (payload 5 tons) | 2.4                |
| Passing tolerance            | 0.0 i/             |
| Outside tolerance            | 0.6                |
| Sub- Total                   | 3.0                |
| Shoulders                    | 1.0                |
| Grand-Total                  | 4.0                |

Remarks; i/: as one traffic lane

The vehicle and farmers should be able to pass without being bumped. The people at the time of the passing of the vehicle shall move to the road shoulder. Thus, the space (width) for the working people shall not be allocated. The waiting place for vehicle (width 3.0 m, length 10.0m) shall be constructed at about 1.0 km intervals.

(2) Road Density

To improve the transportation of the farm inputs and outputs, the road density of production roads shall be increased. The road density is calculated by the following equation:

$$\text{Road density} = \frac{\text{Planned roads}}{\text{agricultural land area}}$$

$$\text{Average road density} = \frac{\text{one production road through the middle of one square kilometer agricultural land}}{\text{agricultural land}}$$

$$\text{Agricultural land ; } 1,000 \text{ m} \times 1,000 \text{ m} = 100 \text{ ha}$$

Production road ; 1 km

Thus, the road density =  $1,000 \text{ m} / 100\text{ha} = 10 \text{ (m/ha)}$

Therefore, with the road density of 10 m/ha, it becomes possible to carry out agricultural products to the farm-to-market road with less than 500 m of transportation by manpower.

### (3) Typical Section and Road Surface

The effective road width shall be a gravel road. The dimension of typical section is as follow;

- Thickness of gravel surface : 20 cm
- Effective width : 3.0 m
- Cross grade : 3 %

### (4) Proposed Length of Farm Road

The proposed length of farm road is summarized shown below. An objective rehabilitation area for irrigation schemes is 33,000 as potential irrigation area of paddy land (see Table I-2).

- Objective rehabilitation area : 33,000 ha
- Road density : 10 m/ha
- Total length of construction : 330 km

## 6.2.3 Establishment of Farm Machinery Training and Hiring Stations

### 1) Project Objectives

After the crisis in September, 1999, farm machinery have been urgently introduced into East Timor by skipping over the experience of animal drawn equipment to alleviate the shortage of farming labor while increasing agricultural production. However, the effective utilization of these farm machineries for increasing agricultural production from the increase of the labor efficiency is not yet established despite the effort by the related agencies due to shortage of skilful operators, proper technology of repair and maintenance, and lack of workshop tools. Farm mechanization in East Timor will be promoted by hiring system to moderate the heavy burden of initial investment and maintenance cost both to subsistence and surplus farmers in the mid and long-term process:

- Verification and evaluation on mechanized rice farming  
First, farm mechanization will be concentrated on rice farming which is required with top priority in order to establish small and mid-scale rice farmers in East Timor. Integrated rice farm mechanization is consolidated through the process of i.) preparation

of experimental, training and demonstration field, ii) verifying economic study on mechanized rice farming, iii) verifying experiment on possibility of rice mechanization, and iv) establishment of the mechanized rice farming system, which is executed under foreign technical cooperation program including overseas training of East Timorese counterpart personnel. Also upland farm mechanization will be developed including particular machines applicable for the slope land and maize storage method.

- Hiring services  
Hiring or contract services of farm machinery for land preparation, threshing and milling are to be started immediately to those farmers trained on operation. Transplanting, weeding and harvesting machine will be introduced when verification and evaluation will be completed.
- Training for operation and maintenance of farm machinery  
Training is continued to increase front line extension officers and farmers operators together with mechanics.

## 2) Project Components

For the purpose of introducing the mechanized rice farming system, in order to increase rice production and improve agricultural labor shortage on the basis of self-reliant sustainability and East Timor food security plan, following components are provided;

- Establishment and strengthening of farmer's organization and manpower
- Preparation of the field for experiment, training and demonstration with pumps for irrigation and drainage
- Building mainly consisting of laboratory, lecture room, auditorium, lodging, guest house, garage, warehouse and facility required for experiment, training, hiring, workshop and overall administration
- Farm machinery and equipment for experiment, training and hiring. Rice mill plant is provided to assist the establishment of marketing channel from farmyard to consumers together with transportation facility.
- Consolidation of repair and maintenance tools including mobile workshops like as fire car for on-the-field repair even in the remote area without any transportation vehicle.
- Training support tools including audio-visual aids
- Farm inputs such as seeds, fertilizers and chemicals for initial run

## 3) Project Goals

### Mid-term period (2003-2007)

- Mechanization rate of rice land preparation, threshing and milling works: 35 percent
- Reduction of post-harvest loss four percent or 3,696 ton paddy (92,400 ton x 4%) and 10 percent or 11,370 ton of maize production (113,700 ton x 10%)

### Long-term period (2017)

- Mechanization rate of rice land preparation, threshing and milling works: 75 percent
- Reduction of post-harvest loss: seven percent or 6,944 ton (paddy 99,200 x 7%) and 18 percent or 25,560 ton of maize production (142,000 ton x 18%)

#### 4) Project Site

Following three sites are proposed as farm machinery training and hiring station considering the center of rice granary in East Timor, that is, Mariana in Mariana district, Dili in Dili district and Viqueque in Viqueque district. This plan does not have concurrent on operation of Pilot Agricultural Service Center (PASC) proposed by World Bank, of which major features are summarized below.

In this plan, PASC project is evaluated as service stations of this plan in relation to the agricultural machinery training and hiring station. PASC will be expected to contribute crop production increase for both group and non-group members of the stations though continuous training on farm machineries such as tractor, post-harvest facilities, etc, and on maintenance of these agricultural machineries.

#### Pilot Agricultural Service Center (PASC)

PASC projects have been established as the pilot project under the World Bank programme of Agricultural Rehabilitation Project (ARP-II). Its basic policy is to introduce commercial base machinery operation with cost-sharing basis and to increase the agricultural production by effective utilization of them. Member of the PASC has to pay membership-fee of an amount of US\$100 to the group organization. Major features of the PASC are shown below;

|                       |  |
|-----------------------|--|
| Implementation Period | : September 2001 -- December 2003  |
| Project Sites         | : Bobonaro, Lautem, Covalima, Dili, Liquica, Manufahi  |
| Project Components    | : Cooperative operation of farm machineries<br>Repair and maintenance of machineries<br>Marketing of farm inputs (seeds, fertilizer, pesticide, etc) and farm machineries<br>Processing of agricultural processing and its marketing<br>Micro-finance services |

#### 6.2.4 Micro Finance Plan

Given the long experience in government subsidies under the Indonesian Government, it will take sometime to change the orientation of East Timor farmers about credit. Much more effort and time would be necessary if micro finance program is introduced. In this regard, the micro finance program to be implemented in the pilot project should consider the following.

- The program must be provided on a limited scale and only on the necessary production inputs, which need cash. These could be fertilizers; insecticides and other production inputs.

- It must make use of farmers' organizations if they exist or organize them in places where there are no existing organizations. The micro finance program must form part of the programs of the farmers' organization.
- The program must also provide capability development programs for leaders of farmers' organizations who will manage and operate the micro finance program. It must also provide a comprehensive orientation program to the beneficiaries of the micro finance program to enable them appreciate and recognize their roles and responsibilities in the micro finance program.
- The program should require counterpart from the beneficiaries. Such could include the contribution of labor and materials in kind required in agricultural production. Furthermore, the program should also encourage the formulation and implementation of policies and guidelines in the implementation of the micro finance program where burdens, efforts and benefits are fairly and equitably not only among leaders of the farmers but in all levels of their organization.
- The program should also include studies on the appropriate government policies and generate guidelines that shall be supportive of any micro finance program.

#### **6.2.5 Marketing Plan**

The government-supported marketing system developed during the Indonesians period is gone. A new market system has to be developed and in regard, the marketing program to be implemented in the Mir-Term Integrated Agricultural Development Plan should consider the following;

- The marketing program must be tied up with any credit or micro finance program.
- It must not only involved buying produce from the farmers but may also include selling to the farmers agricultural inputs such as fertilizers, insecticides and other production inputs were cash is needed.
- Also it must make use of farmers' organizations and marketing must form part of their existing programs.
- Similar to the micro finance program, this component must also study appropriate government policies and generate guidelines that shall be supportive of a program for the marketing of agricultural products. The study could also include looking at the necessity of a monitoring and evaluation system for agricultural produce in the different districts and/or sub-districts of East Timor.
- The program must also provide training programs on processing, storage and marketing of agricultural products to leaders and members of the farmers' organizations. Leaders of organizations must be provided capability programs to develop their managerial and supervisory skills.

## 6.2.6 Farmer's Organization and Capacity Building

### 1) Organizing Farmers

When organizing farmers into a group as one of the approaches in agricultural development, the following issues should be made clear; a) why the farmers should be organized, b) what those farmers' organizations should achieve, and c) what supports are required for them to achieve the targets. It should be understood that organizing farmers itself not be the purpose. If not, the sustainability of the farmers' organizations would not be assured.

For example, a community might be asked to form a new organization through which a proposed external assistance is expected to reach the farmers. It is however too optimistic if the farmers are merely considered to own enthusiasm or motivation to self-reliance and therefore the new organization would start functioning by itself.

If the new organization is successfully to work and eventually contribute to agricultural development, the following steps should be taken into account: a) the system to support the newly-established organization should be in place until it becomes self-supportive, b) there should be a community leader or leaders who are respected by the people and capable of managing the new organizations, c) the responsibilities and authorities of those leaders should be made clear to them and all members, d) incentives, such as honorarium, social recognition, etc., should be given to those leaders based on their contributions to the organizations, and e) the benefits of organizing themselves are clear to the farmers.

Farmer's groups should be organized carefully after paying the above-mentioned considerations. If necessary funds to organize farmer's groups will be spent disorderly or carelessly to the community without considerations of these situations, it will lead to not only prevention of conscious formation by community being lack of self-reliance awareness, but also ineffective utilization of limited resources. Therefore, these procedures should not be taken in the process of farmer's organization activities.

From these points of view, following procedure consisting of five steps is proposed for farmer's organization in East Timor;

- Step-1 : Support for building the awareness and improving the mentality of the farmers
- Step-2 : Confirmation for existing of a leader or leaders respected by community people
- Step-3 : Support to the representative organization of the community
- Step-4 : Clearness of organization's responsibility, role and rights for project implementation
- Step-5 : Raising the whole community 's commitments to the projects

The farmers in East Timor can no longer rely on the Indonesian's subsidies, to which they had been accustomed. They should therefore become able to stand on their self-supportive efforts. The farmers themselves should understand now that the situation would be getting worse unless they initiate their own actions for the betterment of their life. This requires the long-time process of awareness building. The external assistance should be in place in this regard, and this is the first step of organizing the farmers. This step is considered as the social preparation stage. The sustainability of the organization would not be guaranteed if farmers were organized without looking at the importance of social preparation.

In the first step of organizing the farmers, therefore, the support for building the awareness and improving the mentality of the farmers will be necessary. The farmers, who become aware, may also understand the importance and benefits of organizing themselves and start taking steps for collective actions.

The second step of organizing the farmers is to make sure that a) there is a leader or leaders respected by the community people and b) the leader or leaders are involved in the social preparation and following stages. A respected leader is the person who is able to manage an organization and always takes care of the whole community without being selfish. This was also stated by many farmers through interview.

The Indonesian government introduced an election to democratically select leaders even at the community level, which significantly eroded the authority and leadership of the Liurais, traditional leaders. In some communities, however, the Liurais are still respected by the people, or instead the churches are sometimes powerful in mobilizing the people and promoting the communal activities. For identifying those respected leaders in a community, therefore, the historical background of each community should firstly be reviewed.

The support to the representative organization of the community is the third step of organizing the farmers. The support should intend to strengthen the capacity of those organizations and their leaders on the community management so that they become able to mediate the conflicts among the people and facilitate the actions for their future. In particular, the whole process of the development, from the preparation of the development plans to the implementation and evaluation of the activities, is expected to be promoted by those leaders. The community people are also expected to actively participate in those processes. This requires the intensive training for the leaders in capacity building, and the well-organized community-based management structure should be established. This is considered as the step for the building of community's self-supportive capacity.

The representative organization of the community would be the existing administration for which the village or sub-village leaders elected in Indonesian time are responsible. Some communities might want to choose the new leaders and establish the new management structures. In any case, the leaders should be well respected by the community people.



The fourth step is to make clear what organization is responsible for the project implementation, and what roles, rights and responsibilities should be given to it. Prior to the implementation of any projects, the community should understand the objectives and activities of the projects, and discuss what organization is suitable for the implementation. The responsible organization might be either the community administration or another organization established for that purpose. For example, an irrigation project might require establishing a water users' association unless the community administration becomes in charge.

It should be noted here that the leaders of the responsible organization are one of the most important keys for the success of the project, but the leaders should not always be considered as committed to the project unless they are given some sort of incentives, such as money or social recognition, for their contribution. The way to raise their commitments to the project should therefore be sought, particularly at the early stage of the project.

The fifth step is to raise the whole community's commitments to the projects. The steps mentioned above, such as the improvement of the mentalities of community people, the facilitation of their active participation to the development actions, etc. are necessary for its achievement. In addition, the people's sense of ownership of the project is also important, which could be enhanced when the people contribute labor or materials to the project construction. It is obvious that the people should be made to understand and motivated that they are benefited through their contribution, and therefore the project should be able to produce a part of the profits immediately for them. This would be one of the possible ways to raise the community's commitments to the projects.

## 2) Type of Farmer's Organization and Its Effect

As per the organizations related to crop production, family or clan-based traditional farmers' groups are widely seen in the country. The several farmers are usually consisted of one group, and prepare the lands and harvest the products collaboratively. Their activities are in small scale. On the other hand, farmers of the different clans organize a bigger group to control water, farm and harvest in the areas where irrigation is possible<sup>1</sup>. All of those various groups are called *Kelompok Tani*, to most of which the farmers have been accustomed for long time. Therefore, the existing *Kelompok Tani* could be utilized when organizing farmers is thought to contribute for the promotion of crop production. The collaborative farming activities in bigger scale, when necessary, could also be promoted with the gradual expansion of the existing forms of *Kelompok Tani*.

Other approaches, which would be useful for social preparation and other steps of organizing farmers, include the formulation of livestock or fishers' groups. Those groups are also family or clan-based organizations initiated by the Indonesian government. The farmers collaboratively take care of and market their livestock, or the fishers purchase fishing equipment and go fishing together in those groups. Some forms and activities of those groups

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<sup>1</sup> This can be seen at the sub-aldeia level, according to the information given during the interview in Ailili village in Manatuto.

can still be seen<sup>2</sup>. Strengthening or establishment of those groups could be promoted along with the agricultural development since the farmers or fishers would more easily understand the importance and benefits of the group activities through the participation to those groups.

Micro finance schemes, which the ADB is currently initiating to implement all over the country, are also expected to have a significant contribution to the success of organizing the farmers, particularly at the social preparation stage. The micro finance places importance on the awareness building of the expected borrowers, and this process is considered as the social preparation. The people in the rural areas usually have very limited assets, which makes their access to the formal lending services difficult. The micro finance provides them with access to finance with much simpler procedures, if the borrowers can form a group and become mutually responsible for repayment of the group members.

The awareness building aims to strengthen the unity of the group members and eventually to assure the repayment of the loans. With the incentive that they can borrow some money if the group is well disciplined, the members can effectively learn the importance of the group responsibilities. Since the performance record of micro finance is yet to be produced in East Timor, the experiences of other countries indicate its considerable impacts on agricultural development.

Women in the communities are engaged in weaving, sawing, ceramic making or running restaurant in groups. The representative group in the country is called the Timorese Women Organization (OMT), currently organized by CNRT. Although they are not necessarily the farming groups, they would largely contribute in agricultural development, such as the promotion of agro-processing activities and the increase of farmer households' incomes as well as the enhancement of women's status.

### 3) Capacity Building

The objective of capacity building is to enhance the capacity of the major human resources in the agriculture sector, for aiming to achieve the stable agricultural productions through appropriate training of farmers and introduction of advanced farming practice. The capacities required for the agricultural development are mainly considered in two ways: one is the agriculture-related technical skill, and another is the managerial capacity. The issues of the technical skills are already discussed in the relevant sections of the report. The managerial capacities are concerned with how those technical skills are effectively utilized to achieve the goals.

The managerial capacities should include the effectiveness of a) the relevant laws and regulations, b) organizational structures and institutional arrangements of the government and c) their policies and development strategies. The other key issue is the effectiveness of other supporting organizations such as the private entities, NGOs, etc. and the coordination between

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<sup>2</sup> They are also called as *Kelompok Tani*. Refer to Chapter 3 for the details.

them and the government. Eventually, the capacity of the farmers could be enhanced if those supports well function. However, the farmers' attitudes such as the motivation for agricultural development are fundamentally essential if all those supports are to be useful. If not, the capacity building of the farmers should focus substantially on the improvement of their mentality.

Targets of the capacity building are therefore divided into the following four key stakeholders:

- Agriculture officers at the central and local levels,
- Agriculture extension workers,
- International and local NGOs, and
- Farmers

In order to realize the targets mentioned above, the following action should be taken;

- The capacity building of agriculture officers at the central and local levels should aim at strengthening the supporting systems of the government to the farmers. Since new government was just established in May 2002, it is not yet clear how the government will be structured and how capable the officers are, only the limited proposal on the supporting systems can be made here. That includes i) the definition of the roles of the agriculture officers, ii) the necessary skills of the officers, and iii) the coordinating mechanism among the officers, extension workers, NGOs and the farmers.
- For international and local NGOs, their roles are getting more important with the severely limited human and capital resources of the government. At present, however, only the limited number of NGOs seems to be strongly capable for the agriculture development, and most of those capable NGOs are active in the small scale. For the implementation of the agricultural development, it is proposed to involve NGOs wherever possible to be able to get the NGOs trained on-the-job basis. For example, the CRS is now providing 14 local NGOs with the capacity-building training, and this kind of the activities should be more promoted.

The systems for the selection of capable and potential NGOs, and for the enhancement of their capacities should be established. The coordination and evaluation systems of NGO's activities should also be included. The NGO Forum will be the possible body for the coordination and evaluation. The capacity building plans for the NGOs should be tailored based on the performances of each NGO.

For the capacity building of the farmers, a menu would include their awareness building for self-support efforts, formal and informal education including the training on various subjects, exchange visits, study tour, information campaign, participatory process with farmers in decision making-planning-implementation-evaluation, etc. The following is a part of the project design matrix (PDM) prepared through the workshop in which the central and district agricultural officers, NGOs and JICA Study Team participated. This example shows what menu of capacity building (including skills training) is considered necessary for the

increase of crop production.

### Formulated Project Design Matrix (PDM)

|  |
|--|
| Project Purpose (Maksud/tujuan Proyek) : Crop production is increased  |
| Outputs :  |
| 1. The size of production areas become big enough (Jumlah areal tanaman pangan harus diperluas)                                      |
| 2. The productivity is increased (Meningkatkan daya produksi)  |
| 3. Farmers produce surplus (Hasil bumi petani meningkat)   |
| Activities : Capacity Building (Pembangunan Kemampuan)   |
| 1. Training - irrigation mechanization (Pelatihan ttg. mekanisasi irigasi)   |
| 2. Use of abandon land (Pelatihan tentang pemanfaatan lahan tidur)   |
| 3. Training on improved agriculture method (Pelatihan ttg. meningkatkan metode pertanian)  |
| 4. Training pests management (Pelatihan ttg. pengendalian hama terpadu)  |
| 5. Training low external input sustainable agriculture (Pelatihan ttg kemandirian petani dgn menggunakan sumber daya alam yang ada). |
| 6. Information campaign (Kampanye informasi)   |
| 7. Exchange visit (Saling mengunjungi)   |
| 8. Agriculture Cooperatives are established (Membentuk koperasi pertanian) -- see the Note/Lampiran*                                 |
| 9. Community radio station & training (Stasiun radio komunikasi dan pelatihannya)  |
| 10. Trainers training center is established (Mendirikan pusat pelatihan para pelatih pertanian)                                      |
| 11. Training on terrace farming and composts (Pelatihan ttg membuat lahan persawahan bertingkat-2 & kompos)                          |
| 12. Magazine publication (Penerbitan majalah), e.g. : Use of rice to feed chicken (penggunaan kelebihan padi untuk makanan ayam)     |
| 13. Training of book keeping for farmers (Pelatihan tentang pembukuan petani)  |

\* Note: "Agriculture Cooperatives are to be established considering the following pints" - Key points for socialization of agriculture cooperatives -

- Saving mobilization (trust fund)
- Start small
- Rice mill machine, members pay to the cooperative for the service, group responsibility for operation and maintenance
- Business related training
- Exchange labor with payment to cooperative's fund
- Formal education in agriculture
- Mixture of senior and young members in a group
- Nursery of the cooperative where kids work and learn
- School garden
- Farmers organized by own initiative (not by external)

A number of the different kinds of training will be necessary in the component of capacity building of the farmers. The following are the key points to successfully implement the training, as raised in the workshop:

- Incentive to farmers without give them money but free transportation, etc.
- Select motivated farmers only
- Understand the farmers daily activities
- Form a group and select the representative
- Request of training should come from farmers
- Demonstration plots (variety of trial)

### **6.3 Livestock Development Plan**

#### **6.3.1 Livestock Development Frameworks**

##### **1) General Livestock Development Imperatives**

###### **a) Smallholder Livestock Holdings and Cross-Benefits**

Most animals are owned by households, numbering from one to a few, of almost all species. More wealthy households own large animals, consistent with their social prestige and position. Improved pig raising in households also benefit chickens; and improved fodder for cattle also benefit buffaloes, goats/sheep and horses.

###### **b) Integrated Crop and Livestock Production**

Although grassland pastures are utilized, households rely heavily on feed resources on-farm and in home yard. Improved feed availability should therefore be related to crop enterprises, like maize, legumes, fodder trees in fence lines, etc. In other words, the farming systems approach, which, in operational terms, crops and livestock technicians should implement collaborative programs.

###### **c) Subsistent Market Economy**

The present subsistent market economy has low "cash sale" demand for animals and products, thus mid-term development are targeted for home consumption, except for Bali cattle. Production for sales will be more realistically oriented to long-term, beyond 2007.

###### **d) Private Enterprise for Commercial Operations**

Commercial pig and poultry production, along with "improved breed" introductions are better left to the private sector to pursue, as entrepreneurs are market-, and global-oriented. A feed grains program (maize and legumes) can be considered towards the end of the mid-term period of 2007. Meantime, government livestock development thrusts need to focus on

smallholder and poor farmers

e) Facilitative Government Support

Livestock production will probably shift from household units to semi-, then commercial farms in the long-term. Thus in the mid-term, such development has to be facilitated by laws and integrated pro-poor programs such as export promotion for Bali cattle, micro-finance, farmers' organizations, and transport facilities. A livestock sub-division of MAF or an Agriculture Department needs to be structured to assist farmers in disease prevention and control and animal feed security with the crops subdivision. At the same time, in order to keep up with technology, through well-trained human resources, a Research and Development (R&D) program will have to be coordinated with the colleges and universities.

f) Development Scenarios

In relation to the issue of staple food self-sufficiency, the foreseeable impact on the livestock sub-sector is availability funds. Hence, if rice will be partially subsidized, less funds will be available for the whole agriculture sector. Thus, priorities were established by livestock species and by district. This prioritization effort could further be refined for each year of implementation

2) Prioritization of Development Thrusts

Considering a new government's limited budget, social impact, and relevance to development goals, the following livestock development thrusts are presented in descending order of priority. Such order may be rearranged, and/or implemented items simultaneously varied, as budget share of agriculture and related economic conditions warrant. The priorities are given the following seven schemes.

a) Expanded Veterinary Services

After almost all veterinarians went back to Indonesia, ETTA/DAA and the Joint Donors had to contend with animal health problems through diminished veterinary services. Vaccinations were done and being continued to prevent disease outbreaks of foot and mouth disease for cattle, buffaloes, and pigs; hog cholera; and new castle disease for chickens. To augment the lack of veterinarians and livestock technicians, a program has also been instituted for fielding trained private village livestock workers. Veterinary services being an overarching concern for the whole livestock sub-sector, it should be of utmost urgency for the new government to send veterinary students to Australia and elsewhere. Such effort will supplement the few veterinary students presently completing their studies in Indonesia. Until vital veterinary services are filled up below, it may not be possible to reduce the "shotgun" approach of vaccinations being done because of such lack of a diagnostic and confirmatory mechanism, by district.

The priority concerns for veterinary services, some of which are addressed in various stages by the MAF, are:

- Provision of one veterinarian per district at the shortest time possible;
- Establishment and operation of a veterinary diagnostic laboratory;
- Rehabilitation or establishment of abattoir in Dili and major animal slaughter districts;
- Institution of animal quarantine, live animal and meat inspection service;
- Feasibility study for establishing an animal quarantine station in Atauro, to quarantine incoming animals from other countries or Islands;
- Training and fielding private village livestock workers at sub-district level; and
- Establishment of a veterinary college at UNTIL (long-term plan)

b) Intensified Bali Cattle Production in Oecussi- for Export and Redistribution

Increased Bali cattle production can be pursued in two ways: a) intensifying the production in Oecussi, and b) continued redistribution of breeder female cattle to farmers in the other districts (see item 3). While these two efforts are interdependent, the former requires higher priority funding support even as extension support to farmers are provided as best as resources allow.

(1) Project Justification

- **An ideal cattle breed for smallholder farms**  
Bali cattle are hardy but gentle and easy to care for, and with good-quality meat. East Timor needs female breeders to replenish the reduced cattle population and expand the ownership of Bali cattle by smallholder farmers without importing from Indonesia.
- **Exportable commodity**  
Aside from coffee, live Bali cattle used to be "exported" to other Indonesian islands. This high demand persists, to which East Timor can continue to export under normalized trade in the near future.
- **Beef as a novelty food**  
Hamburger has become a worldwide food novelty by efforts of multinational food companies. It is a matter of time when hamburgers will be popularised in East Timor, and part of the beef patties can be supplied locally instead of relying solely on Australian suppliers.
- **A good breeding base**  
There are at least 20,000 Bali cattle in the Oecussi district, with an estimated breeding base of 8,000 heifers and cows. A conservative 50 percent calf crop could provide 4,000 weaned calves or 2,000 heifers per year. Although Bobonaro and Covalima have more Bali cattle by district, their ownership is more dispersed making it more difficult to implement a similar production program.
- **Complementary breeding-rearing livelihood opportunities**  
Without project, Oecussi district will continue to serve as specialized breeding base, selling some animals to West Timor. With project, it will be able to provide more breeder heifers and growing males for redistribution to other districts through micro

finance. Supervision of a production project will be focused in the district, with future expansion into Bobonaro and Covalima.

- Appropriate cattle rearing technology
- Farmers in the district provide fences for their home gardens. The fences include stones, which help conserve soil, and multipurpose trees such as Lamtoro and Gliricidia. Minimal effort and cost will be needed to increase such tree plantings in order to have more feeds for the dry season, along with other improved husbandry practices.

## (2) Project Components

### Improved breeding and husbandry through:

- Conduct of yearly (ending year) herd inventories to account for all animals and their owners.
- Weighing sample animals to establish improvement standards
- Selection of superior breeder bulls, to cull the rest or use for draft animals
- Provision of clean drinking water, especially in dry season
- Designating a breeding season (2-3 months) (October-November); for July-August calving

### Improved Feed Sources and Supplies

- Increase legume tree hedgerow plantings in fence lines, field borders, roadsides (Lamtoro, Gliricidia and Hibiscus)
- Increase plantings of sugarcane, rumput gajah (napier), cowpea and rice bean with maize in home gardens
- Over seeding selected grassland pastures with siratro at end of dry season, after controlled burning
- Supplement with salt (plus dicalcium phosphate)

### Veterinary and Extension Services

- Provide one full-time veterinarian for the district
- Add livestock technician up to project sub-districts; and
- Farmers/technicians' trainings

### Support Services

- Nursery for tree fodders and forage grasses in project sub-district(s)

### Logistics

- Imported seeds of Gliricidia and siratro; sugarcane seed pieces (milling variety(ies); dicalcium phosphate (and salt)
- Veterinary supplies: vaccines, antibiotics
- Animal weighing scale, 1,000 kg capacity, portable- trailer hitched, mechanical (not digital)

## (3) Redistribution of Breeder Heifers in Other Districts

Redistribution of cattle can be continued through micro-finance, following ARP I and II. Priority recipients of breeder females will be asked to repay-in-kind. This scheme, or its variations, requires recipients to return the first offspring back to the MAF or any designated



entity such as the farmers' association, PASC, NGO, etc. The returned animals are in turn passed on to subsequent priority recipients (see item e) below).

Priority redistribution areas are Covalima, Bobonaro, and Lautem; followed by (priority 2) Aileu, Ainaro, Liquica, and Manufahi (refer to Table 6.3-1).

c) Promotion of Animal Traction Use

Use of animal traction for field cultivation is envisioned to reduce the number of buffaloes being used through the traditional reneah puddling method, while maintaining the cultivated hectareage. In addition, AT use of Bali cattle in maize fields will reduce manual cultivation and increase the cultivated area per farmer.

**Table 6.3-1 District Livestock Development Priority Profile**

| District | Top Livestock Commodities | Top Three Crops (1,2,3) | Pasture Resources (ha) | Top Livestock Priority (1,2,3) |
|----------|---------------------------|-------------------------|------------------------|--------------------------------|
| Ailieu   | Got, Bfl, Ctl             | Mze, Cva, Cfe           | Nil                    | Ctl, Got, Pig/Chk              |
| Ainaro   | Bfl, Ctl, Got             | Cfe, Mze, KBn           | 1,428 (B)              | Ctl, Bfl, Got                  |
| Baucau   | Got, Bfl, Ctl             | Mze, Rce, Cnt           | 2,157 (C)              | Bfl, Ctl, Got                  |
| Bobonaro | Ctl, Got, Bfl             | Mze, Cva, KBn           | 850 (B)                | Ctl, Bfl, Pig/Chk              |
| Covalima | Ctl, Got, Bfl/Hrs         | Mze, MBn, Cva           | 800 (B)                | Ctl, Got, Hrs                  |
| Dili     | Got, Hrs, Shp             | Mze, Cva, Pnt           | 1,664 (C)              | Chk/Pig, Got                   |
| Ermera   | Got, Hrs, Shp             | Cfe, Mze, Rce           | 1,715 (B)              | Hrs, Bfl, Got                  |
| Lautem   | Bfl, Got, Ctl             | Cnt, Mze, Cva           | 23,968 (A)             | Bfl, Ctl, Got                  |
| Liquica  | Got, Ctl, Hrs             | Cfe, Mze, Cva           | Nil                    | Bfl, Ctl, Got                  |
| Manatuto | Got, Bfl, Shp             | Mze, Rce, Cva           | 950 (C)                | Bfl, Pig/Chk, Got              |
| Manufahi | Ctl, Got, Bfl             | Cfe, Cva, Mze           | 952 (B)                | Ctl, Bfl, Got                  |
| Oecussi  | Ctl, Got, Hrs             | Mze, Rce, Cva           | 4,975 (B)              | Ctl, Bfl, Got                  |
| Viqueque | Bfl, Got, Ctl             | Mze, Rce, Cva           | Nil                    | Bfl, Ctl, Got                  |

Legend : Animal species : Got.- Goat, Hrs.- Horse, Bfl., Buffalo, Ctl.-Cattle, Chk.- Chicken  
 Crops : Mze.-Maize, Cva.-Cassava, Cfe.- Coffee, Cnt.- Coconut, Rce.- Rice, KBn.- Kidney Bean, MBn.- Mung Bean  
 Pasture resources : Nil.- Small area, A-Additional grazing potential, B-Well utilized, needs improvement, C- Mostly unsuitable

Each district will establish priority areas in which to promote AT use: a) for lowland rice, and b) for upland maize plus other crops. Key farmers and technicians will be trained at the proposed animal traction facility of a multi-purpose Agricultural Training Center at the College of Agriculture farm of UNTIL in Hera.

Animal traction adoption is targeted to reach five percent replacement of reneah by year 2007 or approximately one percent yearly increase from year 2003. The whole effort is aimed at reducing the number of reneah teams by replacement with single animal units. This does not account for the replacement of animals by mechanized farming.

d) Integrated Food and Feed Crops in Smallholder Farms for Pigs and Poultry (Crops and Livestock)

Due to the largely extensive rearing system of pigs and chickens, a small increase in supplemental feeds could vastly improve animal performance in terms of increased reproductive rates and faster growth rates or shortened time to market. Most of these supplemental feeds are grown for food for the household, and includes cassava, pigeon pea, and cowpea. Sorghum and sugarcane plantings are also to be encouraged, and may require procurement of seeds and planting materials.

As a working model, increasing cultivated area from one to 1.5 ha will contribute about 100 kg additional feeds to support additional two pigs or three-hen units of chickens above the present number per household.

Promoting the crop and livestock approach through on-farm demonstrations will be a collaborative extension activity between Crops and Livestock Sub-Divisions of MAF. Priority maize growing areas will be identified by an implementation team from both offices. This includes among others, suitable maize areas in the coastal areas between Suai and Ainaro. They will be guided by a farming systems approach, which will include community participatory planning. The planning process will identify participating farmers who will determine the present level of production of their current crops (pre-project), along with animal holdings, compared to an expanded target production level which can accommodate increased livestock production (with project).

Priority areas for crop and livestock projects include Aileu, Bobonaro, Covalima and Manatuto (refer to Table 6.3-1). Dili is suited for commercial pig and poultry farming.

e) Buffalo Dairy

The native or local swamp buffalo will continue to be important in providing draft animal power, by rencah or by animal traction. As proposed in item c) above, reduction of rencah use into animal traction will increase work efficiency and reduce work done by cows or breeding heifers for more productive use, especially reproduction and /or milk production.

Over the long-term, it is recommended as the dairy animal over that of dairy cow because it is adapted to the humid tropics, easy management and availability in lowland farm conditions where it thrives.

A hindrance to dairy development is the lack of dairy and milk drinking tradition, but this could be gradually overcome by emphasizing the value of milk for home consumption. Instead of milk for drinking, it could be served in the form of candies, or added to boiled rice or coffee.

A buffalo dairy project is recommended for establishment at the College of

Agriculture farm in Hera, to serve as demonstration-cum- instruction training facility. This complements the existing animal husbandry farm at Don Bosco in Fuiloro, which includes a herd of about 12 Holstein Friesians. Promotion of a dairy buffalo project will require crossbreeding with Murrah buffalo, to obtain crossbred animals which will yield at least four kilogram milk for 300 days, compared to 1.5 kg per day for the native buffalo cow. The Hera buffalo dairy can start with about 10 selected buffalo cows or heifers, including crossbred Murrah females to be purchased from localities where Murrah bulls were introduced by the Indonesians. These will then be bred with frozen Murrah semen imported from Pakistan or India.

The envisioned Hera buffalo dairy could also serve as a breeding center for expanded crossbreeding work in farmers' herds. This is to be augmented by an Artificial Insemination facility, along with semen processing for both buffaloes and cattle. This service is to accompany extension efforts in promoting the production of crossbred Murrah x Native buffaloes, which are larger animals for draft animal power, for milk, or for slaughter purposes.

Buffalo dairy potential areas, aside from Dili (Hera), are Lautem, Baucau, Manatuto and Viqueque, in descending order of priority. Buffalo without dairy is indicated for Ainaro, Bobonaro, Ermera, Manufahi and Oecussi, in order to complement rice cropping.

#### f) Increased Goat Production

Goats and sheep are numerous especially in the coastal areas from Manatuto towards Lautem, and from Dili to Liquica, and Bobonaro. They are also raised in other districts but in smaller numbers. These northern districts are bounded by relatively dry rolling grasslands, which are extensively grazed. Although goats and sheep may not be as frequently traded as pigs and chickens, they are nevertheless valuable as wealth assets, or for meat served in special occasions and wakes for the dead. For poverty alleviation schemes, goats and sheep are more affordable and reproduce faster than cattle or buffaloes.

Producing more sheep is not advisable because of the animal's possible link with Jembrana disease for Bali cattle.

Expanded goat production areas include the cooler highlands without coffee, so that grazing pressure will be relieved in the northern coastal areas. These include the central highland areas of Aileu and Covalima, where dairy goat may also be introduced; then followed by (priority 2) Ainaro, Baucau, Dili, Ermera, Lautem, Liquica, Manatuto, Manufahi, Oecussi, and Viqueque (refer to Table 6.3-1). For dairy, suitable breeds such as Anglo Nubian could be imported to upgrade the local Indonesian breed.

Improved feed availability should be promoted, accompanied by animal distribution with micro finance, similar to the cattle scheme in section b) above. Planting of fodder trees and improved grasses like rumput gajah (napier) and kikuyu grass will be promoted. These will be accompanied by farmers' trainings in husbandry, proper animal housing and disease

and parasite prevention and control.

g) Improved Horse Production

Even as the value for transport in off- and poor roads is high, horse numbers are expected to increase by 20 percent within the five-year mid-term program. Two items are to be emphasized for improved horse production: a) increased available fodder-kikuyu grass in the highlands and tree fodders in both lowland, upland and highlands-except for Lamtoro which should not be overfed to horses. These items are also development components of the other livestock species.

Suitable horse production areas include Covalima and Liquica, particularly in the cool highlands with pastures to be improved with kikuyu grass (refer to Table 6.3-1).

### **6.3.2 District-Level Development**

As shown in Table J-1 and Table J-2 the number of the different livestock species vary by district. By matching these numbers with the dominant crops, along with the existing grassland resources, a livestock priority profile by district is shown below:

In Table 6.3-1, the livestock commodity rankings were based on numbers, without converting into animal units to emphasize relative importance by farm holdings. Chickens and pigs were not ranked, but prioritized for joint development in Dili, Manatuto and Ailieu where rice is an important crop and near the principal market. Likewise, Bobonaro is a good pig and chicken area being the top rice producer and far from Dili.

### **6.3.3 Collaborative Program Implementation**

As discussed in section 2), d) above, the farming systems approach (crops + livestock) will be the guiding principle for implementing a livestock development program. This is to better equip technicians to work with a clientele who are predominantly smallholder farmers with farm size from one to two hectares. Even the few irrigated rice farms also raise buffaloes, pigs, and chickens. The great majority of farmers raise mixed cereal crops of rice and/or maize, along with field legumes, root crops, fruit trees and one or several animals.

Farming Systems Research and Development (FSR&D) was an offshoot of the realization that development assistance was not helping poor farmers. This led to a better understanding of the plight of smallholder farmers, their survival and coping mechanisms, and ways with which to assist them in overcoming subsistence, leading to self-sufficiency then commercial farming. Other refinements to the farming systems approach include the emphasis on farmers' role in the planning process through Participatory Rapid Appraisal (PRA), then Participatory Learning and Action (PLA).

A gradual institutionalization of the farming systems approach should be incorporated into the capacity building program of MAF, starting with PRA or PLA trainings already undertaken by some sub-divisions. Such gradual re-education of technicians will lead to better understanding of smallholder farmer mixed farming technology, with minimal inputs. In practical terms, farming systems approach will make technicians appreciate the "bottoms-up" holistic approach in extension; or the process of prioritizing various alternatives with limited resources and capital of the client farmer. Technicians will also learn to balance the package of technologies, instead of only promoting their technicians' commodity orientation.

#### **6.3.4 Micro Finance Plan**

As discussed in previous section 6.2, the micro finance approach to lending to farmers is also in its development stage in East Timor, with development assistance from ADB. The micro finance initiative draws from successful examples of micro finance institutions (MFIs) in Bangladesh and Philippines. These proved how smallholder farmers, and/or housewives are able to earn additional income from borrowed capital. More importantly, such productive use of capital also enables said borrowers to repay their loans, contrary to the conventional thinking that farmer borrowers do not repay because they consider such loans as dole out from their government.

Livestock lending in-kind, or livestock banking has also succeed in various degrees including large cattle redistribution programs of Indonesia in the early 1980s. The scheme consists of lending a female breeder animal, then repaid in-kind from the first offspring. Said offspring is in turn lent to another borrower, and so on. Selected farmers are also "lent" breeder males to service the female animals, and allowed to charge a breeding fee for their care of said animals.

Refinements of animal banking have also evolved. Farmers' Cooperatives, NGOs and even local government units (LGUs) have also served as conduit for the lending mechanism, usually through grants converted into a revolving fund facility. The implementing agency is entitled to derive a markup, usually through soft loan rate of interest of about 12- 15 percent. This is to ensure that the agency could cover cost of loan servicing, and a minimal profit. Most importantly, such overhead will also insure that losses or repayment defaults could also be covered, or at least minimized, thus ensuring the fund's perpetuity.

If a cash market could be assured, animal banking facility could ideally cover small animals like pigs and chickens, or goats. Religious or other civic groups, women's organizations, and some NGOs have successfully implemented modest chicken and pig projects for poor families but mainly for home consumption. These animals could benefit more households on account of the smaller capital needed, compared to large animals. Said animals also reproduce faster, and require less feed resources that the household needs to provide.

Nevertheless, numbers should be limited, as chicken and pigs may compete for the family's food, which to a marginal swidden farm may be in seasonal shortage situation. An important part of the loan package should be provision for on-farm production of feeds, especially fodder trees, napier, sugarcane and kikuyu grass. The household should not purchase feed inputs, or the said cost item has to be included in the loan, to the borrower's clear understanding. Field legumes like pigeon pea, cowpea and rice bean also contribute some residual forage not covered in section 2, d) above.

### **6.3.5 Marketing Plan**

Large animals like cattle, buffalo and some horses are sold for meat but also for breeding and for draft animal power as well as investment, i.e., Barlaki. Because of the substantial amount involved for the smallholder farmer, some form of marketing intermediaries may be resorted to: such as traditional "middleman" buyers- who pass the animals on to butchers, or other buyers. A one-day per week livestock market mechanism is common in almost all countries, with varying degrees of sophistication and facilities, and minimal amount of "yardage fee" for the local government. Such market innovation enables seller to meet buyer, while providing revenue to the local government, i.e., district.

A slaughterhouse is a necessary facility for urbanizing communities to insure that meat is handled in a sanitary manner, and waste and materials properly handled. An accompanying live, then meat inspection service should also be part of the meat marketing channel, run by veterinarian(s) from the MAF. All slaughterhouses in all districts are presently in operational, slaughter of large animals and pigs is handled in makeshift facilities, with hardly any meat certification. Lack of veterinarians also compounds the problem.

Related to live inspection for slaughter, a veterinary quarantine service is also required to handle incoming animals from other islands or from Oecussi, as well as outgoing animals when the time comes. This in turn requires a quarantine facility, which is isolated; such as Atauro island. A feasibility study is suggested to establish such facility.

For small animals including live pigs, goats and chickens, the traditional markets serve as the sales venue. Here, some form of regulations are required to limit such live animals in a section of the market, and to control "inhumane" handling- like carrying pigs by a string at the end of a carrying stick. Such regulations will have to be imposed by local government laws or ordinances, with police powers, and corresponding penalties for violations.

### **6.3.6 Capacity Building**

The need for veterinarians is most urgent, considering the time required and cost entailed to train one. A stop-gap measure is to hire foreign veterinarians who could be

reached through the internet, perhaps at a minimum salary of 1,000 US\$ plus transportation expenses. Sending a student to Australia or other countries will cost about 6,000 US\$/ year or 24,000 US\$ for four years.

High-level manpower (M.S. and PhD.) will also be needed in National University of East Timor (UNTIL) and MAF to lead the *instruction and research and development (R&D)* effort. Balance should be made to include basic sciences and applied fields of forages, cattle breeding, buffalo production, etc. Budget constraints, and a small base from which to select candidates for advanced studies, will limit this capability within the mid-term development.

Current student loads of UNTIL and Don Bosco Fuiloro could foreseeable fill up the need for B.S. (or Inseniur) graduates at sub-district level, and provide candidates for advanced degrees. Portugal has also established a scholarship program for 500 students in all fields including agriculture. This includes slots for about 10 veterinarians.

Training technicians and farmers has to be a continuing concern, and some of the proposed pilot projects of this study will start some activities in farm mechanization, animal traction, technicians and farmers' trainings, lowland and upland agriculture, etc., to be coordinated with the MAF.

### **6.3.7 Research and Development**

The research and development (R&D) concern is another weak link in developing agriculture attuned to the global economy. The only agricultural research being done at present is by student thesis at the UNTIL. The ETPA/MAF has also established an Internet facility to access information through the network of international research centers, called "Future Seed", from the former Consultative Group of International Research Centers or CGIAR. These are the R & D centers for rice, maize, potato, etc.

Such alliance will have little use for a technical manpower with little advanced degree training. It will therefore take about five years before any such infusion will take place. Meantime, on-farm demonstration trials could be arranged between UNTIL and MAF, to be performed by technicians, with thesis student participation whenever possible. These could also be supervised by expatriate staff within the MAF sub-divisions, with funding support from MAF operations.

## **6.4 Forestry Development Plan**

### **6.4.1 Forestry Development Frameworks**

Basic policies of the country wise forestry development are to gain profits from the forest products to the inhabitants (beneficially) living near and around forestry through

rehabilitation of critical land as much as possible. Frameworks of the forestry development are to implement reforestation in the national forest and greening in the private forest area. Forest development works include mainly as following activities;

- Promotion of village's nursery
- Production of seedling
- Provision of seedling, planting, tendering and administration techniques
- Promotion and production of NTFP (Non-Timber Forest Products) i.e., jack-fruits, mango, candle-nuts, cashew-nuts and coffee, etc. and inter-crops and grass for animal grazing
- Production of fuel wood forest

#### 1) Rehabilitation of Critical Land

There are no figures for the present critical land areas, however lighting to the forest, illegal cutting and other same activity are done frequently. Moreover considering since 1999, the reforestation activities completely stop, the total areas of the critical land increased in number. The critical land areas, however, are summed up to be 480,000 ha<sup>3</sup> by Directorate General Social Forestry and Reforestation, Ministry of Forestry in Indonesia.

To conserve the land and preserve the forest and natural resources, it is desired to rehabilitate immediately. According to the Indonesian system, the forest area is divided into two categories such as the forest of inside forest area and the forest of outside forest area, the former is the national forest and the latter is the private forest.

Now the plan is drawn up according to these grouping, rehabilitation for the former (the so-called "forest") as reforestation activity, and rehabilitation for the latter (forest which near by the community in the private land) as greening activity.

#### 2) Reforestation and Regreening

The reforestation activities are conducted by the government staff from production of seedling, planting, tendering and administration that are whole activities for development of Forestry. The planting tree species are introduced early growing species and commercial species, especially Sandal-wood which is most famous three in Timor Island. These tree species are selected by most suitable environmental conditions.

The greening activities including, planting, tendering and administration works are conducted by local inhabitant and community members. The government will support the beneficiaries for development of villager's nursery and production of seedling. These activities are called as community forestry development. The community forest development is conducted in the national forest in Indonesia.

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<sup>3</sup> Source: Urutan DAS Prioritas dan Lahan Kritis: DJRLPS, Dephutbun, Feb. 2000



### 3) Community Forestry Development

The activities of community forestry development are classified into the following categories and activities;

- Development of villager's nursery
- Production of seedling: species of seedling are produced to use for local inhabitants in the forest conservation management, such as fuel wood, fruit trees, early growing species.
- Distribution of seedlings, planting, tendering and administration: to be required to the local inhabitants by distribution of seedlings, to plant the seedling in own/community land, tendering and administration by themselves. Moreover the needed expense especially will be supported by government
- Extension of forestation technique: to educate and train for the community forestry development technique to farmers
- Harvesting the forest products: the forest products from the community forest are belonged to local inhabitants, therefore the conservation of the forest is entrusted to local inhabitants.
- Introducing the agro-forestry technique: to use the land efficiently, agro-forestry technique is introduced in the community forestry development with agriculture, forestry and stock farming. Upper tree portion, which is not cut down, is adopted fruit tree production, and under the fruit trees cultivate crop production. In East Timor, such plants usually plant Sengon tree as upper tree, coffee tree as lower plant.
- Development of fuel wood forest: now it is very difficult way to get the oil for family consumption, so that the demand of fuel wood is rapidly increasing. At present the logging operation is prohibited by UNTAET/ETPA regulation, but harvesting of fuel wood is still continued. By the illegal lightening to the forest the trees are burned and blighted, there are many cases cutting to ensure the demand of fuel wood. It is necessary appropriate measures for the illegal fuel wood cutting immediately. Development of the fuel wood forest by planting the early growing tree species such as Lamtoro is quite important role.

#### 6.4.2 Forest Rehabilitation and Production Plan

##### 1) Mid-Term Development Plan

In order to realize basic development plan, the following alternative plans were set up during mid-term development from 2003 to 2007.

### Alternative Forest Rehabilitation Plan

| Year      | Reforestation |         |        |        | Regreening |         |         |        |
|-----------|---------------|---------|--------|--------|------------|---------|---------|--------|
|           | Plan-1        | Plan-2  | Plan-3 | Plan-4 | Plan-1     | Plan-2  | Plan-3  | Plan-4 |
| Entirely  | 177,107       | 136,341 | 35,250 | 8,025  | 305,564    | 305,564 | 189,000 | 42,585 |
| 2003      | 35,600        | 9,000   | 2,350  | 535    | 61,400     | 19,700  | 10,600  | 2,385  |
| 2004      | 35,600        | 9,000   | 2,350  | 535    | 61,400     | 21,650  | 10,600  | 2,385  |
| 2005      | 35,600        | 9,100   | 2,350  | 535    | 61,400     | 24,400  | 12,100  | 2,730  |
| 2006      | 35,600        | 9,150   | 2,350  | 535    | 61,400     | 25,508  | 14,100  | 3,175  |
| 2007      | 34,707        | 9,197   | 2,350  | 535    | 59,864     | 24,709  | 15,600  | 3,520  |
| 5-Years   | 177,107       | 45,447  | 11,750 | 2,675  | 305,564    | 115,967 | 63,000  | 14,195 |
| Remaining | 0             | 90,894  | 23,500 | 5,350  | 0          | 189,597 | 126,000 | 28,390 |

Plan-1 for both reforestation and regreening schemes is execution of whole critical land within five years, Plan-2 is originally planned by Indonesian Government. Plan-3 is planned by Forestry Division through the East Timor Foresters' Group (ETFOG) to consider about ability of institution, and Plan-4 is the most practical plan taking into account budget available and capacity of government structures by JICA Study Team. Finally, Plan-4 is recommended as a most conservative schedule within proposed alternatives.

#### 2) Proposed Tree Species

Most recommendable tree species for rehabilitation of critical forest land are listed in the following table from the view points of more early growing tree species and profitable fruits trees.

#### Proposed Trees and Fruits Species

##### Reforestation

| Local Name      | English Name          | Growing degree | Uses   |
|-----------------|-----------------------|----------------|--|
| Jati            | Teak                  | Slow           | Furniture, Interior, Carving,                              |
| Kayu merah      | Narra                 | Slow           | Furniture, Cabinet, Musical instrument, Flooring, Vehicles |
| Mahoni          | Mahogany              | Slow           | Furniture, Interior, Plywood, Box                          |
| Eukaliptus      | Poplar gum            | Fast           | Fuel wood, Pulp  |
| Eukaliptus      | Eucalyptus            | Fast-Moderate  | Post, Sleeper, Flooring, Board, Vessel, Pulp               |
| Sengon          | Sau tree              | Fast           | Cabinet, Box, Furniture, Pulp, Match-stick                 |
| Cemara          | Mountain ru           | Fast           | Scaffold post, Sleeper, Fuel wood                          |
| Mangium         | Acacia mangium        | Fast           | Frame, Board, Cabinet, Fuel wood, Pulp                     |
| Kayu titi       | Indian bulang Yermane | Fast           | Box, Match-stick, Pulp, Plywood, Fodder (Young branch)     |
| Nitas/Kelumpang | Bastard poon          | Moderate       | Lumber   |
| Cendana         | Sandal-Wood           | Moderate-Slow  | Box, Carving, Fan, Perfume, Joss stick, Oil                |

## Regreening

| Local Name | English Name          | Growing degree | Uses   |
|------------|-----------------------|----------------|--|
| Eukaliptus | Poplar gum            | Fast           | Fuel wood, Pulp  |
| Eukaliptus | Eucalyptus            | Fast-Moderate  | Post, Sleeper, Flooring, Board, Vessel, Pulp           |
| Sengon     | Sau tree              | Fast           | Cabinet, Box, Furniture, Pulp, Match-stick             |
| Cemara     | Mountain ru           | Fast           | Scaffold post, Sleeper, Fuel wood                      |
| Mangium    | Acacia mangium        | Fast           | Frame, Board, Cabinet, Fuel wood, Pulp                 |
| Kayu titi  | Indian bulang Yermane | Fast           | Box, Match-stick, Pulp, Plywood, Fodder (Young branch) |
| Kemiri     | Candle-nut tree       | Fast           | Candle-nut oil, Match-stick, Box, Woodworking          |
| Lamtoro    | Ipil ipil             | Fast           | Fuel wood, Furniture, Building, Fiberboard, Fodder     |
| Asam       | Tamarind              | Fast-Moderate  | Seasoning, Refreshing drink, Liquor(Flesh),            |
| Nangka     | Jack-fruit tree       | Moderate       | Fruit(Flesh)   |
| Mangga     | Mango                 | Moderate       | Fruit(Flesh)   |

### 3) Process of the Development

#### Production of Seedlings

Owing to tree species the planting spaces are different, so that reason number of seedling are also different. Number of seedling production is different to planned rehabilitate area. Unit price for each tree species is estimated some difference. Approximate unit price of seedling is US\$ 0.5 (5,000 Rp) per seedling, and appropriate US\$ 1.0(10,000 Rp) for fruit tree seedling.

#### Forestation and Tendering

Forestation activities are done as land preparation, planting, supplying water, supplementary planting, cleaning cutting, fertilizing, administration and other activities. The tendering after planting is done as cleaning cutting, thinning and administration activities. The standard planting space is 3 m x 3 m (1,111 trees/ha), another planting spaces are 5 m x 5 m (400 trees/ha), 8 m x 8 m (156 trees/ha) for Kemiri and 10 m x 10 m (100 trees/ha) for fruit trees. Ten percent of planted tree is planted as supplementary planting. The forestation costs are estimated at US\$ 1.300 for reforestation activity and US\$650/ha for greening.

### 6.4.3 Production of Fuel Wood

#### 1) Demand of Fuel Wood

The present statistic data shows a little production of fuel wood as tabulated in Table G-5. However, actual situation is that big number of fuel wood is produced and consumed in the country wise. Indonesian Ministry of Forestry estimated at 0.5 cu.m/capita/year of demand of fuel wood in the 15 years (1985-2000) Forestry Plan.

Result of village survey conducted JICA Study Team indicated that average consumed fuel wood became about 1.7 cu.m/person/year, while the projected demand is 0.50 cu.m/cap/year as mentioned above.

#### Demand of Fuel Wood till 2007

| Item               | 2001    | 2003    | 2004    | 2005    | 2006    | 2007    | 2-17      |
|--------------------|---------|---------|---------|---------|---------|---------|-----------|
| Population         | 737,811 | 783,073 | 807,030 | 831,927 | 857,805 | 867,115 | 1,074,375 |
| Demand (cu.m/cap.) | 1.698   | 1.698   | 1.698   | 1.698   | 1.698   | 1.698   | 1.698     |
| Demand (1,000cu.m) | 1,253   | 1,330   | 1,370   | 1,413   | 1,457   | 1,472   | 1,824     |

Note : Estimated based on average ratio of increase population (1980-1998) and Report of Population (Civil Registry Unit:2 July 2001).

#### 2) Supply of Fuel Wood

As mentioned above, Indonesian Ministry of Forestry planned to product 215,695 cu.m (215,695 ha x 1.0 cu.m/ha) from productive forest area, and 121,296 cu.m (242,592 ha x 0.5 cu.m/ha) from plantation area, agriculture land and home garden, and the production reaches 336,991 cu.m in total. The shortage of 472,170 cu.m for demand can be expected from local small plantation and private forest.

Until now forest inventory have not been done unfortunately. Therefore the potentials of forest and sustainable supply of wood production are unknown. It is need to executed forest Inventory immediately.

Expected production for the target year 2007 can be estimated as follows;

|                     |   |                             |                 |
|---------------------|---|-----------------------------|-----------------|
| - Productive forest | : | 227,000 ha x 3.0 cu.m./ha = | 681,000 cu.m.   |
| - Plantation forest | : | 368,000 ha x 2.0 cu.m./ha = | 737,000 cu.m.   |
| Total               |   |                             | 1,417,000 cu.m. |

#### 6.4.4 Production of Timber Wood

##### 1) Demand of Timber

According to the Indonesian Ministry of Forestry estimates, the demand of timber is about 0.1cu.m/capita/year as tabulated in Table G-9..

##### 2) Possibility for Production of Timber

It is very difficult to assume the sustainable plan for production of timber without proper forest inventory. For the reference of plan formulation, Indonesian Ministry of Forestry classified the forest condition in each forest group as shown below;

Classification of Production Forest

| Name of Forest Group | Area (ha)       | Forest Area (ha) |                 | Tree in Alang-Alang Land (ha) | Bush & Shrub (ha) |
|----------------------|-----------------|------------------|-----------------|-------------------------------|-------------------|
|                      |                 | Over 80 cu.m/ha  | 40-79 cu.m/ha   |                               |                   |
| Fohomesac            | 335,656         |                  | 6,564           | 29,092                        |                   |
| Cailaco-Tanamalau    | 152,968         |                  | 8,061           | 119,361                       | 25,546            |
| Querilau Lauberio    | 233,381         | 6,251            | 4,184           | 99,296                        | 122,650           |
| Laumeric             | 9,531           |                  |                 | 8,517                         | 1,014             |
| Metiboat             | 12,938          |                  |                 | 11,682                        | 1,256             |
| Uailulaurs           | 5,000           |                  | 204             | 3,571                         | 1,225             |
| Laretame             | 25,625          | 433              |                 | 4,561                         | 20,631            |
| Boicau               | 28,125          | 6,559            |                 | 1,668                         | 19,898            |
| Silvicola            | 4,375           | 4,375            |                 |                               |                   |
| Seracate             | 26,625          | 26,625           |                 |                               |                   |
| Jaco                 | 1,600           | 1,600            |                 |                               |                   |
| Apara                | 48,125          | 21,536           |                 |                               |                   |
| Isuum                | 11,375          |                  |                 | 11,375                        |                   |
| Manacoco             | 10,625          |                  |                 | 10,625                        |                   |
| Riehato              | 6,437           |                  | 415             | 6,022                         |                   |
| Hatubute             | 10,968          |                  | 923             | 10,045                        |                   |
| Guguleur             | 27,312          |                  | 9,335           | 17,977                        |                   |
| Balibo               | 8,281           |                  |                 | 8,281                         |                   |
| Nitibe               | 26,250          |                  |                 | 26,250                        |                   |
| Seli                 | 15,625          |                  |                 | 15,625                        |                   |
| Total (Proportion)   | 699,822 (100 %) | 67,379 (9.63 %)  | 29,686 (4.24 %) | 400,542 (57.23 %)             | 202,215 (28.90 %) |

Source: Kanwil Dep.Kehutanan Timor Timur 1986  
(Peta Tegakan Hutan Indonesia Tahun 1980)

Judging from the above table, there is only 13.87 percent areas with perfect condition of forest against whole forest area, and there is no ability of timber production. UNTAET

/ETPA enacted regulation No.17/2000 on June 8th, 2000 to prohibit the logging operation and export timber in order to reduce the forest and ensure the sustainable forestry.

The present reconstruction materials depend on import from Indonesia. The small scale logging (less than 3 cu.m ) still done in individual case. The standing stock should be gotten hold by forest inventory the first. Until sustainable timber production program is drawn up, timber production should be stopped. Therefore, timber materials are depended on only import one for the time being. For this reason the plan of timber production is not proposed.

#### 6.4.5 Production of Candle-Nut Oil

Candle-nut tree (Kemiri) is planted from old times, and the Candle-nut is shipped to Java Island, Indonesia. In Indonesian period, this tree is introduced positively for local inhabitants measures, but now the shipping country is not clear, so that farmers still have many Candle-nut.

The global demand of the Paulownia (Aleurites spp.) oil that is produced from the Paulownia-nut is still big. The Candle-nut oil is same too. If there is a certain volume measure, the Candle-nut oil can be put on the market.

Some trader needs 2,000 ton oil per year (equivalent volume of Candle-nut; 10,000 ton per year). To conserve the land and to promote people's participation for the greening activity, and to get the more cash income for farmers, promotion of Candle-nut production is some possibility. But now the oil price is depend on the very big volume for the Chinese market.

In this study to commercialize the Candle-nut oil production in collaboration with "regreening schemes" as mentioned previously in the community forest development plan.

##### Proposed Target Production and Area

- Candle-nut production per year : 10,000 tons
- Average yield : 468 kg/ha
- Planted area : 4,238 ha
- Productive area : 3,575 ha
- New area to be expanded : 18,000 ha

##### Plantation of Candle-nut Tree

- Limited plantation area due to climate and soil condition  
Temperature (21-27 ° C), rainfall (1,100-2,400 mm/year, 80-110 day/year),  
Humidity (75 %), gentle wind, height above sea level (0-1,200 m),  
Soil (mixed with sand and clay, tender; PH:6.0-6.5)
- Need green manure

In this trial estimation, total area to be planted for candle-nut tree becomes to be 18,000 ha. However, the planting areas during the mid-term development period (five year periods) is planned to be 1,300 ha, considering the available amounts of budget and capability of the related government organization.

#### **6.4.6 Preparation of Forest Law, Regulation, Rule and Required Data**

Since the law and ordinances in Indonesian period are not applicable to an actual situation of East Timor forestry, these ordinances will be issued immediately. Necessary laws and regulations are listed up as follows;

- Forest area based on harmonization between consensus forest land use planning and district spatial planning
- Forested and non forest area
- Statistic of forest resources
- Total volume and average on forest
- Conservation area
- Forest boundary delineation
- Control to forest fire

#### **6.4.7 Institution Development and Personal Capacity Building**

In order to preserve and administrate forest proper, the needed institutions development and personal capacity building are important factor for the appropriate development of forest and environmental conservation in the country. The present district forestry officers who are posted in each districts, will be established the District Forestry Office and set up the personals to administrate the forest, extend forestation, control timber production, manage nursery, protect wild fauna and flora, promote the community forestry and take a measure for local residents.

### **6.5 Fishery Development Plan**

#### **6.5.1 Fishery Development Frameworks**

As described in Chapter 3.9.4, the present level of fishery production in East Timor, that is very roughly estimated in a range of a few or several thousands tons, seems not likely to be able to satisfy a potential demand for the national diet life, namely, fish's contribution to animal protein. To satisfy the potential demand in the minimum, that may be figured to be somewhere between 14,000 tons and 15,000 tons in sardine conversion bases, the present production level would have to be increased to three or four times.

This target, a sharp increase of fishery production, would be able to attain, for an example, by establishing a modernized fishing fleet with intensive investment. However, past experience shows that this type of corporate management generally tends to be directed towards overseas market so as to rationalize its costly operation structure. Worst of all, this intensive way gives usually no benefit to a majority of the present fishing fleet and leaves it undeveloped. Meanwhile, by improving and expanding the present fleet that comprises many groups of dugout canoes scattering over the whole coastline, it would take a long time to reach such a production level. Any project aiming to expand the fleet scale to three times more in a limited term, for an example within coming five or ten years, seems unfeasible, because an investment of huge amount would be required, not only in boat-building but also in other related sub-sectors like fish distribution and marketing.

Another difficult issue exists in the lack of basic statistics in the fisheries sector. This is shown by the fact that all figures in this chapter come from rather rough estimates. The lack of accurate figures does not permit a closer analysis. This leaves meaningless the estimates to any evaluation on a partial attainment to expand the fishing fleet. For these reasons, a planning approach based on food demands is difficult to apply for the fishery sector in East Timor. It seems that the approach from a wider entrance is more practical for planning on this sector. In the following chapter, the development demands in the fishery sector are analyzed to know what sort of problems are held by each sub-sectors and to see how these problems can be solved.

### **6.5.2 Development Demands Analysis**

The fishery sector extends over many sub-sectors. When any sort of development plans are needed to formulate in one of the sub-sectors, it is desirable to study on other relevant sectors at the same time, as these can be usually closely related to each other in view of project engineering. In this report, the fishery sector in East Timor is defined to comprise 14 sub-sectors. In these fishery sub-sectors, those that are not included but should have been included when a complete coverage is required are inland fishery, sports fishing, fishery mutual insurance, and some other minor issues. These issues are discarded in this study.

To have an overall view over these sub-sectors, Table H-6 is attached in the annex. This table summarizes the present situation of 14 sub-sectors, the present and foreseeable problems, which were discussed in paragraph 3.16.4 already but more issues are presented here, and the Study Team's suggestions on the measures to solve these problems. The problems and solutions are described in term bases to clarify development demands that may change in course of developing stages. In case of the fishery sector, it is proposed to have three plan terms to set up a scope where a full development of the sector in East Timor is assumed. That is, mid-term (2003 to 2007), long-term (2008 to 2017), and future (2018 -). It should be noted the table includes some issues that can be resolved by the routine works of the fishery administration. It also describes on the issues that do not need to solve or develop because these seem not to have serious development demands at a specific stage or any stages of



development in this sector of East Timor.

For the mid-term development plan to develop the fishery sector, the Study Team suggests five projects; Boat-Building Project (Phase III), Fishing Gears Improvement Project, Fish Landing Survey, Project for Small-scale Fishery Enterprise, and Baseline Survey for the Community Based Fishery Management (CBFM). The following table gives reasons why these five projects are prioritized in the mid-term development plan and other sub-sectors are not.

Summary of the Proposed Mid-Term Development Plan

| Sub-sectors<br>(Project Title)                               | Why these five projects are prioritized  |
|--|--|
| Fishing Vessels:<br>(Boat-Building Project,<br>Phase III)    | AusAID (phase I, completed) and ICEIDA (phase II) have assisted a boat-building project. These had different objectives, but as a result, it helped development of more seaworthy open boats. The boats built by phase (I) have not come into wide use so far. Phase (II) adopted Indonesian type that was once used in East Timor, some being still used now, and has a possibility to become widespread in the sector. In phase (I) and (II), appropriate types of boat of low building costs have not been developed or attained. More concentrated program for this objective is needed.                   |
| Fishing:<br>(Fishing Gears<br>Improvement Project)           | A reason why a piece of fishing gear is being used for different fishing methods may be explained by shortage and high prices of fishing gears. While a new canoe can be purchased for 2,500,000Rp, a complete set of gillnets costs 800,000Rp. 1,500 rolls of gillnets donated by China are expected to decrease the current prices. Generally, fishing gears are expendables. It is possible to try to assemble fishing gears of appropriate specifications by using locally available materials even partly. Especially the less effective fishing gears like trolling should be improved in such a manner. |
| Fishing,<br>Fishery Administration:<br>(Fish Landing Survey) | Presently catch volume, in any level of districts or East Timor, are totally unknown. Because of the current institutional and budgetary limitation in FMED, collection of the primary data is not included in immediate or foreseeable administrative actions. It should be tried, even under such limited conditions, to identify measures to enable the data collection.<br><br>Fishery statistics founds the fishery administration. Any policy making or development planning towards sustainable fishery is not possible without the statistics.   |
| Shore-based Facilities of<br>Fishing Harbors,<br>Marketing:  | Due regards should be paid to following points when designing any plans for shore-based facilities or fish marketing:  |

| Sub-sectors<br>(Project Title)   | Why these 5 projects are prioritized   |
|--|--|
| <i>(Project for Small-scale Fishery Enterprise)</i>  | <p>1) The fishery strategy says all profitable projects should be managed by the private sector.</p> <p>2) As proposed by the Joint Donors Mission, it is possible that the government will take a policy that the beneficiary should pay for a project, especially in case of project that yields financial gain.</p> <p>3) Operation and management of the subject facilities seem to deeply depend on operator's individual capability of cost management as well as his/her willingness and efforts for business operation.</p> <p>To pursue these conditions and develop relevant facilities such as ice plant or cold storage in local sites, it is appropriate to install a fund that aims to accelerate incorporation of small-scale enterprises for this sub-sector. In case that the support is to make by providing operators with these facilities, it is needed to plan a unit of building and equipment within such a cost that an individual operators can repay.</p> |
| Fishery Administration:<br><i>(Baseline Survey for the Community Based Fishery Management)</i> | <p>Fishing vessels without engine or with engine of 15PS or less are the very thing of the present fishing fleet in East Timor. It may be risky to handle them like the free fishery without overall limitation of fishing gears and methods as directed in the fishery strategy. Even if these are put in hands of the CBFM regime, the responsibility and involvement of the administration will remain after all, so far as fishing grounds exist in the public waters.</p> <p>Prior to the institutionalization of the CBFM, it will be needed to study on details of the traditional customs for fishing management. Some officers say such customs have become ineffective after continued political confusions. By results of the suco inventory survey, however, around 50% of the surveyed coastal sucos reported to keep various customs to manage their fishing.</p>  |

Sub-Sectors Not Prioritized in the Mid-Term Development Plan

| Sub-sectors           | Why these sub-sectors are not prioritized   |
|-----------------------|---|
| Inland Water Fishery: | <p>Other than Ira Lalaro Lake in Lautem, there seems no inland water in East Timor where capture fishery is possible. Ira Lalaro Lake extends over 20 km and the water level changes greatly by season. The subsistence fishery is operated in a part of the lake. Before developing this and increasing its production, though the necessity of development appears relatively lower, environment assessment and ecological survey should be preceded.</p> |

| Sub-sectors   |                | Why these sub-sectors are not prioritized   |
|---|----------------|---|
| Aquaculture:  | Freshwater     | World Bank's support that includes freshwater aquaculture is scheduled to start for six districts from September 2001. The Japanese technical cooperation is requested to continue as well. The present objectives are reduction of production costs of fries and rehabilitation of Same station and four others. Continued support by means of the technical cooperation is desirable. For repairs of water leak in concrete tanks in the stations and other renovation works, some pre-coordination will be needed, as these are difficult to undertake in a usual scope of the technical cooperation.  |
|   | Brackish water | Though not confirmed yet, it is said that idling brackish ponds cannot be handled with because of land tenure issues. The fishery strategy limits capture of natural fries. Though there are request for operation of brackish ponds from fisher's groups (Tibar), administrative action and decision should precede beforehand.  |
|   | Sea water      | Cage or pond culture for grouper or sea bass is technically possible in either of intensive or extensive way. It might be suggested to ask experts for the above technical cooperation to undertake a trial survey on site conditions and availability of fries to prepare for further studies.   |
| Engine for Fishing Vessel:  |                | Before 1999, OBMs totaled 630 units. By the violence in the year, these were largely decreased. It is supposed many fishermen have experiences to operate OBM. Some fishermen seem able to repair most troubles if spare parts are available and already have knowledge on how much fuel oil costs them for a fishing trip, based on experiences. It appears that the fishermen do not so much need guidance or training accompanied with mobilization of canoes. The administration will need to check utilization of and follow up the OBMs from China to avoid obstacles on repairs and purchase of spare parts<br>In the Chinese grant aid, 300 units of OBM are included and these will accelerate the mobilization of canoes at once. In Dili, a few OBM dealers have started or resumed their business already. OBMs, including long-tail type, are imported mostly from Surabaya. |
| Marine Fishery Resources, Fishing Harbors, Fish Processing, Consumption, Export, Research and Education |                | Refer to Table H-6.   |

### **6.5.3 Boat-Building Project (Phase III)**

#### **1) Objectives and Scope**

The project aims to develop open (un-decked) boat of low building costs and of appropriate size and specifications to attain better seaworthiness than existing canoes, and also to transfer boat-building technology to trainees.

After the appropriate type of boat(s) is developed, the planned boat is tested for a certain time of period and financially analyzed. The project is then to be privatized and managed by the private sector under supervision of the administration, for an example, through group of boat builders or board of directors if boatyard(s) is incorporated. The project includes the fund of a certain amount that is to make available to fishermen who desire to purchase the planned boat. The project site is to be based at the boatyard in Hera Fishing Port.

#### **2) Project Components**

To implement the project, following components will be required; project manager, boat-building instructor, two to three assistants, renovation of the existing boatyard, tools and machineries, materials to build boats, safety equipment for sea trials, and fund for credit. The amount of the credit fund is roughly estimated as 800,000US\$.

#### **3) Term of Implementation : Two to five years**

#### **4) Institutional Framework**

Those that are involved to implement this project will be the fishery administration, a project team for boat-building, and qualified private boatyard(s) and a financial institution to manage the credit fund.

#### **5) Benefits : Increase of fishing trip days, longer life of fishing vessels.**

### **6.5.4 Fishing Gear Improvement Project**

#### **1) Objectives and Scope**

This project aims to improve the fishing efficiency of trolling gears and gillnet widely observed in canoe fishing in East Timor. Some trials to introduce different types of trolling gears and gillnet are undertaken to find solution to improve the fishing efficiency. The project also aims to find ways to use locally available materials to assemble the gears as much as possible, especially for the trolling gears. The project is based at Hera Fishing Port.

## 2) Project Components

To implement the project, following components will be required; a fishing gear instructor, two to three assistants, a boat operator, small-scale fishing boat, materials to assemble fishing gears, hand tools, and dissemination materials.

3) Term of Implementation : One year.

## 4) Institutional Framework

Those that are involved to implement this project will be the fishery administration and a project team that can be organized together with the team for Boat-Building Project (Phase III).

## 5) Benefits

Increase of fishing efficiency, decrease of fishing effort in the coastal waters through widening of choice of fishing grounds.

### 6.5.5 Fish Landing Survey

#### 1) Objectives and Scope

This project aims to do a series of site survey at designated fish landing points to collect the primary data of fish catch. It is also aimed to find appropriate ways for data collection, in both of institutional and methodological aspects. 22 to 33 sites in the north and south coast are to be surveyed in the way as specified beforehand.

#### 2) Project Components

To implement the project, following components will be required; a project manager, 22 to 33 enumerators, mobilization to deploy the enumerators, devices and utensils for the survey and data compilation.

3) Term of Implementation : 16 months.

#### 4) Institutional Framework

Those that are involved to implement this project will be the fishery administration and a survey team.

## 5) Benefits

Averaged catch per canoe and number of canoe operated per day that may change by sites and seasons will be made known. Appropriate way to collect the primary data for fish catch statistics will be identified.

### 6.5.6 Project for Small-Scale Fishery Enterprise

#### 1) Objectives and Scope

This project aims to accelerate incorporation of small-scale enterprises in the fishery sector by providing the East Timor nationals, those who is well motivated to operate such enterprises, with financial source. It is intended that, by making the investment enable, fish marketing facilities that include ice supply for fish preservation are able to be established by the private sector in the most appropriate way to meet the local conditions and also to minimize the project costs. In total, 22 operation bodies in 11 coastal districts will be covered by the project.

Qualification of applicant, conditions of loan, scope of financed facilities and other conditions are subjected to further feasibility studies. Small Enterprise Program (Phase I and II) that has been assisted by TFET may give a successful precedent for this project.

#### 2) Project Components

To implement the project, following components will be required; a project supervisor and fund for credit. The amount of the credit fund is roughly estimated at 1,400,000US\$.

#### 3) Term of Implementation : Two to five years

#### 4) Institutional Framework

Deeper involvement of the fishery administration is needed to pre-qualify the applicants and to register small enterprises financed under this project. Others that are involved to implement this project will be a project supervisor, who can be organized together with the team for *Boat-Building Project (Phase III)*, and a financial institution.

#### 5) Benefits

Through the operation of marketing facilities, fish distribution is more activated and volumes of transaction and flow into the urban areas (Dili, Baucau) are increased especially in the good fishing seasons that vary in the north and south coast. Days to keep fresh fish are made longer where ice is not available.

### **6.5.7 Baseline Survey for Community Based Fishery Management**

#### **1) Objectives and Scope**

This project aims to undertake a series of interview with representatives of fisher's group or chief of aldeia to know the present or past rules for fishing practices that originates in, or were transmitted to, the aldeia in some time of its history. All the rules, which may relate to limited and unlimited use or conditions of fishing (gears, methods, grounds, form of operations, seasons), commons to use the resources with adjacent aldeias, penalties in case of violation, and arbitration on fishing troubles, will be studied.

The interview is made at the 40 selected coastal aldeias in the sucos that reported the traditional fishing rules in the Village Survey (Suco Survey) in June 2001, as well as in other similar coastal sucos. The information on these traditional rules in the coastal communities forms basic references that will be needed when the administration builds the jurisdictional system for the community-based fishery management.

#### **2) Project Components**

To implement the project, following components will be required; A project researcher, an assistant, and mobilization.

3) Term of Implementation : Eight months.

#### **4) Institutional Framework**

Those that are involved to implement this project will be the fishery administration and a survey team that can be organized together with the team for Fish Landing Survey.

#### **5) Benefits**

The basic references to build the jurisdictional system necessary for the community-based fishery management are obtained.

### **6.6 Project Costs for Mid-Term Integrated Agricultural Development Plan**

Project costs for mid-term development plan were preliminarily estimated for the following both cases based upon the proposed development plan in the aspects of agriculture, livestock, forestry, and fishery sectors, that is full-scale development and minimum-scale development cases.

The former case is the full-scale development to meet the necessary requirements of food demand and supply, balanced land uses considering adequate crop and forestry land uses,

under strong support by Timor Gap revenues. On the other hand, the latter case is the minimum-scale development under restricted revenues from Timor Gap revenues. In this plan, project plan is in minimum level with limited rehabilitation of damaged irrigation schemes (light to medium damaged areas) and capacity building for the related fields.

The estimated project costs for mid-term development are summarized as show below with three categories of cost such as government, donors and community. The contents of government burden in case of full-scale development consists of i) agricultural extension financial subsidization and ii) capacity building for government staff and farmers representative, while that in case of minimum-development is only the costs for former contents, as shown in Table U-1 and Table U-2. The portion of community burden of the costs is decided to be labor charges.

Project Costs for Mid-Term Integrated Agricultural Development Plan

(unit: '000 US\$)

| Year                          | 2003/04 | 2004/05 | 2005/06 | 2006/07 | 2007/08 | Total  |
|-------------------------------|---------|---------|---------|---------|---------|--------|
| <b>Full-Scale Development</b> |         |         |         |         |         |        |
| Government                    | 5,414   | 3,117   | 3,117   | 3,117   | 3,117   | 17,882 |
| Donors                        | 14,578  | 9,349   | 9,085   | 9,354   | 9,346   | 51,712 |
| Community                     | 2,146   | 1,551   | 1,391   | 1,341   | 1,301   | 7,730  |
| Total                         | 22,138  | 14,017  | 13,593  | 13,812  | 13,764  | 77,324 |
| <b>Min-Scale Development</b>  |         |         |         |         |         |        |
| Government                    | 2,275   | 2,246   | 2,246   | 2,246   | 2,246   | 11,259 |
| Donors                        | 8,759   | 2,439   | 2,439   | 2,439   | 2,430   | 18,515 |
| Community                     | 943     | 98      | 98      | 98      | 98      | 1,335  |
| Total                         | 11,977  | 4,783   | 4,783   | 4,783   | 4,783   | 31,109 |

Note: Details are given in Table U-1 and U-2.

The rate of projects costs against the total revenues including donor's financing amounts is estimated as shown below. As the results, it could be proved that agricultural sector in case of full-scale development will need the budgets equivalent to about nine percent of the total revenues including donor's finance amount except for 2003/04 year begets, for which about 11 percent of begets will be needed. According to the data on the East Timor Combined Sources Budget in 2001/2002 prepared by Cabinet Minister for Finance, ETTA, Agricultural sector used 21,967 thousand US\$ in the year, equivalent to 7.2 percent of the total budgets of 304,681 thousand US\$.

On the other hand, in case of minimum-scale of development the rate is around three percent except for 2003/04 year, due to minimum-scale development of the sector.



**Rate of Project Cost against the Total Amounts of Revenue and Donor's Financing**

(unit: '000 US\$)

| Item                          | 2003/04 | 2004/05 | 2005/06 | 2006/07 | 2007/08 | Total   |
|-------------------------------|---------|---------|---------|---------|---------|---------|
| <b>Full-Scale Development</b> |         |         |         |         |         |         |
| Project Costs 1/              | 19,992  | 12,466  | 12,202  | 12,471  | 12,463  | 69,594  |
| Revenue+Donor's Finance 2/    | 170,400 | 151,200 | 135,400 | 141,300 | 147,500 | 745,800 |
| Percentage (%)                | 11.7    | 8.2     | 9.0     | 8.8     | 8.4     | 9.3     |
| <b>Min.-Scale Development</b> |         |         |         |         |         |         |
| Project Costs                 | 11,034  | 4,685   | 4,685   | 4,685   | 4,685   | 29,774  |
| Revenue+Donor's Finance       | 170,400 | 151,200 | 135,400 | 141,300 | 147,500 | 745,800 |
| Percentage (%)                | 6.5     | 3.1     | 3.5     | 3.3     | 3.2     | 4.0     |

Note; 1/ No inclusive of costs shared by community

2/ Derived from IMF, Donor Meeting Staff Statement, June 2001

And, for a reference, moderate development plan, which stands for intermediate case between full- and minimum-development plans was additionally studied in terms of implementation plan and preliminary project costs. The results of study are shown in Table U-13 and Figure U-2. This moderate development plan indicates the plan subtracting the forest land rehabilitation plan, which is deemed to be low priority from viewpoint of the development priority (see paragraph 9.3 "Appropriateness of Technical Level") from the full-development plan case.

**6.7 Relation between Development Key Policy Issues proposed by Agricultural Joint Donor Mission and Mid-Term Integrated Agricultural Development Plan**

Table 6.7-1 indicates the relation between development key policy issues for agricultural sector proposed by Agricultural Joint Donor Mission Meeting held in Dili in November 2001 and the mid-term integrated agricultural development plan proposed in this study.

**Table 6.7-1 Relation between Agricultural Joint Donor Mission Key Policy Issues and Mid-Term Integrated Agricultural Development Plan**

| Agricultural Joint Donor Mission Key Policy and Recommendation                |  |   |   |   | Mid-Term Integrated Agricultural Development   |
|---|--|---|---|---|--|
| Policy Assistance Matrix  | Key Policy Issues  | Recommendation  | Possible Donor Assistance   | Timing  |  |
| <b>GENERAL</b>  |  |   |   |   |  |
| 1. Agriculture Strategy   | Strategy and Medium Term Plan need urgent completion   | <ul style="list-style-type: none"> <li>In-house visioning exercise</li> <li>High level policy advisors</li> </ul>   | ARP II<br>JICA  | January 2002  | - Under preparation of Agricultural Development Plan   |
| 2. Capacity Building  | MAF staff need targeted adm. and technical training  | <ul style="list-style-type: none"> <li>Training needs prioritization</li> <li>In-country training</li> </ul>  | All major donor funded projects<br>UNDP Capacity Building Program                                 | As soon as possible   | <ul style="list-style-type: none"> <li>Implementation of capacity building for national and regional government level</li> <li>Implementation of capacity building for representative of beneficiary level</li> <li>To be implemented through proposed pilot projects.</li> </ul>  |
| 3. Niche Markets  | Need diversification of traded products due to low coffee prices   | <ul style="list-style-type: none"> <li>Niche market study</li> </ul>  | USAID/OTI   | January 2002 (preliminary study)                            |  |
| <b>FOOD CROPS</b>   |  |   |   |   |  |
| 1. Rice Policy  | Merits of a rice tariff<br><br>Difficulties in distribution and marketing for domestic rice<br>Rice Distribution Board                                 | <ul style="list-style-type: none"> <li>Delay until more is known about consumer behavior</li> <li>Promote better market links, post harvest, rice varieties</li> <li>Consider lessons learned from other countries</li> </ul> | FAO, World Bank and JICA (complement to analysis of household survey)                             | January 2002  | <ul style="list-style-type: none"> <li>Macro-economy on rice policy is under studied in the Mid-Term Integrated Agricultural Development Plan.</li> <li>Farm household economy will be revised based on the completed household survey.</li> </ul>   |
| 2. Farm Mechanization   | Donations of farm machinery have lacked operation and maintenance support  | <ul style="list-style-type: none"> <li>Pilot project on maintenance of farm machinery</li> <li>MAF to request Chinese government for O&amp;M support</li> </ul>   | JICA<br><br>China   | January 2002?<br><br>As soon as possible                    | <ul style="list-style-type: none"> <li>Training and hiring facility and manpower for farm mechanization</li> <li>Consolidation of repair and maintenance workshop</li> <li>Promotion of animal traction</li> </ul>   |
| 3. Soil Laboratory  | Need for laboratory facilities for soil testing and disease diagnosis  | <ul style="list-style-type: none"> <li>Use shared environmental laboratory facilities at Dili hospital</li> </ul>   | Soil and plant analysis equipment: ARP J<br>Other equipment needs to be considered as they emerge | December 2001   |  |
| <b>CASH CROPS</b>   |  |   |   |   |  |
| 1. Coffee Quality   | Quality of coffee has declined in 2001 threatening international reputation  | <ul style="list-style-type: none"> <li>Invest urgently in measures to improve quality: improved processing, training of farmers</li> </ul>  | On-going USAID, Portugal projects; AusAID Regional Development Project                            | As soon as possible   |  |
| 2. East Timor Organic   | ETO regulation still pending   | <ul style="list-style-type: none"> <li>Given lack of international recognition of ETO and potential impact on farmers, withdraw or substantially revise current regulation</li> </ul>   | Action by MAF<br><br>New Zealand  | As soon as possible   |  |
| 3. Institutional Home for Cash Crops  | Cash crops require urgent institutional and agronomic support  | <ul style="list-style-type: none"> <li>Create Cash Crops Unit within Food Production Division of MAF</li> </ul>   | Action by MAF   | As soon as possible   | <ul style="list-style-type: none"> <li>Strengthening agro-extension activity</li> <li>Subsidization of inputs (seeds, fertilizer, pesticides, etc.)</li> <li>Introduction of micro-finance for water user's association (WUA), agro-cooperative, household processing groups</li> </ul>  |
| <b>IRRIGATION</b>   |  |   |   |   |  |
| 1. Responsibilities for Operation and Maintenance (O&M) of Irrigation Schemes | Responsibilities need to be clearly defined between Government and communities   | <ul style="list-style-type: none"> <li>Conduct water policy study</li> <li>Closely supervise community works</li> </ul>   | ARP II (but may need reallocation of project budget)  | September 2002  |  |
| 2. Water Policy Study   | National water policy study needs to be integrated with broader policies on water use  | <ul style="list-style-type: none"> <li>Conduct water policy study</li> </ul>  | ARP II  | End- 2002   |  |
| 3. Rehabilitation of Major Damaged Schemes                                    | The viability of repairing major damaged schemes needs to be assessed  | <ul style="list-style-type: none"> <li>Conduct feasibility study on rehabilitation of Caraulun Irrigation Scheme</li> </ul>   | TBD   | June 2002   | - Rehabilitation of agricultural infrastructures such as water resources and intake facilities, canal, farm roads, etc.  |
| <b>LIVESTOCK</b>  |  |   |   |   |  |
| 1. Quarantine Regulations   | Quarantine regulations need to be urgently adopted to regulate animal and plant imports and certify exports  | <ul style="list-style-type: none"> <li>Develop national quarantine regulations</li> </ul>   | AQIS  | February 2002   |  |
| 2. Abattoir Policies  | MAF is concerned about standards for meat slaughter, particularly serving Dili market  | <ul style="list-style-type: none"> <li>Local slaughter is difficult to control and regulate</li> <li>Encourage slaughter at district centers and provide training materials</li> </ul>  | FAO   | As soon as possible   |  |
| 3. Village Livestock Workers (VLW)  | A system of VLW needs to be developed to complement livestock assistance by MAF  | <ul style="list-style-type: none"> <li>Develop regulations for standards for VLWs and veterinary supplies</li> <li>Provide periodic training</li> </ul>   | ARP II (TFET)   | March-April 2002  | <ul style="list-style-type: none"> <li>Expansion of veterinary services</li> <li>Intensification of Bali cattle production</li> <li>Integration of food and feed crops in smallholder farms for pigs and poultry</li> <li>Buffalo dairy</li> <li>Increase of goat production</li> <li>Improvement of horse production</li> </ul> |
| <b>FISHERIES</b>  |  |   |   |   |  |
| 1. Negotiations of Maritime Boundary  | East Timor needs to urgently negotiate a fisheries boundary with Indonesia and Australia   | <ul style="list-style-type: none"> <li>Provide assistance of professional negotiator</li> </ul>   | ADB   | Start Dec. 2001 or January 2002                             |  |
| 2. Legislative and Investment Support   | A National Fisheries Law and interim regulations need to be developed urgently   | <ul style="list-style-type: none"> <li>Interim assistance (3 pm)</li> <li>Long-term assistance (1 yr)</li> </ul>  | ADB<br>AusAID   | January 2002<br>March-April 2002                            |  |
| 3. Management of Inshore Fisheries  | Effective management of inshore fisheries is needed in the short to medium-term  | <ul style="list-style-type: none"> <li>Facilitate declaration of by-laws by communities</li> <li>Avoid top-down management plans</li> <li>Complement by ecological and socio-economic studies</li> </ul>                      | AusAID<br><br>Ecological: ARP II<br>Socio-economic: to be identified                              | March-April 2002<br><br>February 2002<br>January 2002       | <ul style="list-style-type: none"> <li>Improvement of fishing vessels</li> <li>Improvement of fishing operation</li> <li>Implementation of landing survey</li> <li>Improvement of fish market</li> <li>Strengthening of fishery administration</li> </ul>  |
| <b>FORESTRY</b>   |  |   |   |   |  |
| 1. Legislative Support  | There is a need to urgently revise the forest strategy and policy and issue interim implementing guidelines<br>A new Forestry Law needs to be prepared | <ul style="list-style-type: none"> <li>Revise Forest Strategy and Policy</li> <li>Expand TOR for forest advisor to include guidelines</li> <li>Prepare National Forest Law</li> </ul>   | ARP II<br><br>ARP II<br><br>EU (under consideration)  | No later than April 2002<br>December 2002<br><br>Early 2003 |  |
| 2. Management of Protected Areas  | The mandates of MAF and EPU need to be clarified<br>Long-term financing for protected areas is needed  | <ul style="list-style-type: none"> <li>Clarify mandates</li> <li>Ratify Biodiversity Convention and apply for enabling GEF funds</li> <li>Invite visit by International conservation NGOs</li> </ul>                          | MAF and EPU<br>EPU and MAF<br><br>MAF and EPU   | As soon as possible   | <ul style="list-style-type: none"> <li>Rehabilitation of critical land by reforestation</li> <li>Development of community forest by greening</li> </ul>  |
| 3. Campaign for Forest Fires  | MAF needs to implement an information campaign on forest fires   | <ul style="list-style-type: none"> <li>Include in TOR of information campaign</li> </ul>  | ARP II  | January 2002  |  |
| 4. Forest Inventory   | MAF needs assistance in completing forestry inventory  | <ul style="list-style-type: none"> <li>Submit request for follow-up assistance</li> </ul>   | AusAID  | As soon as possible   |  |
| <b>GIS</b>  |  |   |   |   |  |
| 1. Ensuring effective use of GIS by MAF                                       | GIS is a key tool for policy development and should be used more effectively   | <ul style="list-style-type: none"> <li>Extend the current GIS project to September 2002</li> </ul>  | AusAID  | January 2002  |  |