ANNEX N. RURAL SOCIOLOGY

CONTENTS

List of Tables

List of Figures

N-1. Introduction

In any development programs, a good understanding of the sociology of the people that shall be benefited and affected by the program is always be necessary. Firstly, there are collective attitudes necessary to be understood to enable the program take off the ground with the participation of the people. Secondly, having understood those - better basis in undertaking measures to ensure that the gains of programs could be locally sustained even after the proponents has left the community.

These are the focus of this Annex. It also included a section on the results of the Village and Household Surveys undertaken in East Timor by a number of collaborating international agencies and institutions. Discussed were the findings of the survey on the social conditions in the country.

N-2. Historical Background /1

2.1 The People and its Ethnicity, Languages and Dialects Spoken

East Timor is a remarkably diverse territory in terms of its environment, demography and ethno linguistic aspects.

Based mainly on factors of altitude and rainfall, East Timor can be divided into six (6) agro-climatic zones – coastal lowland, mountain slope and upland zones in each of the South and North sides of the country. Their coastal lowland and mountain slope zones dominate the Western and Eastern Regions while the upland zones dominate the Central Region. These agro-climatic differences are critical factors in the present pattern of livelihood strategies of the people of East Timor.

East Timor can also be divided into two divisions - imaginary line from North to South along the border of the Manatuto District, each had some cultural salience and one possible starting point for representing lines of potential development difference from the view of social attitude. These divisions are what East Timorese referred to as *Firaku* (eastern East Timor) and *Kaladi* (western East Timor). Members of *Firaku* region represent themselves as more dynamic and more committed to independence for the whole period of the struggle; they see the *Kaladi* as less dynamic and more accommodating during the same period.

Like its environmental diversity, ethno linguistic diversity in Timor is great. All its languages belong to one of the two large language families: Austronesian or Trans-New Guinea Phylum. The main Trans-New Guinea Phylum languages are Bunak, Makassae and Fataluku (or Dagada). The main Austronesian languages are Tetun, Mambai, Uab Meto (Dawan), Galoli, Tokodede and Kemak. Other smaller languages are spoken by fewer of the population. These included Uaima, Kauru-Midiki, Habu, Idate, Naueti, Naumic, Makili, Bikeli and Makdade (all Austronesian). Bunak and Kemak languages tend to dominate the Western Region, Mambai - Central Region and Makassae - Eastern Region.

/1 Substantial portion of this Section is from the 'WB Social Assessment Report – April 2001' and 'Diversity and Differential Development in East Timor: Potential Problems and Future Possibilities. James J. Fox. March 2001.

East Timor could be Malenesian with Asian overlays, or Asians, with Malenesian or Papuan overlays. The origin of the East Timorese people is mixed and this has led to the evolution of distinct belief system. The system had provided the society with stability and resilience that enable them to withstand the subjugating rules of two foreign colonial powers.

The society had a feeling of pride that its has been able to experience many centuries of colonial domination and still emerge with its common values and customs intact. For 500 years, many of the traditional customs and *adat* have been carried out in a climate or furtiveness or secrecy. This hopes to be put into open to enable it to play a more central role in the continuing well being and growth of East Timor.

2.2 Traditional Political and Clan Structures

Prior to the arrival of the colonizers from Europe, the region is dominated by mini-kingdoms headed by powerful leaders, which are referred to as Sultans towards the West of the archipelago, and as *Liurai* in Timor. These leaders are continuous jostling for power and territory with the population boring the cost of these wars. It political structure was hierarchical and feudal in nature (See Figure N-5).

Below the level of the *Liurai* was his extended family – *Dato Wain*, also called *Fettor*, in some localities. The *Liurai* and his family usually owned large tracts of lands and accept tributes from the *Reino* or common people.

The *Makaer Fukun* or judiciary carried out a dual role – upheld the laws that enshrined the *Liurai* and acts as magistrate or judge.

The *Tembukun*, also called Tumegao, carried out several roles – defense of the *Liurai*, serves out as the Town Crier that carries out public announcement, general policing duties, and organize the common people, workers and slaves.

The *Reino* are the common people and paid taxes to the *Liurai*. They are permitted to attend meetings (*tesilia* or sometime termed as *biti-boot* – a traditional pandanus mat, name came to be applied to meetings in a sense of sitting down as a group and talking). They can call meetings at their level. The people at the hierarchy above their levels can also call meetings for their own levels or people below.

Separate from the *Reino* are categories of workers – *Lutun, Cab-leha* or *Tobe*. They carry out farm work, livestock tending and security duties. They can be bonded to all persons qualified to attend the *tesilla* or meeting. They cannot attend meeting but could seek meeting with higher levels up the hierarchy including the *Liurai* on matters concerning their work.

At the bottom of the hierarchy ate the *Atan* or slaves – they work for security, judiciary, aristocracy and *Liurai*.

There is a distinction between the political above described with that of the clan structure. (See Figure N-6) While the *Liurai* political structure provide security for the community and dealt with the most serious crimes, day to day life of the people was controlled by the customs

evolved by their clan, house or extended family. Most common is that *Liurai* controlled several clans.

A clan may be defined as a tribe or a house of lineage – identity is shared through common ancestors. Each clan occupies an area of land, the border of which is recognized by neighboring clans. Each family in the clan has the right of usage of clan land. These rights are handed down usually through the males – a small number of clan lands are handed down through the females. In some clans, all lands is allocated or "owned" by families. In other clans, unused land is retained as common land – which can be allocated to individual families as the need arises. Overtime, each clan has evolved a unique socio-cosmic belief system – one that provides an explanation of the world where each clan lives resulting to a culture manifested by intricate set of customs, ceremonies and laws. These dictate the conduct of daily lives of the people. Although each clan may have a unique socio-cosmic belief and set of customs, there are many similarities.

The clan structure has remained virtually intact in spite of the long years of foreign subjugation. It is because of the fundamental concept common to all of the belief system – the notion of balance. Notion of hot and cold, elder brother and younger brother, inside and outside underpin mythologies and are woven into the interpretation of contemporary and historical events – this sense of balance allowed the clans to adjust to change. The balanced based on the belief system is destroyed as circumstances change such as take over by colonial power. Mythologies are adjusted and ceremonies devised to take into account the changed circumstances – the new balance is corrected and socio-cosmic balance is restored. This to some degree explains the strength of the clans and resilience of the East Timorese society.

The powerhouse of the clan is the *Uma Lulik Boot* – large or senior Sacred House. Attached to the *Uma Lulik Boot* is the senior wise man or elder, the *Makaer Lulik* – keeper of the oral tradition and history of the clan, advises on ceremonies and provides the final say in serious matter of disputes. Objects of value and objects used in ceremonies are stored in the *Uma Lulik Boot*.

Within the territory occupied by the clan there are a number of smaller Sacred Houses – *Uma Lulik Ki'ik* and junior *Maker Lulik* fulfill the same functions on the local level as the big sacred house does at the central level. The *Uma Lulik* services the needs of the ordinary clan members – the *Uma Kain*.

Associated with each *Uma Lulik Ki'ik* is a council of elders or wise men, known in various names as *Mane Bot, Adat Nain* or *Toko Adat*. They have a range of responsibilities including *inter alia*: arranging and leading ceremonies inside and outside of the sacred house and also in households, negotiating *barlaki* (gifts for couples to be married), solving and resolving disputes, establishing *Tara Bandu* (a taboo aimed at protecting natural resources), initiating community works, advising villages on infrastructure (such as roads, water supply and others), and advising on when to plant as well as other agricultural matters. If the *Mane Bot* cannot resolve a dispute, they will call on advice from the *Uma Lulik Ki'ik* and *Makaer Lulik*. And if still a resolution cannot be found, the dispute shall be elevated up to the *Makaer Lulik* in the *Uma Lulik Boot*.

2.3 Colonization

During their period, the Portuguese followed the normal colonial strategy of utilizing the existing leadership to enforce the rule of law. Thus, the *Liurai* were converted from kings to become the agent of the Portuguese government. Also selected by the Portuguese were few *Liurai,* called them as *Dons,* and put them in-charge of other smaller groups of *Liurai.*

The addition of the Dons on top of the traditional political structure that existed prior to their arrival was the only change made by the Portuguese. (See Figure N-7).

During the annexation of East Timor as its 27th Province, the Indonesians introduced elections - a new political system that was intended to place into sideline the traditional political system. There were *Liurai* elected to the village political positions in those times and the people were able to maintain the traditional system through time. Up to the present, this is still the basis of the traditional self-reliance system that still exists in most of rural areas in East Timor. It was even utilized by the clandestine movement to enhance their struggle for independence and had played a very important role in success of the popular consultation, which brought East Timor to where it is now.

2.4 Early Period of Independence

In spite of the long years of colonization and annexation, East Timor has maintained to some degree its traditional social structure in the rural area. The practice, respect and recognition of the *Liurai* and its traditions had persisted.

Despite the long period of colonization and annexation, the structure of the clans and the role of the sacred houses (Uma Lulik), the keeper of the philosophy (Makaer Lulik) and the council of elders (Manc Bot) have not changed to any significant degree. They continue to play an important role in the people's lives – the clan structure and underpinning belief system persisted in part as they are separate from political functions and not directly exposed to governmental influence or actions. It has survived being meaningful to the individual members of the society.

In many villages of East Timor, one could still see the traditional *Uma Lulik* – sacred houses where the clans hold their traditional meetings (*tesilia*) and initiating activities for traditional ceremonies. (See Figure N-8).

N-3. *Demographic and Social Profile*

3.1 Population

Based on the 02 July 2001 Results on Registration of the Civil Registry Unit, the population is 737,811 and the distribution of which are: 20 % in Western Region, 49 % - Central Region, and 31 % - Eastern Region. The population density would be 44 persons per sq km, 79 per sq km and 34 per sq km for Western, Central and Eastern Regions, respectively. (See Table N-1).

The districts with the most number of people are Dili (128,490 or 17.4 % of the total), Baucau (93,368 or 12.7 %), Ermera (84,510 or 11.5 %) and Bobonaro (62,273 or 8.4 %) – for a total of 50 % of the whole population in only 27.2 % of the total land area.

The rest of the population is distributed in the other nine (9) districts with the least population in Manufahi (35,000 or 4.8 %), Manatuto (32,598 or 4.4 %) and Aileu (30,146 or 4.1 %) – for a total of 98,244 or 13.3 % in only 25.8 % of the total land area.

Based on the average population growth rate of 2.56 % during the 1980 to 1996 period, the total population is projected to grow to 874,001 in 2007 with a population density of 60 persons per sq km and to 1,074,375 in 2017 with a density of 74 persons per sq km. Tables N-2 and N-3 showed the population growth rates and projections.

The total number of household was 158,739 in 1992 of which 38,442 in Western Region, 72,448 in Central Region and 47,849 in Eastern Region. The number was 186,745 in 1996 of which 45,276 in Western Region, 89,191 in Central Region and 52,278 in Eastern Region. Based on the average growth rate of 3.28 % annual growth rate, computed from the 1192 to 1996 records, by the end of 2001, the total household number is projected to increase to 214,073 of which 51,654 in Western Region, 107,017 in Central Region and 55,401 in Eastern Region (Table N-4).

Of the total population, 43.9 % is below 14 years old. Of these, 22.5 % are males and 21.4 % are female. Two and a half percent (2.5 %) are 65 years old and above – of which 1.3 % - males and 1.2 % - females. The total percentage of these age groups is 46.4 % - portion of the population that is considered as dependent. The rest, 53.6 %, are considered under the main working group. Based on these figures, the dependency ratio of the population of East Timor is 86.6 %. Dependency ratio is the comparison of the total of the children (below 14 years old) and elderly people (above 64 years old) with the number of people in the working ages – considered to be between 15 to 64 years old.

The distribution of the population by age group and by sex is shown in Figures N-3 and N-4.

3.2 Health and Education

According to the report on *Social and Economic Condition in East Timor*, the general rate of malnutrition (weight/age) in the country was high at 38 % of children aged 12-59 months or below five years old.

The same report also indicated that the education sector in East Timor is large but ineffective. There is lack of teachers since the secondary and tertiary teachers were from Indonesia and have left East Timor. In addition to recruiting new teachers, improving quality of teachers is necessary.

The level of human capital as measured by educational attainment of the population living in East Timor is low. In 1998, of the working age population (10 years and above) who were not attending school, almost 60 % had never attended school. There are also large

geographical differences. In Dili, 70 % attended school compared to 20 % in Ermera and Ainaro.

N-4. Village and Household Survey: Social Condition

The details of the village and household surveys are shown in Tables N-5 and N-6, respectively. Presented below are the summaries of these two surveys on the social conditions in rural East Timor.

4.1 Village Survey

The results of the village survey showed that a typical village in East Timor has average of 489 households with a range of 44 to 2,184 households per village.

Only 59 percent of all the roads are asphalt while the rest are gravel and earth. The road conditions are rated 35 percent fair to good and 64 percent seasonally poor to poor. Only 18 percent of the household have electricity and 25 percent has access to piped-in drinking water. The main source of water is spring (63 percent).

Main sources of finance in the villages are the middleman or traders. There are no banks or cooperatives. Generally, agricultural extension service in the rural area is poor, average visit is once a year with a maximum of six while 54 % of the respondents was not even visited. Lubricant oil, fuel and kerosene supplies are available from 17, 22 and 53 percent of the villages, respectively, and at varying prices.

Land ownership in East Timor are as follows: individual land ownership at 51.5 percent is the largest category and others in descending order are: public land 33.5 percent, 12.4 percent - others, corporate land -1.9 percent and community-clan owned lands - 0.7 percent.

Seventy-six (76) percent have irrigation and 49 percent of them are sharing it with another village. The average area irrigated is 148 hectares and the irrigation systems are mostly simple with 2.6-km primary canal and serving about 83 households. Mostly individual farmers (48 percent) do maintenance, 10 percent by Water Users' Associations while 38 percent are not maintained at all.

Most village plant mixed crops. Coffee is the biggest planted area followed by maize and rice with coconut, cassava, kidney beans, mung beans and others in descending order. The biggest livestock population in a typical village is native chicken followed in descending order by pigs, cattle, goat, buffalo, sheep, horses and ducks.

Only 6 percent of the villages do not have adequate supply of wood for cooking and most (78 percent) are taken from nearby forest areas. Fourteen (14) percent of the villages plant trees for wood for cooking and in which the average planted area was 6.9 hectares. Seventy-five (75) percent of the villages has minor to serious erosion problems in their catchment areas and only 40 percent of them are taking one or more measures at their own initiatives to reduce them. About 52 percent of the villages do animal hunting and about 75 percent are hunting for wild pigs and deer. The biggest users of forest product is for fuel wood followed by bamboo, candle nut, and timber wood. About 79 percent gather plants for medicinal purposes but 58 percent of

them grow medicinal plants.

Fishermen are found in 31 of the 106 villages surveyed with 22 having both full and part time fishermen. Most of the fishing vessels are canoes, 22 villages with non-powered canoes and 4 with powered canoes. Fifty-tw0 (52) percent fish at night while 39 percent in the morning and the rest in mid-day and afternoon. Best month for fishing was from August to November (10, 14, 15 and 10 percent, respectively) and worst for the remaining period of the year.

All farmers have provisions for storage as most of them store portions of their harvest in their homes. Only 15 percent have storage separate from their homes but in separate building next to their homes. Only 35 villages reported having rice mills, 147 with drying facilities (mostly mat dryers and few private concrete pavements), 13 villages with 138 coffee milling facilities and 7 villages with 8 maize mills.

Organizations of people in rural East Timor do exist. These are organizations of farmers, water users (both irrigation and drinking water), livestock growers, fishermen and traders.

4.2 Household Survey

The preliminary results herein discussed were from 128 households which is 7 percent of 1,800 household planned for the household survey.

An average farm household in East Timor has 1.2 hectare farm lot and on the average 58 percent is planted to annual crops, 37 percent to plantation crops and the rest to other uses. In any of these cases, the farm lot is planted 73 percent most of the time. Most of the farm lots are privately owned and 69 percent, acquired in through inheritance and nature of ownership is customary right (62 percent) and on the average have been with the owner for 16 years. Very few (1 percent) have disputes over land ownership. The average value of farm lot is about Rp 31.4 million per ha.

Most of the household farm lots have slight to moderate slope (71 percent) and without irrigation (69 percent). Irrigated areas are mostly through direct river sources (50 percent), canals or ditch (30 percent) and springs (20 percent). Farmers groups (50 percent), self-managed (40 percent) and community-managed (10 percent) manage most irrigation.

Average distance of the farm from the road is 1.5 km and the crops grown are maize, coffee, rice, sweet potato and vegetables. The average yields were 1,688 kg/ha for paddy rice, 999 kg/ha for corn and 1,688 kg/ha. Table N-6 showed the yields as well as the consumption for other crops. Most of the purchases for farm inputs are limited to purchase of seeds especially for maize and beans. Few purchases were usually made for fertilizers and insecticides. Most reason cited for the low purchase for fertilizers were it is not available or required.

Ninety-three (93) percent uses wood for cooking and the most common source are the forests adjacent to the villages. Only 2 percent plant trees for their supply of woods for cooking planting about 10 trees in 3 years. Very few hunts wild animals and gather plants for medicinal purposes.

The most common farm implement an average household has hoes axes, shovels, picks, large knives and reaping hooks. Only 3 percent own or rent any mechanized farm equipment.

Eighty-two (82) percent of household reported owning livestock. The most common are chickens, pigs, cattle and buffalo.

Table N-1. General Information - East Timor

Region/District	Population [1]				Elevation(mamsl) - Area (sq km) [2]			Total
	Number	%	No./sq km	Growth (%)	0-100	101-500	> 500	
Nationwide	***737,811***	***100.0***	***51***	***2.56***	***3,136.99***	***6,416.04***	***5,055.76***	***14,608.79***
					21.47	***43.92***	***34.61***	***100.00***
Western Region	*149,296*	*20.2*	*44*	*2.32*	*817.99*	*1,534.00*	*1,056.33*	*3,408.32*
					5.60	*10.50*	*7.23*	*23.33*
Oecussi	44,517	6.0	55	2.32	195.00	394.54	225.12	814.66
					1.33	2.70	1.54	5.58
Cova Lima	42,506	5.8	35	2.79	401.00	481.33	343.21	1,225.54
					2.74	3.29	2.35	8.39
Bobonaro	62,273	8.4	46	2.30	221.99	658.13	488.00	1,368.12
					1.52	4.51	3.34	9.37
Central Region	*359,021*	*48.7*	*79*	*3.64*	*766.00*	*1,358.99*	*2,393.41*	*4,518.40*
					5.24	*9.30*	*16.38*	*30.93*
Ainaro	36,969	5.0	46	1.21	80.00	235.35	483.52	798.87
					0.55	1.61	3.31	5.47
Ermera	84,510	11.5	113	2.77	23.00	137.58	585.42	746.00
					0.16	0.94	4.01	5.11
Liquica	43,406	5.9	79	3.65	131.00	199.12	218.00	548.12
					0.90	1.36	1.49	3.75
Aileu	30,146	4.1	41	4.46	-	51.00	678.49	729.49
					-	0.35	4.64	4.99
Manufahi	35,500	4.8	27	2.03	296.00	620.94	407.98	1,324.92
					2.03	4.25	2.79	9.07
Dili	128,490	17.4	346	5.91	236.00	115.00	20.00	371.00
					1.62	0.79	0.14	2.54
Eastern Region	*229,494*	*31.1*	*34*	*1.22*	*1,553.00*	*3,523.05*	*1,606.02*	*6,682.07*
					10.63	*24.12*	*10.99*	*45.74*
Manatuto	32,598	4.4	19	2.18	325.00	758.95	621.50	1,705.45
					2.22	5.20	4.25	11.67
Baucau	93,368	12.7	63	1.14	258.00	810.28	425.52	1,493.80
					1.77	5.55	2.91	10.23
Viqueque	54,315	7.4	31	0.32	603.00	764.50	413.00	1,780.50
					4.13	5.23	2.83	12.19
Lautem	49,213	6.7	29	1.96	367.00	1,189.32	146.00	1,702.32
					2.51	8.14	1.00	11.65

Source:

[1] Civil Registry Unit - 02 July 2001

[2] 1997 East Timor in Figures

Table N-2. Population Records - East Timor

Region/Districts	*1980 /1*	*1990 /1*	*1992 /1*	*1993 /2*	*1994 /2*	*1995 /2*
Nationwide	*555,350*	*747,737*	*796,317*	*811,637*	*827,727*	*842,696*
Western Region	*131,778*	*175,981*	*186,515*	*189,765*	*193,143*	*196,259*
Oecussi	37,110	48,979	51,776	52,636	53,529	54,351
Cova Lima	32,688	45,310	48,402	49,364	50,366	51,294
Bobonaro	61,980	81,692	86,337	87,765	89,248	90,614
Central Region	*231,579*	*347,607*	*378,744*	*388,748*	*399,338*	*409,255*
Ainaro	37,167	43,375	44,674	45,060	45,455	45,812
Ermera	56,081	77,570	82,831	84,466	86,170	87,747
Liquica	29,342	44,425	48,116	49,338	50,621	51,818
Aileu	15,162	24,657	27,248	28,078	28,953	29,775
Manufahi	26,788	34,275	36,000	36,527	37,072	37,573
Dili	67,039	123,305	139,875	145,279	151,067	156,530
Eastern Region	*191,993*	*224,149*	*231,058*	*233,124*	*235,246*	*237,182*
Manatuto	24,442	31,805	33,523	34,049	34,595	35,098
Bacau	74,827	86,675	89,124	89,847	90,587	91,257
Viqueque	54,625	57,279	57,670	57,770	57,866	57,948
Lautem	38,099	48,390	50,741	51,458	52,198	52,879

Region/Districts	1996 /2	1997 /2	1998 /3	1999 /3	2000 /3	2001 /4
Nationwide	*857,018*	*881,600*	*887,686*	*695,325*	*753,189*	*737,811*
Western Region	*199,220*	*209,700*	*205,061*	*132,096*	*159,408*	*149,296*
Oecussi	55,132	55,400	57,289	40,378	43,225	44,517
Cova Lima	52,178	63,000	60,839	40,062	48,746	42,506
Bobonaro	91,910	91,300	86,933	51,656	67,437	62,273
Central Region	*418,795*	*428,600*	*432,286*	*345,188*	*375,056*	*359,021*
Ainaro	46,148	43,400	51,082	38,142	49,034	36,969
Ermera	89,249	88,300	90,795	73,394	75,692	84,510
Liquica	52,964	52,500	55,580	21,934	38,603	43,406
Aileu	30,556	31,900	34,922	32,225	32,225	30,146
Manufahi	38,047	38,300	43,419	40,716	40,725	35,500
Dili	161,831	174,200	156,488	138,777	138,777	128,490
Eastern Region	*239,003*	*243,300*	*250,339*	*218,041*	*218,725*	*229,494*
Manatuto	35,574	35,200	39,674	36,365	36,557	32,598
Baucau	91,885	96,800	93,551	63,501	63,501	93,368
Viqueque	58,021	59,400	64,627	64,907	64,907	54,315
Lautem	53,523	51,900	52,487	53,268	53,760	49,213

SOURCES:

/1 *The East Timor Project - Volume I*

/2 East Timor in Figures 1997

/3 Special Report - FAO/WFP Crop and Food Supply Assessment Mission to East Timor 19 April 2000.
Records are in 1998, November 1999 and February 2000

/4 *Civil Registry in East Timor - Result - 02 July 2001*

Table N-3. Population Growth Rate and Density in 2001

Region/District	1997 Population	Growth Rate /a	2001 /b	
			Number	Density /c
Nationwide	881,600	2.56	*737,811*	*51*
Western Region	209,700	*2.43*	*149,296*	*44*
Oecussi	55,400	2.32	44,517	55
Cova Lima	63,000	2.79	42,506	35
Bobonaro	91,300	2.30	62,273	46
Central Region	428,600	*3.64*	*359,021*	*79*
Ainaro	43,400	1.21	36,969	46
Ermera	88,300	2.77	84,510	113
Liquica	52,500	3.65	43,406	79
Aileu	31,900	4.46	30,146	41
Manufahi	38,300	2.03	35,500	27
Dili	174,200	5.91	128,490	346
Eastern Region	243,300	*1.22*	*229,494*	*34*
Manatuto	35,200	2.18	32,598	19
Bacau	96,800	1.14	93,368	63
Viqueque	59,400	0.32	54,315	31
Lautem	51,900	1.96	49,213	29

/a Average growth rate of 1980 to 1998 Population Records
/b Civil Registry Results: 2 July 2001, CRU-UNTAET
c/ Computed using the area presented in Table N-1

Table N-4. Household Record and Projections

Region/District	1992 /a	1993 /a	1994 /a	1995 /a	1996 /a
Nationwide	*158,739*	*163,528*	*169,454*	*175,496*	*180,639*
Western Region	*38,442*	*39,631*	*41,090*	*42,568*	*43,794*
Oecussi	10,929	11,163	11,446	11,725	11,952
Cova Lima	10,423	10,888	11,467	12,064	12,568
Bobonaro	17,090	17,580	18,177	18,779	19,274
Central Region	*72,448*	*75,419*	*79,129*	*82,994*	*86,276*
Ainaro	8,187	8,332	8,506	8,676	8,813
Ermera	17,309	17,838	18,484	19,137	19,676
Liquica	9,649	9,966	10,356	10,751	11,078
Aileu	4,949	5,031	5,128	5,224	5,300
Manufahi	6,340	6,479	6,645	6,811	6,945
Dili	26,014	27,773	30,010	32,395	34,464
Eastern Region	*47,849*	*48,478*	*49,235*	*49,934*	*50,569*
Manatuto	7,204	7,491	7,846	8,211	8,516
Bacau	18,185	18,281	18,392	18,448	18,560
Viqueque	11,920	12,008	12,110	12,204	12,276
Lautem	10,540	10,698	10,887	11,071	11,217

Region/District	1997 /a	1998 /b	1999 /b	2000 /b	2001 /b
Nationwide	*186,745*	*193,096*	*199,756*	*206,741*	*214,073*
Western Region	*45,276*	*46,786*	*48,351*	*49,973*	*51,654*
Oecussi	12,358	12,638	12,924	13,216	13,515
Cova Lima	12,993	13,615	14,268	14,951	15,668
Bobonaro	19,925	20,533	21,160	21,806	22,472
Central Region	*89,191*	*93,282*	*97,606*	*102,179*	*107,017*
Ainaro	9,111	9,280	9,453	9,629	9,808
Ermera	20,341	21,003	21,687	22,394	23,123
Liquica	11,452	11,854	12,271	12,702	13,148
Aileu	5,479	5,574	5,670	5,768	5,868
Manufahi	7,180	7,346	7,515	7,688	7,865
Dili	35,628	38,224	41,010	43,999	47,205
Eastern Region	*52,278*	*53,028*	*53,798*	*54,589*	*55,401*
Manatuto	8,804	9,180	9,572	9,981	10,408
Bacau	19,187	19,285	19,384	19,483	19,583
Viqueque	12,691	12,785	12,879	12,974	13,070
Lautem	11,596	11,778	11,963	12,150	12,341

/a Based on 1997 East Timor in Figures
/b Computed Using the Average Growth Rate of 1992 to 1997 Record

Table N-5. Results of Village Survey

These results are based on a representative cross section of 106 villages (i.e., sucos) located throughout Timor Lorosa'e.

1. General Information

1.1 Households Per Village

1.	Average Number of Households Per Village:	489
2.	Largest Number of Households Per Village:	2,184
3.	Least Number of Households Per Village:	44
4.	25% of Villages had:	248 Households or less
5.	25% of Villages had:	623 Households or more

1.2 Type of Main Village Road By Percent:

1.	No Road	2%
2.	Asphalt	59%
3.	Gravel	19%
4.	Earth	20%

1.3 Condition of Main Village Road By Percent:

1.	There is No Road	1%
2.	Poor	20%
3.	Moderately Broken	20%
4.	Seasonally Poor	24%
5.	Fair	17%
6.	Good	18%

1.4 Length of Main Village Road Requiring Repairs

1.	Average Length Requiring Repairs:	9.2	km
2.	Longest Length Requiring Repairs:	49.0	km
3.	25% of Villages Required Repairs for:	3.3	km or Less
4.	25% of Villages Required Repairs for:	12.0	km or More

1.5 Percent of Households that Have Electricity: 18%

1.6 Percent of Households that Have Piped-in Drinking Water? 25%

1.7 Main Type of Water Sources by Percent:

1.	River	15%
2.	Spring	63%
3.	Pond/Lake	0%
4.	Well	16%
5.	Pump	5%
6.	Other	1%

1.8 What Financing Sources for People Are in the Village By Percent:

None	38%
Commercial Bank	0%
Cooperative	0%
Middleman/Trader	48%
Other	14%

1.9 At Present, How Many Times Per Year Do Agriculture Extension Workers Visit This Village?

1. Average Total Number of Times Per Year: Once
2. Maximum Number of Times Visited Per Year: Six
3. Percent Not Receiving Any Visits Per Year: 54%

1.10 Infrastructure Requiring Improvement in Order of Priority:

1. Irrigation Systems
2. Drinking Water
3. Schools
4. Farm to Market and Other Roads
5. Power
6. Health Clinic/Hospital
7. Marketing Facilities
8. Telephone System

There were recorded a significant number of other infrastructure requiring improvement. However, these items were not amongst the 7 categories listed above. If needed, these items can be referenced on the original data collection sheets.

1.11 Product Markets:

1. Average Distance from a Village Center to a General Market: 3.4 km
2. 25% of the Village Had to Travel More Than: 5.0 km to a General Market
3. Maximum Travel to a General Market: 25 km

Data is available on the original data sheets listing the actual name of the General Market and also nearest Fish Markets.

1.12 Fuel Prices:

1. Diesel:
   - Sold In: 20% of Villages
   - Average Cost: Rp 4,857/Liter
   - Price Range:
     - Maximum Rp 6,000/Liter
     - Minimum Rp 3,500/Liter

2. Gasoline:
   - Sold In: 22% of Villages
   - Average Cost: Rp 5,587/Liter
   - Price Range:
     - Maximum Rp 7,000/Liter
     - Minimum Rp 4,500/Liter

3. Kerosene:
   - Sold In: 53% of Villages
   - Average Cost: Rp 4,964/Liter
   - Price Range:
     - Maximum Rp 9,000/Liter
     - Minimum Rp 3,000/Liter

4. Lubricant Oil:
   - Sold In: 17% of Villages
   - Average Cost: Rp 27,222/Liter
   - Price Range:
     - Maximum Rp 35,000/Liter
     - Minimum Rp 20,000/Liter

2. Land Use and Tenure

National Average Displayed as a Single Village (106 Villages)

Land Use	Public Land (ha)	Community Land (ha)	Clan Owner-ship (ha)	Individual Owner-ship (ha)	Corporate Owner-ship (ha)	Other (ha)
1. Irrigated Field						
1.1 Use 1 Season	52	2	2	218	0	1
1.2 Use 2/3 Seasons	38	2	2	63	0	0
2. Rain Fed Paddy	0	0	0	42	0	0
3. Garden	28	1	0	713	0	7
4. Plantation	3	0	0	384	65	1
5. Dry Field	130	0	0	139	0	72
6. Bush/Underbrush	239	7	0	9	0	5
7. Grass/Unused	501	0	0	14	0	11
8. Forest	557	13	0	5	3	11
9. Swamp	3	0	0	1	0	1
10. Housing/Urban	16	5	2	228	0	5
11. Other: (Mostly Steeply Sloped)	167	0	0	0	0	340
12. Total Village	1,734	30	6	1,816	68	454

3. Irrigation Systems

1.	Percent of Villages Reporting Some Form of Irrigation:	76%
2.	Percent of Villages Sharing System With Another Village:	49%
3.	Average Maximum Irrigated Ha/Irrigation System:	148 Ha
4.	Percent Where Irrigation System Does Not Function:	20%
5.	Type of Irrigation System By Percent (Preliminary)	
	A. Technical	12%
	B. Half Technical	9%
	C. Simple	89%
	D.	
6.	Average Length of Primary Canal (km):	2.6 km
7.	25% of Systems Have Primary Canals Greater Than:	3.0 km
8.	Average Number of Households Benefiting Per System:	83
9.	Percent of Systems with a Water Users Association:	56%
10.	Irrigation System Maintenance in the Last 12 Months By:	
	A. No Maintenance	38%
	B. Government	1%
	C. Water Users Association	10%
	D. Individual Farmers	48%

E. Other (e.g., WB, CEP) 3%

Irrigation systems vary significantly in size from a maximum irrigated area of over 9,500 ha to a minimum size of 1 ha. Names and locations of the various irrigation systems are available in the data set.

4. Agricultural Production of a Typical Village

Agricultural Crop	1997			2000		
	Area Under Cultivation (ha)	Harvest Area (ha)	Production Amount (kg/ha) a)	Area Under Cultivation (ha)	Harvest Area (ha)	Production Amount (kg/ha) a)
1. Rice-Upland	14	14	1,715	16	15	1,669
2. Rice-Rain Fed	32	21	1,778	28	17	1,717
3. Rice-50% Irgtd	100	94	1,733	96	87	1,539
4. Rice-Fully Irgtd	137	126	2,850	116	96	2,618
5. Mung Bean	12	11	1,157	10	10	1,041
6. Maize	159	157	990	147	145	946
7. Cassava	22	22	3,614	19	18	3,509
8. Kidney Bean	28	27	1,282	26	26	1,208
9. Potato	11	11	4,375	10	10	4,446
10. Sweet Potato	11	10	2,898	9	9	3,020
11. Tuber (Yam)	3	3	1,500	3	3	1,500
12. Squash	1	1	2,083	1	1	2,083
13. Peanuts	29	22	1,124	25	19	1,103
14. Coffee	205	201	1,061	206	201	1,058
15. Tobacco	2	2	281	2	1	272
16. Coconuts	59	50	2,821	60	45	2,519
17. Other	18	17	NA	18	16	NA

a) *Inconsistent data was removed by the Team when calculating production amount (kg/ha).*

The source data includes detailed information on where local produce is sold.

5. **Livestock Per Typical Village**

Livestock	Number of Animals In 1997	Number of Animals In Dec. 2000	Percent Decline
1. Cattle	626	235	-62%
2. Buffalo	305	202	-34%
3. Horses	145	97	-33%
4. Goats	436	136	-69%
5. Sheep	284	285	+0%
6. Pigs	1,144	658	-43%
7. Chicken-Native	2,126	1,544	-27%
8. Chicken-Commercial	74	5	-94%
9. Ducks	57	36	-37%

6. **Forestry**

6.1 *Percent of Villages Without Adequate Sources of Wood for Cooking:* 6%

6.2 Of the Villages Where There is Inadequate Wood for Cooking:

78% Get Cooking Wood from Forest Areas in an Adjacent Village
11% Buy from a Store that Sells Wood
11% Buy from Traders that Sells Wood

6.3 In 14% of Villages There People Who Are Planting Trees, Which Can Be Used To Supply Wood for Cooking in the Future.

6.4 In the Villages Which Plant Trees for Cooking Wood The Average Area Planted in the Last 3 Years is 6.9 Hectares.

6.5 Condition of the Land in the Catchment Area of the Stream/River Which Flows Through The Village By Percent:

A. No Erosion Problems 25%
B. Minor Erosion Problems 39%
C. Major Erosion Problems 36%

6.6 Measures the People in the Village Are Taking to Reduce the Extent of Erosion or Rate of Soil Loss By Percent:

1. Not Taking Any Action 60%
2. Planting Trees 25%
3. Making Ponds to Control Run-off 9%
4. Reducing the Area of Cultivated or Bare Land 0%
5. Increasing the Area of Permanent Crops 0%
6. Growing Cover Trees to Protect Cultivated Land 6%

Sum is greater than 100% since some villages take more than 1 action.

6.7 Erosion Control Measures Are Undertaken By

1. No Erosion Control Measures are Being Carried Out 60%
2. People's Own Initiative 38%
3. Farmers Groups 1%
4. Encouraged and/or Assisted by NGO's (Including the Church) 1%
5. On Advice and Guidance from the DAO/PPL 0%

6.8 In 52% of Villages People Hunt for Animals in the Forest.

6.9 Animals Are Hunted Are:

A. Wild Pigs 39%
B. Deer 37%
C. Other Large Animals 4%
D. Birds 17%
E. Other 3%

6.10 Forest Production

Items	No of Villages Reporting Production (of 106 Total)	Production or Reporting Village
1. Timber Wood	49	180 cu m/year
2. Fuel Wood	91	62,903 bunch/year *
3. Honey	19	468 liter/year
4. Rattan	14	12,585 piece/year **
5. Bamboo	82	10,415 piece/year
6. Candle Nut (Kemiri)	50	9,768 kg/year

* : Bunch (Fuel Wood) = approx. 0.04 cu m

** : Piece (Rattan) = 1.85 m

6.11 79% Of People Gather Plants from the Forest for Medicinal Purposes.

6.12 58% Of People Grow Plants for Medicinal Purposes.

7. Fisheries

7.1 General

7.1.1 Of 106 Villages, 31 Villages Reported Having Fishers, 22 Villages Had Both Full and Part Time Fishers, 7 Had Full Time Fishers Only and 2 Part Time Fishers Only. 42% are Full Time Fishers and 58% Part Time Fishers

The Average Number of Fishers in the Reporting Villages was

A. Full-Time Fishers/Village 30
B. Part-Time Fishers/Village 42

7.1.2 Average Number of Vessels Per Reporting Village:

A. Non-Powered Skiffs/Canoes	22
B. Powered Skiffs/Canoes	4
C. Non-Powered Larger Boats	0
D. Powered Larger Boats	0

7.1.3 Fishing Time and Season

7.1.3.1 Best Time for Fishing by Percent:

A. Morning	39%
B. Mid Day	6%
C. Afternoon	3%
D. Evening	52%

7.1.3.2 Worst Time for Fishing By Percent:

A. Morning	0%
B. Mid Day	81%
C. Afternoon	6%
D. Evening	13%

7.1.3.3 Best Months for Fishing By Percent

Jan	4%	Feb	5%	Mar	7%	Apr	7%
May	5%	June	8%	July	8%	Aug	10%
Sept	14%	Oct	15%	Nov	10%	Dec	6%

7.1.3.4 Worst Months for Fishing By Percent

Jan	12%	Feb	14%	Mar	11%	Apr	11%
May	8%	June	6%	July	10%	Aug	10%
Sept	2%	Oct	3%	Nov	4%	Dec	9%

7.1.4 Bad Weather

Month(s) Mostly Not Capable of Fishing Due to Bad Weather Conditions:

Jan	13%	Feb	14%	Mar	7%	Apr	7%
May	6%	June	8%	July	11%	Aug	11%
Sept	3%	Oct	6%	Nov	3%	Dec	11%

7.2 Village Fisheries Facilities

A. 4 Villages Reported Having Jetties In Good Condition. Lengths Were One of 5 Two of 50 m and one of 80 m.
B. No Villages Had Fuel Stations For Servicing Vessels.
C. 1 Village Reported A 72 sq m Building In Good Condition for Fish Handling.
D. 1 Village Reported A 45 sq m Building In Good Condition for Net Loft/ Storage.
E. No Villages Had Fuel Stations For Vessels, Cold Storages or Ice Plants.
F. 4 Villages Had Brackishwater Ponds. One of 4,000 sq m in Poor Condition, One of 10,000 sq m In Fair Condition, and Two In Good Condition (One of 5,000 sq m; One of 250 sq m).
G. 7 Villages Had Freshwater Ponds, 6 of Which Were in Good Condition and 1 in Fair Condition. Pond Sizes Were 10,000 sq m in Fair Condition; and 6,000; 775; 250; 224; 36; and 10 sq m in Good Condition.

7.3 Outboard Motor Related:

A. 5 Villages Sold Fuel at the Landing Area at an Average Price of Rp 4,900 per Liter.
B. 2 Villages Sold Lubricant Oil At an Average Price of Rp 32,500/Liter.
C. 1Village Sold Outboard Gasoline Mixed with Lubricant Oil at the Landing Area at A Price of Rp 6,500/Liter.

7.4 Of 31 Villages, Eight Had Outboard Motor Repair Facilities. 2 Villages Went To Nearby Sucos For Repairs. All Other Villages Had To Go To Dili for Outboard Motor Repairs.

7.5 Traditional Fishing Rules

A. 52% of Villages Had a Local Leader Selected in Charge of Fisheries.
B. Traditional Rules Used by the Community to Control Fishing Are:

1. There are No Traditional Rules	46%
2. Arbitration of Troubles	0%
3. Control of Fishing Seasons	13%
4. Control of Fishing Grounds	6%
5. Control of Fishing Hours	6%
6. Control of Fishing Gear	29%

7.6 Fish Prices

A. Average Fish price at the Landing Site:	Rp 9,452/kg
B. Average Fish price at the Market:	Rp 16,534/kg

The source data includes detailed information on types of fish caught and the markets where fish are sold.

8. Village Agricultural Storage

All Farmers Store At Least Some of Their Harvest In Their Homes.
Of Farmers Storing Outside the Home, Storage Location Is:

A. In a Separate Building Next to the Home	15%
B. Public Facilities	0%
C. Other	3%

9. Village Processing Facilities

Infrastructure	Total Sucos/ Units	Condition	Description
1. Rice Mills	35/ 69	Good 83% Fair 14% Poor 3%	Average/Total Capacity 449 kg/day
2. Drying Facilities 2.1. Net Mat Dryers	71/ 12,617	Good 77% Fair 21% Poor 2%	Average Total Area 18 sq m
2.2. Public Concrete Pavement Dryer	9/ 520	Good 78% Fair 22%	Average Total Area 47 sq m
2.3. Private Concrete Pavement Dryers	41/ 6,471	Good 71% Fair 29%	Average Total Area 19 sq m
2.4. Mechanical Dryers	0	Does Not Apply	Does Not Apply
2.5. Flue Curing Barns	1	Poor Condition	Total Area 1,000 sq m
2.6. Drying Platforms	25/ 3,972	Good 84% Fair 12% Poor 4%	Average Total Area 7 sq m
3. Vegetable Processing Facilities	0	Does Not Apply	Does Not Apply
4. Fruit Processing Facilities	0	Does Not Apply	Does Not Apply
5. Fish Processing Facilities	0	Does Not Apply	Does Not Apply
6. Coffee Milling Facilities	13/ 138	Good 54% Fair 46%	Average Capacity 743 kg/day
7. Maize Milling Facilities	7/ 8	Good 100%	Average Capacity 263 kg/day

10. Presence of Organizations

Kind of Organization	Number of Sucos/ Groups	Average Number of Members Per Group	Activity : 1. Loan/Credit 2. Input Purchases 3. Group Production Activities 4. Products Marketing 5. Other
1. Farmers' Association	51/ 540	12	2, 3, 4, 5
2. Water Users' Association (Irrigation)	13/ 106	14	2, 3, 4, 5
3. Drinking Water Association	2/ 16	8	5
4. Livestock Organization	12/ 70	5	3, 4, 5
5. Forestry Organization	0	0	Does Not Apply
6. Fishermen's Group	24/ 164	8	1, 2, 3, 4, 5
7. Traders' Organization	9/ 40	7	1, 2, 3, 4, 5

Table N-6. Results of Household Survey

These preliminary results are based on a survey size of 128 households. The entire survey when finished is expected to cover approximately 1,800 households. Thus, at the time of field mission only about 7% of the sampling had been completed. Seventy-seven households, equivalent to 60% of those sampled, were engaged in agriculture. The Team anticipates receiving approximately 60% of the survey results by 6 November. The Team's final report will include these results, which represent a statistically valid sample size. Final survey results are expected in late December 2001. It is recommended that approximately 2 months of the economist's time be included in Phase II to allow for compilation of these valuable results and to allow for training of DAA staff in their use.

1. Food Crops

1. The average plot area was:	1.2 ha
2. Plots can be characterized as:	
a. Annual crops	58%
b. Tree crops	1%
c. Forest	1%
d. Pasture	0%
e. Plantation	37%
f. Bush/Underbrush	0%
g. Grassland	1%
h. Swamp	0%
i. Field	0%
j. Water surface	0%
k. House/Building	0%
l. Other	2%
3. Cropped portion of the plot:	
a. None	5%
b. 1-25%	2%
c. 26-50%	10%
d. 50-75%	10%
e. Entire	73%

4. Why the entire plot was not cropped:
   a. Crop rotation 10%
   b. Lack of inputs 5%
   c. Lack of manpower 51%
   d. Lack of equipment 3%
   e. Lack of animal power 8%
   f. No water source 8%
   g. No road 0%
   h. Soil problems 5%
   i. Other 10%

5. What is the tenure status of the plot:
   a. Owner 92%
   b. Part owner 1%
   c. Rented from someone 1%
   d. Rented to someone 0%
   e. Public land 2%
   f. Private land 0%
   g. Other 4%

6. How was this plot acquired:
   a. Inherited 69%
   b. Opened 3%
   c. Purchased 4%
   d. Use right given
   e. by local leader 6%
   f. Occupied 18%

7. What title exists for this plot:
   a. Deed 15%
   b. Sales receipt 1%
   c. Customary right 62%
   d. Other 22%

8. Average number of years this plot has been held: 15.7 years
9. Less than 1% of households have disputes over plot ownership.
10. Average plot value (Rp/ha): Rp 31.4 million
11. Slope of the plot:
   a. Flat 22%
   b. Slight Slope 35%
   c. Moderate slope 36%
   d. Steep slope 7%

12. Irrigation type:

a. Simple Farmer	9%
b. Moderate (Stengah teknis)	22%
c. Modern (Teknis)	0%
d. No irrigation	69%

13. Irrigation mode:

a. Tubewell	0%
b. Ditch/Canal	30%
c. Pond/Tank	0%
d. River	50%
e. Spring	20%
f. Mixed	0%

14. Irrigation management:

a. Self-managed	40%
b. Farmer groups	50%
c. Government	0%
d. Community managed	10%

15. Average distance from a road: 1.5 km

16. The main crops grown were:

(1) Maize; (2) coffee; (3) rice; (4) sweet potato, squash, coconut, vegetables

17. Average Area and Yields Per Household

Crop	Area (ha)	Yield (kg/ha)
Gogo Rice	1.0	800
Rice	1.5	1,688
Maize	0.9	999
Casssava	0.7	1,393
Coffee (Cherries)	1.3	827
Coffee (Dry Beans)	2.1	385
Kidney Bean	0.4	348
Sweet Potato	0.5	620
Potato	0.2	1,000
Taro (Talas/Kontas)	0.7	595
Squash	0.5	880
Mung Bean	1.0	875
Soy Bean	0.5	87
Coconut	0.2	1,666
Peanut	0.2	1,000
Vegetables	0.8	443
Banana	0.5	561
Other Fruit	0.3	953

18. Production Utilization

Crop	Percent				
	Sold	Bartered	Lost	Payment	Consume
Gogo Rice	No Data	No Data	No Data	No Data	No Data
Rice	21	1	6	4	69
Maize	8	2	7	3	80
Casssava	19	2	4	2	73
Coffee (Cherries)	76	3	4	1	16
Coffee (Dry Beans)	79	3	3	1	14
Kidney Bean	44	4	4	0	48
Sweet Potato	11	2	5	2	80
Potato	15	1	6	0	78
Taro (Talas/Kontas)	6	2	4	2	86
Squash	22	3	5	0	70
Mung Bean	0	0	2	0	98
Soy Bean	11	2	6	2	79
Coconut	19	0	0	0	81
Peanut	31	0	11	0	58
Vegetables	39	2	5	0	54
Banana	42	1	3	0	54
Other Fruit	48	0	4	0	48

19. Crop Losses

Crops	Major Field Losses	Field Loss Cause	Major Storage Losses	Storage Loss Cause
Gogo Rice	NA	NA	NA	NA
Rice	None	NA	None	NA
Maize	15%	Multiple	4%	Worms
Casssava	4%	Rodents	None	NA
Coffee (Cherries)	3%	Disease	None	NA
Coffee (Dry Beans)	8%	Disease	None	NA
Kidney Bean	None	NA	None	NA
Sweet Potato	2%	Animals	None	NA
Potato	None	NA	None	NA
Taro (Talas/Kontas)	None	NA	None	NA
Squash	None	NA	None	NA
Mung Bean	17%	Disease	None	NA
Soy Bean	None	NA	10%	Rodents
Coconut	None	NA	None	NA
Peanut	10%	Rodents	None	NA
Vegetables	8%	Disease	None	NA
Banana	None	NA	None	NA
Other Fruit	8%	Birds	None	NA

20. Purchased Inputs

Input	Percent Using
Manure	11%
Fertilizer	11%
Pesticide	6%
Herbicide	0%
Rice Seed	0%
Maize Seed	90%
Bean Seed	50%

21. Reason for not using fertilizer:

a. Do not like to use	6%
b. Do not require	25%
c. Do not know how to use	6%
d. Not available	63%
e. Too expensive	0%
f. Too far to carry	0%
g. Other	0%

2. Forestry

1. Percent of households using wood for cooking: 93 percent
2. Source of wood for cooking

a. Gather from forest	69%
b. Buy from a store	6%
c. Buy from wood salesman	25%

3. Percent of households planting trees to supply wood for cooking: 2 percent
4. Of those that planted trees for firewood, the households planted 10 trees on average in the last 3 years.
5. Percent of households hunting for:

a. Pigs	2%
b. Deer	2%
c. Other large animals	1%
d. Small animals	2%
e. Fish	2%
f. Birds	2%

6. ercent of households gathering plants for medicinal purposes: 7 percent

7. Production

Items	Annual Production Per Household	Annual Rp Received Per Household
Timber wood	160 cu m	Rp 800,000
Fuel wood	206 Bunch (.04 cu m)	Rp 436,000
Sandal wood	Kg	No Respondents
Honey	Liter	No Respondents
Rattan	piece	No Respondents
Bamboo	10 piece (1.85 m)	Rp 50,000
Candle Nut (Kemiri)	kg	No Respondents

3. Farm Implements

1. Average number of farm implements per household

Items	Number
Hoes	1.3
Axes	0.9
Shovels	1.1
Picks	1.6
Large knives	1.5
Sickle/Reaping Hook	0.5
Hand thresher	0
Rice miller	0
Crop drying area	0
Tarp/Canvas	1.1
Basket	2.0
Small cart pushed by person	0.2

2. Agricultural Equipment

Only 3% of households report owning or renting any mechanized farm equipment. Results from those using mechanized equipment.

Equipment	Percent Owning	Percent Renting	Days Rented Per Year	Rent Cost (Rp/day)
Tractor	50%	50%	3	Rp 600,000
Machine pulled plow	No Data	No Data	No Data	No Data
Animal pulled plow	50%	50%	8	Rp 100,000
Mech. water pump	No Data	No Data	No Data	No Data
Motorized thresher	No Data	No Data	No Data	No Data
Rice winnower	No Data	No Data	No Data	No Data
Rice/Corn mill	No Data	No Data	No Data	No Data
Motorized insecticide pump	No Data	No Data	No Data	No Data
Hand insecticide pump	0%	100%	2	Rp 100,000
Manual coffee grinder	No Data	No Data	No Data	No Data
Motor coffee grinder	No Data	No Data	No Data	No Data
Ox cart	50%	50%	3	Rp 150,000

4. Livestock

82% of households report owning some type of livestock.

1. Average Values Reported by Households

Animals	Value of Young Animal (Rp/each)	Value of Adult Animal (Rp/each)
Buffalo	Rp 1,063,000	Rp 2,917,000
Bali cow	No Respondents Yet	No Respondents Yet
Cow	Rp 800,000	Rp 1,988,000
Horse	Rp 725,000	Rp 1,476,000
Pig	Rp 399,000	Rp 1,048,000
Goat	Rp 208,000	Rp 547,000
Sheep	Rp 120,000	Rp 200,000
Chicken	Does Not Apply	Rp 90,000
Duck	Does Not Apply	Rp 50,000

2. Livestock Average Per Household For Those Who Own Livestock

Animals	Total Number	%. Sold Last Year	% Died/Lost Last Year	%. Stolen Last Year	% Eaten Last Year	% Bought Last Year
Buffalo	10	4%	18%	0%	2%	4%
Bali cow	No Data	No Data	No Data	No Data	No Data	No Data
Cow	4	8%	0%	0%	0%	4%
Horse	2	0%	6%	8%	3%	2%
Pig	3	15%	17%	7%	8%	28%
Goat	5	8%	8%	3%	6%	7%
Sheep	No Data	No Data	No Data	No Data	No Data	No Data
Chickn (a	5	10%	12%	1%	17%	40%
Duck	No Data	No Data	No Data	No Data	No Data	No Data

a) Adult animals only

3. Livestock

Animals	Percent Vaccinated
Buffalo	0%
Bali cow	No Data
Cow	0%
Horse	0%
Pig	2%
Goat	0%
Sheep	No Data
Chicken	0%
Duck	No Data

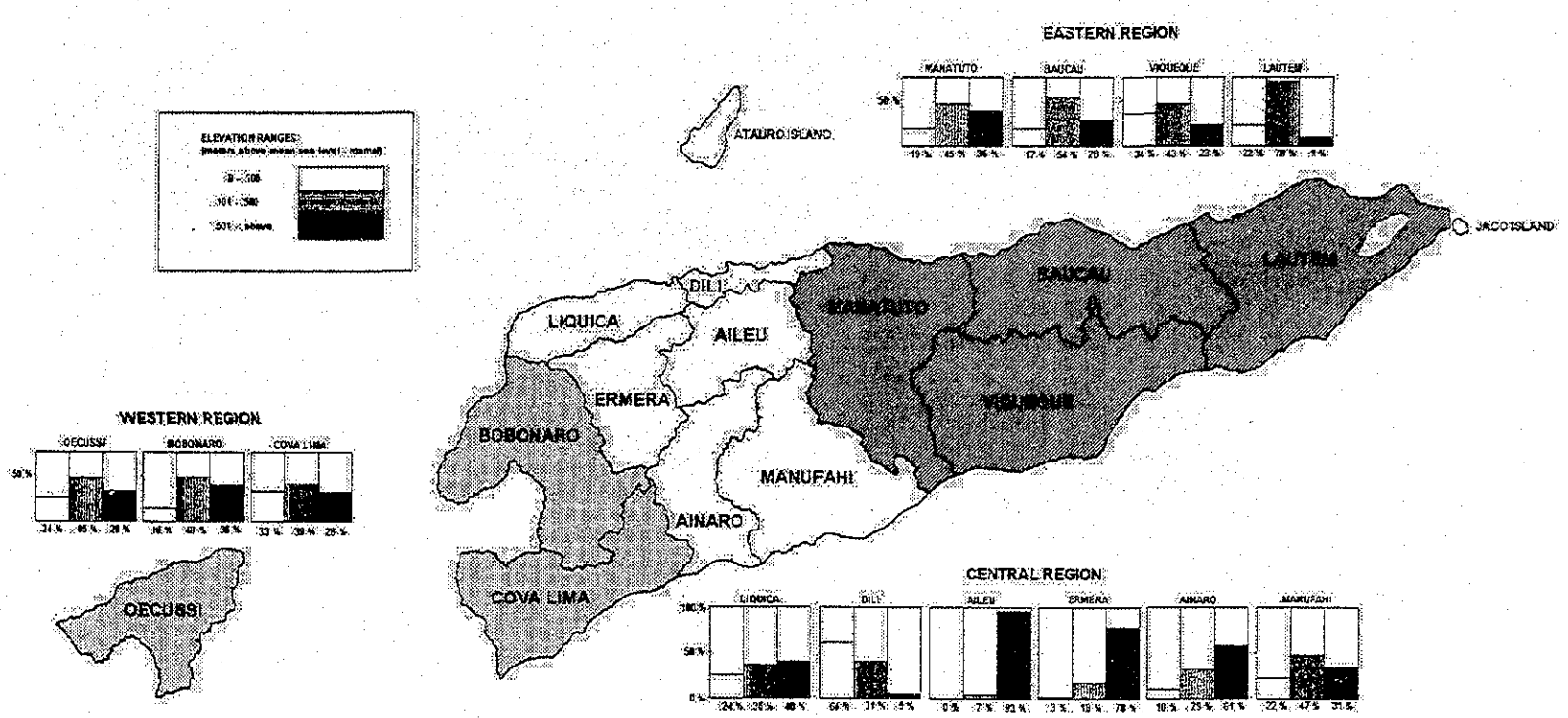


Figure N-1. Area and Elevation Map - East Timor

Figure N-2. Population Density Map - East Timor

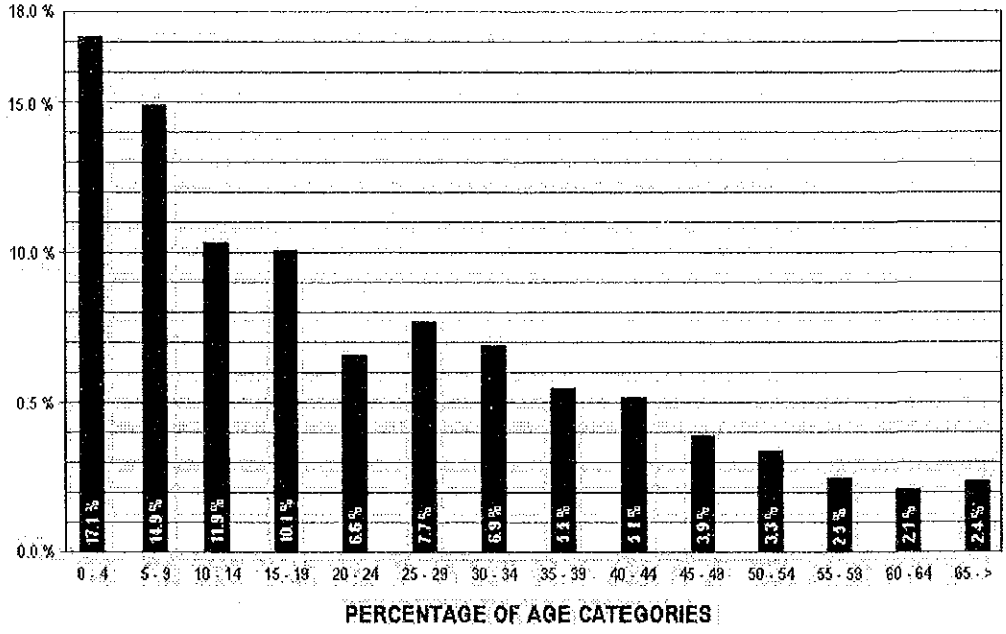


Figure N-3. Population Distribution by Age

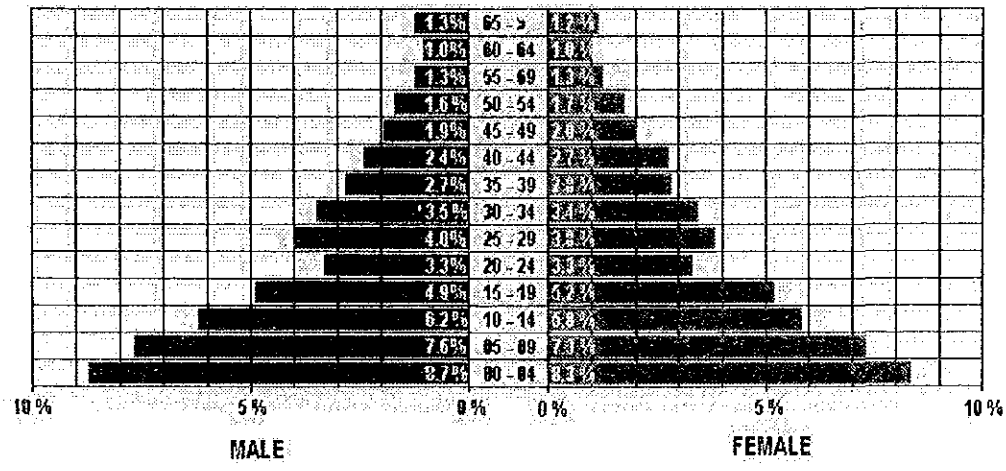


Figure N-4. Population Distribution by Sex

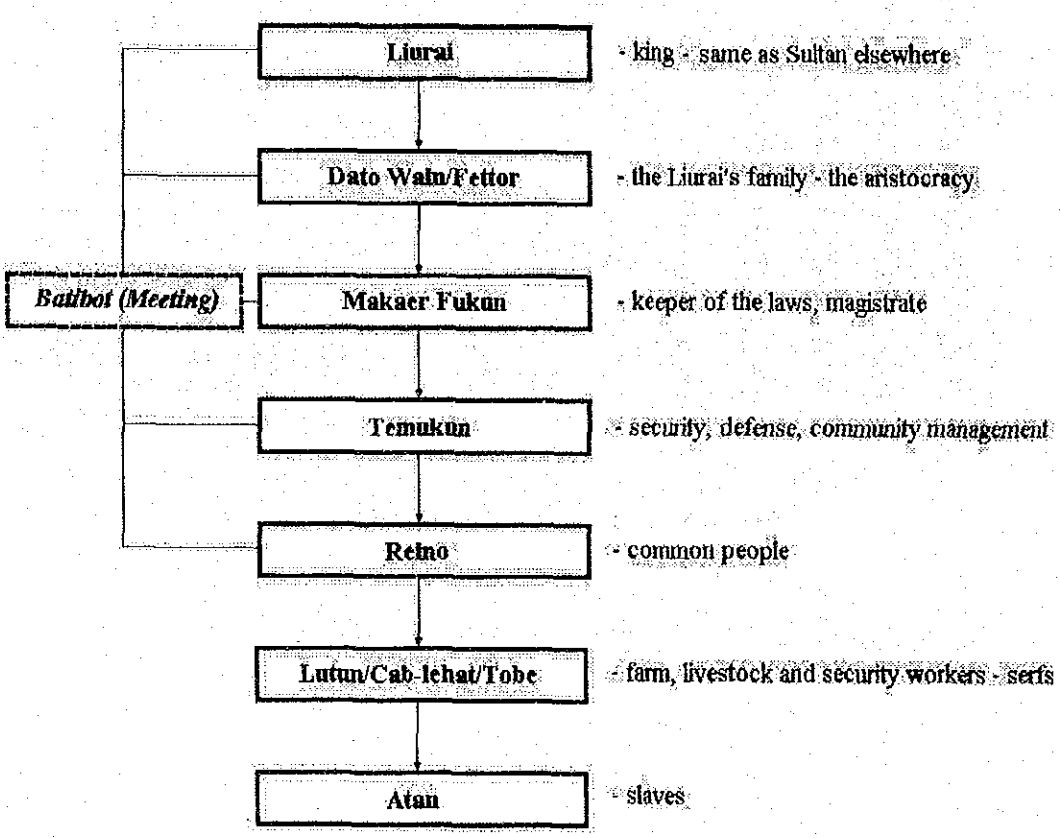


Figure N-5. Political Structure Before the Portuguese

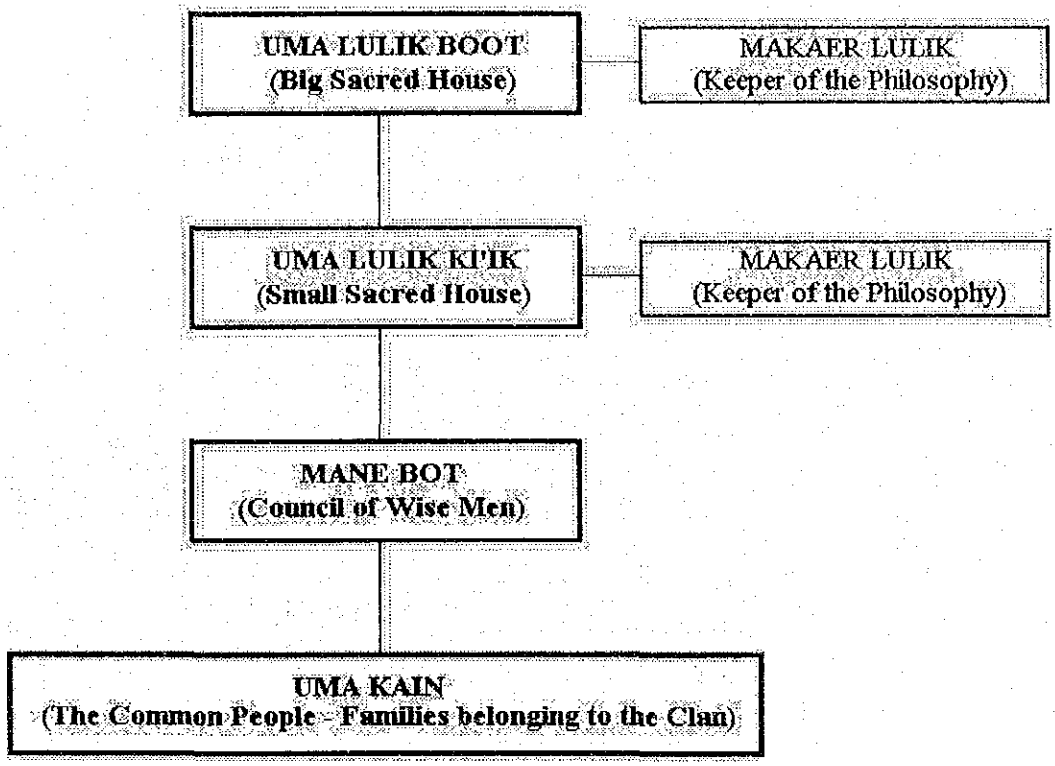


Figure N-6. Clan Structure

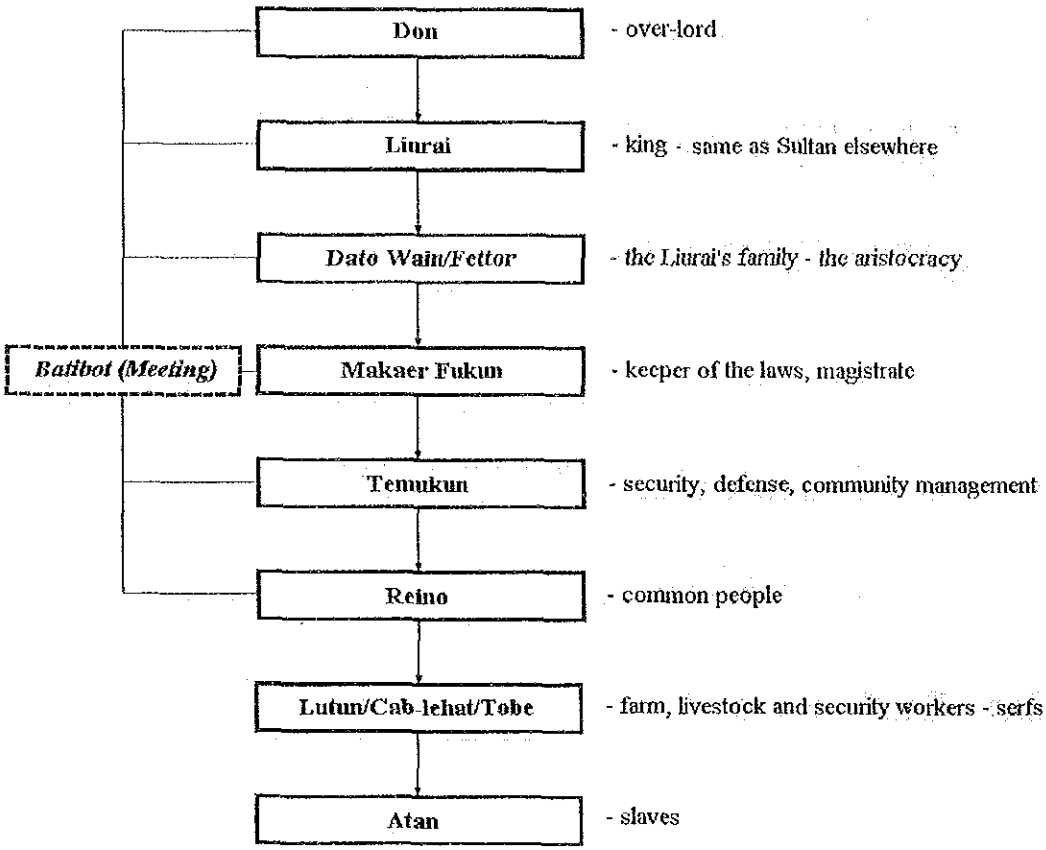


Figure N-7. Political Structure During the Portuguese Period

Uma Lulik at Lospalos,
Lautem District

Uma Lulik at Suco Watulete,
Baucau Sub-District,
Baucau District

Figure N-8 Uma Lulik - Commonly Found in Rural East Timor

ANNEX O. RESULTS OF THE WORKSHOP

CONTENTS

List of Figures

The Study Team conducted the workshop in Dili with the representatives of the ETTA-DAA, DAOs and the representatives of NGOs working in East Timor. The workshop were held in June, August and September 2001 with the following main objectives:

(1) To grasp the existing problems in agriculture, forestry and fishery sectors in East Timor from the beneficiaries' view point,

(2) To analyze the cause-effect relationships of those problems for the understanding of the problems' structure holistically,

(3) To identify the possible development approaches as the solutions of the problems, and

(4) To train the government officials at the central and district levels and transfer the technologies for the facilitation of the workshop.

O-1. The First Workshop in June

The workshop was held in two days and was attended by the staff of ETTA-DAA from both the offices at Dili and district offices. The workshop was focused on the subjects on livestock and non-government organizations.

O-2. The Second Workshop in August and September

The workshop was split into two two-day sessions due to time constraints of the participants. Based on the experience of the First Workshop, the participants were able to discuss the subjects deeper and thoughtfully. The Second Workshop covered all the four important sectors, i.e., crop production, livestock, fishery and forestry, and prepared the problem trees and objective trees of those sectors. The discussion was then directed on the issue of the capacity building of the farmers on crop production. The problems trees and objective trees, and the list of the participants are attached hereinafter

As it is shown in the problem trees, the participants identified the core problems and the direct causes of those problems in each sector as follows:

Sector	*Core Problems*	*Direct Causes*
1. Crop Production	Low Production	1. Total production area is small. 2. Low productivity 3. Farmers produce only for subsistence.
2. Livestock	Low contribution to income from livestock sector.	1. Difficult in trading 2. Low production 3. Low population

3. Fishery	Low income in fishery sector.	1. Low production in aquaculture 2. Low selling price of fish for fishers 3. Low production
4. Forestry	Forest area is reduced.	1. Forest is destroyed. 2. The government cannot protect the country forest.

The indirect causes of the core problems, i.e., those directly influencing the occurrences of the above direct causes were also discussed and are shown in the problems trees. The trees indicate that the solution of the core problems requires to deal with all the issues shown the trees.

Based on the problem trees, the objective trees were prepared with the classification of the possible development approaches. The objective trees show the ideal conditions which should appear if the identified problems are solved. The possible development approaches were then discussed in each sector and classified as follows:

Sector	Possible Development Approaches
1. Crop Production	1. Capacity building of farmers 2. Awareness building 3. Legal tools 4. Natural resources protection 5. Infrastructure
2. Livestock	1. Capacity building of people 2. Awareness building 3. Legal tools 4. Infrastructure
3. Fishery	1. Capacity building of people 2. Legal tools 3. Natural resources preservation 4. Aquaculture production 5. Facility equipment rehabiliation
4. Forestry	1. Capacity building of people 2. Laws/regulations/legal tools 3. Data update

As it is clearly indicated, the capacity building of the farmers and people are the essential approaches to tackle the identified problems for all the sectors. The discussion was therefore

concentrated on the capacity building issues[1], particularly on what kinds of activities would be useful for improving the capacity of the farmers and what consideration should be given in the planning and implementation of the variety of training programmes. The results of the discussion are described in the main text.

Attached are participants and the results of the workshop activities:

a. List of Participants

b. Problem Trees on:
   1. Crop Production
   2. Livestock
   3. Fishery
   4. Forestry

c. Objective Trees:
   1. Crop Production
   2. Livestock
   3. Fishery
   4. Forestry

[1] The focus was given only to the crop production sector due to the limitation of the time.

List of Attendance

JICA Study Team The Study on Integrated Agricultural Development of East Timor

Subject : **Following-Up of The Second Workshop in Dill**
Place : Civil Service Academy, Comoro, Dili, East Timor
Date : 13 to 14 of September 2001

NO.	NAME	POSITION
1	Abilio Ornai	DAAO - Baucau
2	Albertino Gemino	DAAO - Liquisa
3	Albino S. Pinto	DAAO - Viqueque
4	Apolinasio Bese	District Agriculture - Ermera
5	Bill Ruscoe	JICA Study Team
6	Caitano C.	DAA Forestry - Coffee Dept.
7	Edmundo da Costa	DAAO - Ainaro
8	Egas B. da Silva	DAA National Training Coordinator
9	Ermenegildo D.	PROBEM
10	Eufrasia de Jesus Soares	Koord. NGO Moris ba Dame - Ermera
11	Eugenio Borges	DAAO - Bobonaro
12	Fernando Egidio	DAA Forestry - Coffee Dept.
13	Florindo Barroto	Irrigation Section
14	Gil F. Oliveira	DAAO - Dili
15	Helio Jose A.DC.	ETFOG
16	Herman Koopman	CARE International
17	Hernani Silva	DAA
18	Isaac R. Xiemenes	CRS - Baucau
19	Joao Antalmo	DAAO - Manufahi
20	Jedevan Exposto (Head of group farmer at Mounalin Raimean)	Ka. Kelompok Pertanian Ermera - Mounalin Raimean (group farmer at Ermera organize by Moris ba Dame)
21	Joaquim Mota	DAAO - Manatuto
22	Jorge Oki	DAAO - Covalima
23	Jose Oki	DAAO - Oecusse
24	Lachlan McKenzie	E.T.P.D.I.
25	Masoyoshi Takehara	JICA HQ East Timor
26	Mateus dos Santos	ETFOG
27	Naomi Ichimiya	World Vision
28	Nina	JICA Study Team
29	Nuno Freitas	JICA Study Team
30	Okabe Hiroshi	JICA Study Team (facilitator)
31	Paul Tomassen	USC Canada East Timor
32	Pe. Julio Crispin X.B.	Director Caritas Baucau
33	Rita Keyes	GOAL
34	Rozendo J. Goncalves (Head of group farmer at Ludu Roe)	Ka. Kelompok Pertanian Ermera - Ludu Roe (Group of farmers at Ermera organize by Morisba Dame)
35	Vicente S. Soares	DAAO - Aileu

Figure O-1

CROP PRODUCTION
PROBLEM TREE
POHON PERMASALAHAN
HASIL PANEN

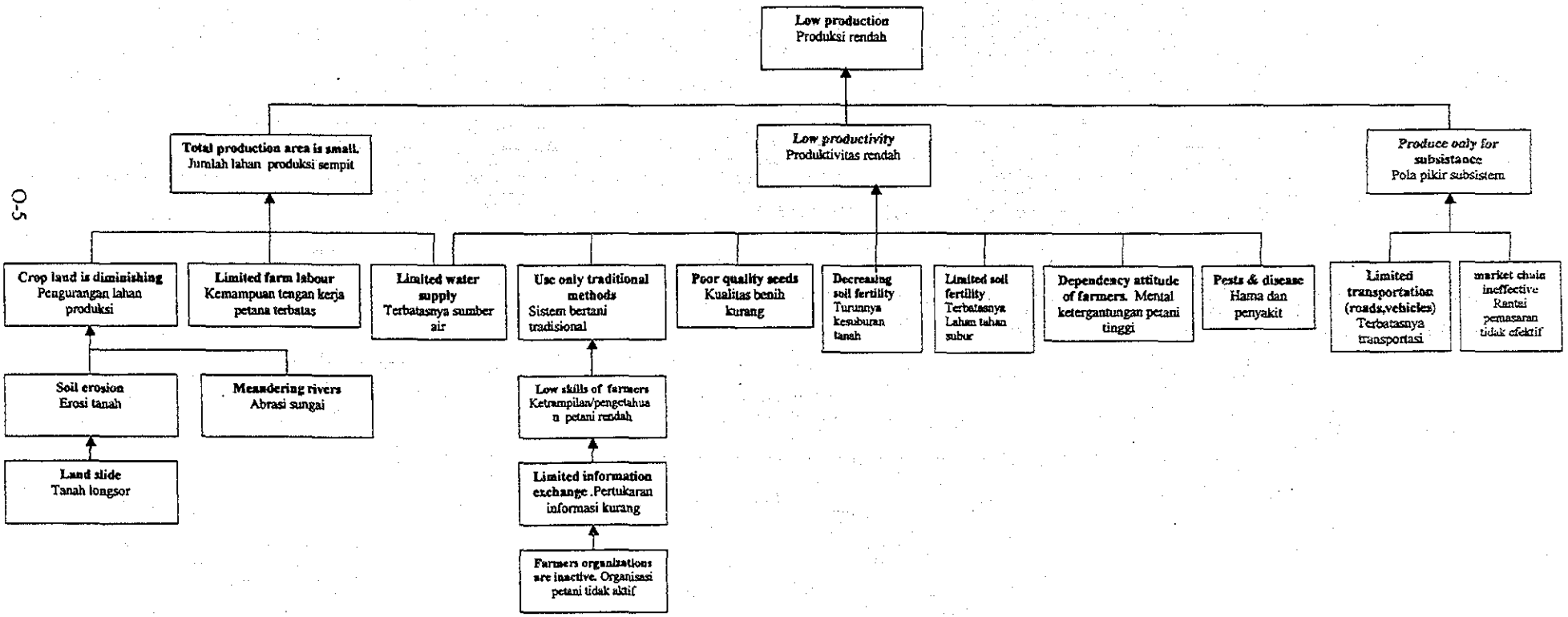


Figure O-2

LIVESTOCK PROBLEM TREE
POHON PERMASALAHAN PETERNAKAN

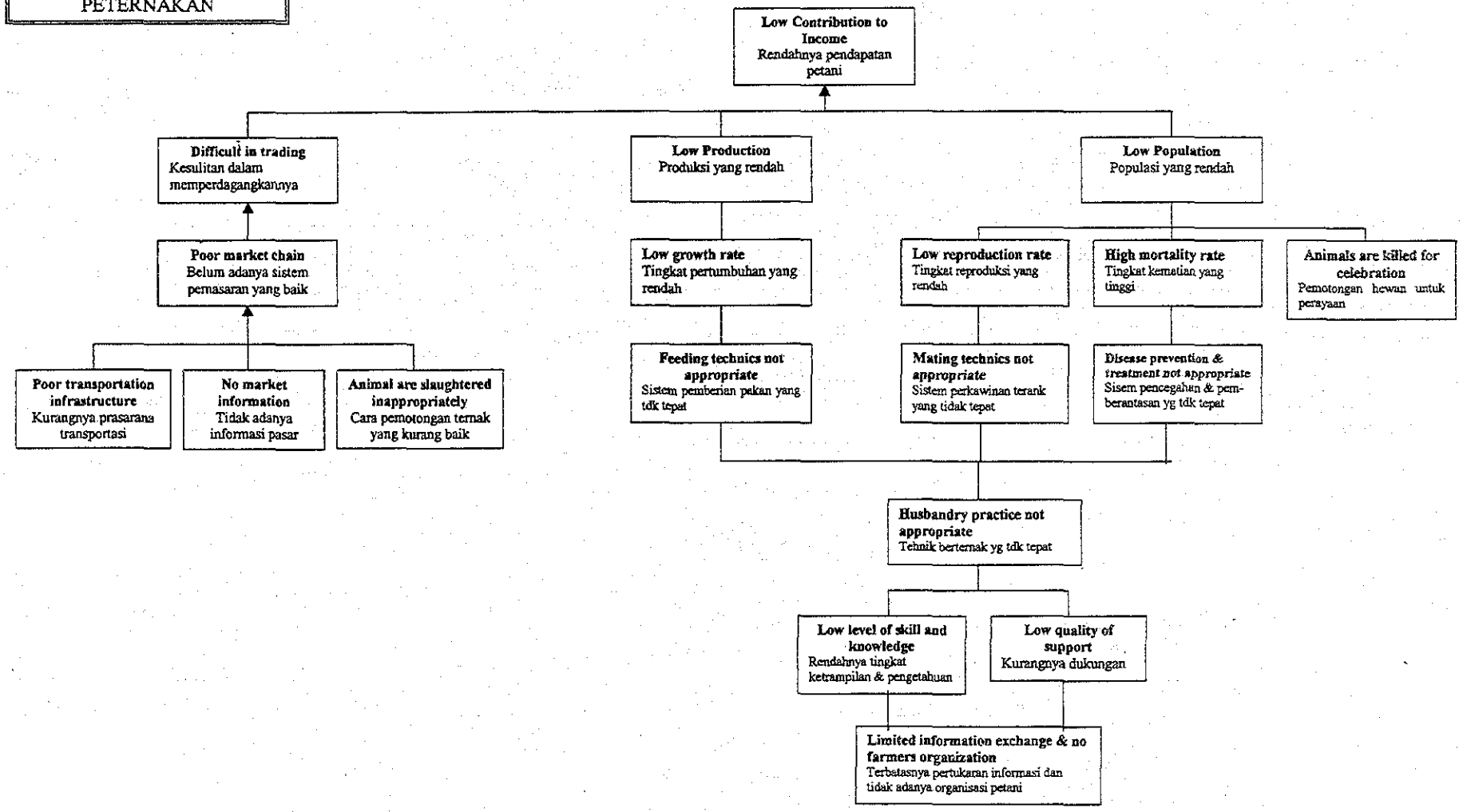


Figure O-3

FISHERY
PROBLEM TREE
POHON PERMASALAHAN
PERIKANAN

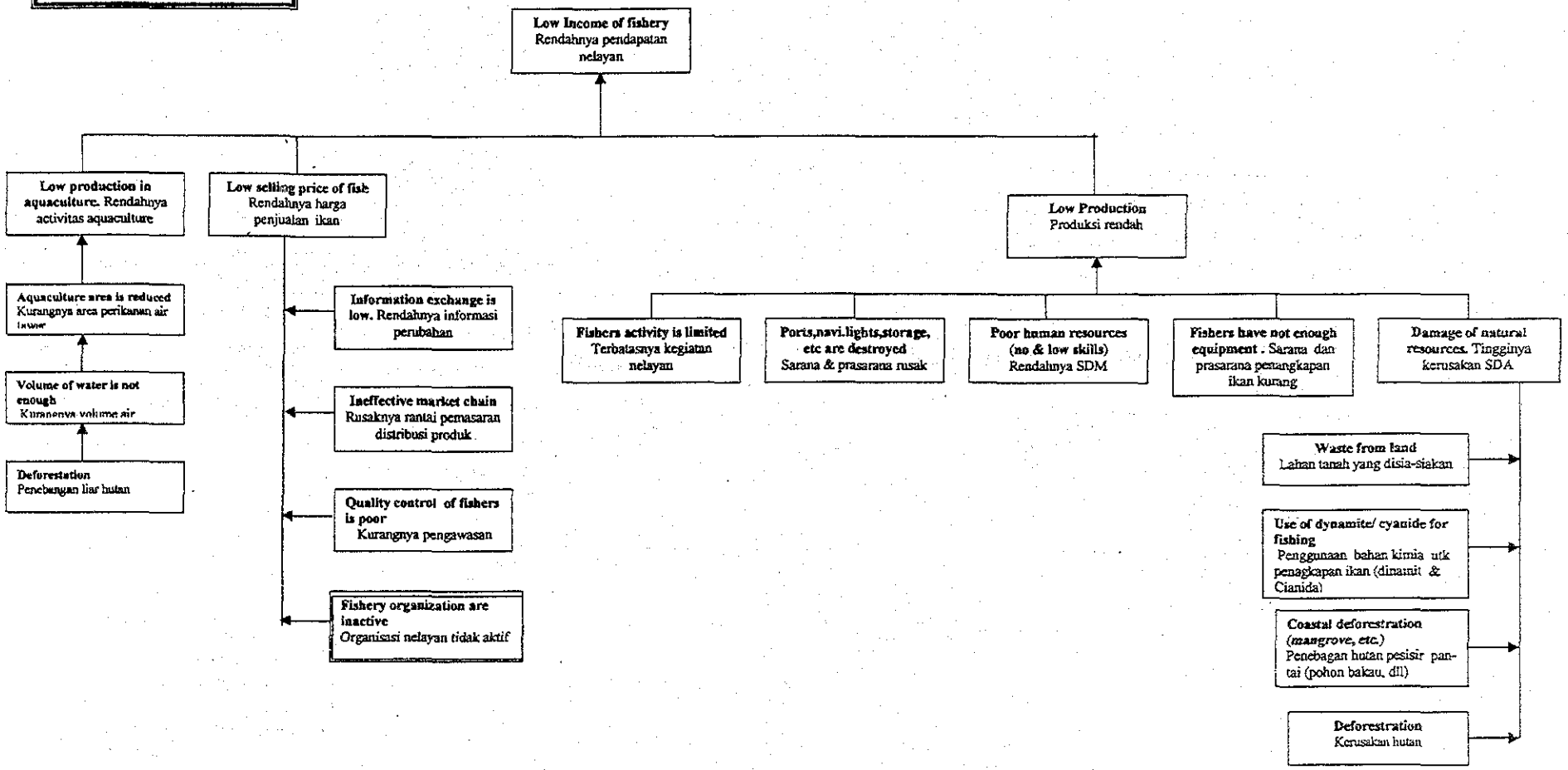


Figure O-4

FORESTRY PROBLEM TREE
POHON PERMASALAHAN KEHUTANAN

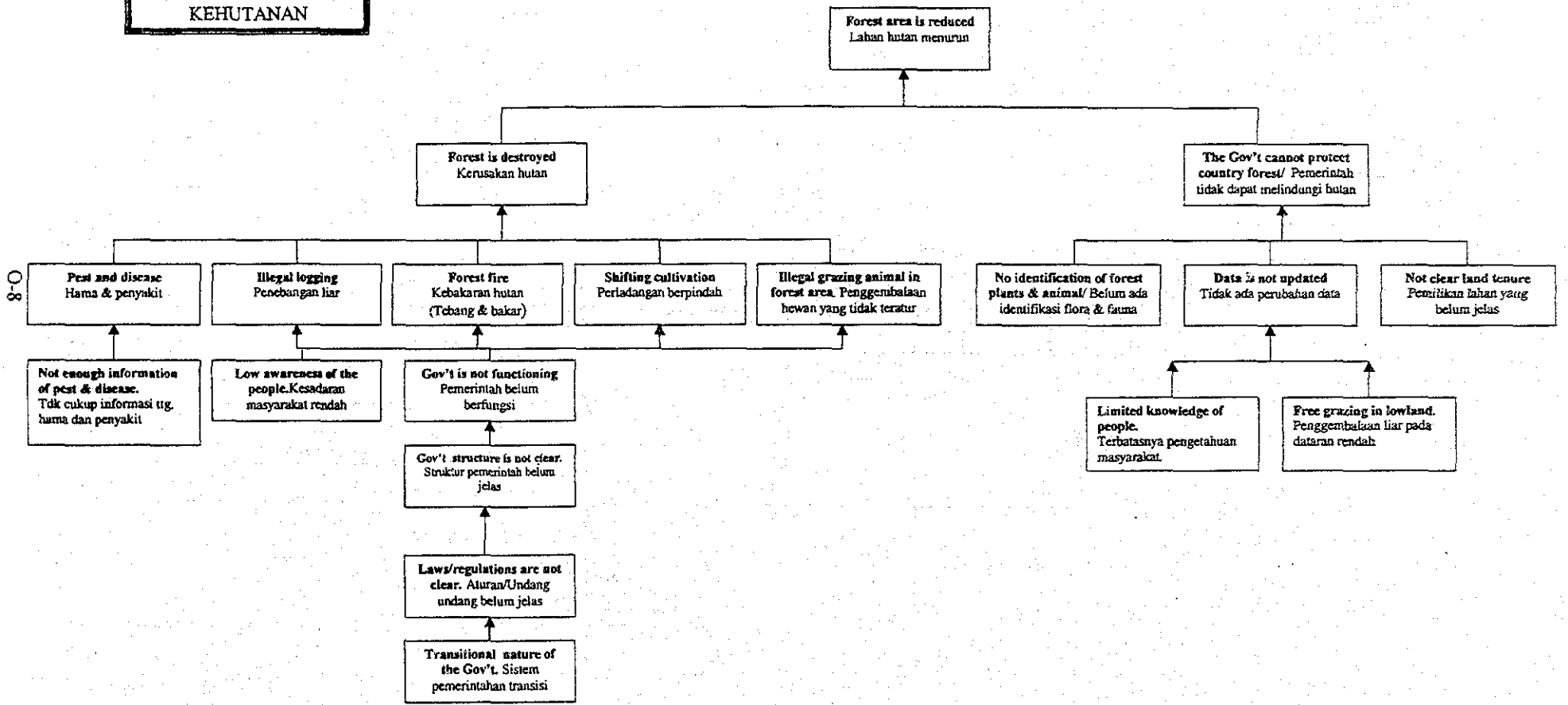


Figure O-5

CROP PRODUCTION OBJECTIVE TREE
POHON OBJEKTIV
HASIL PANEN

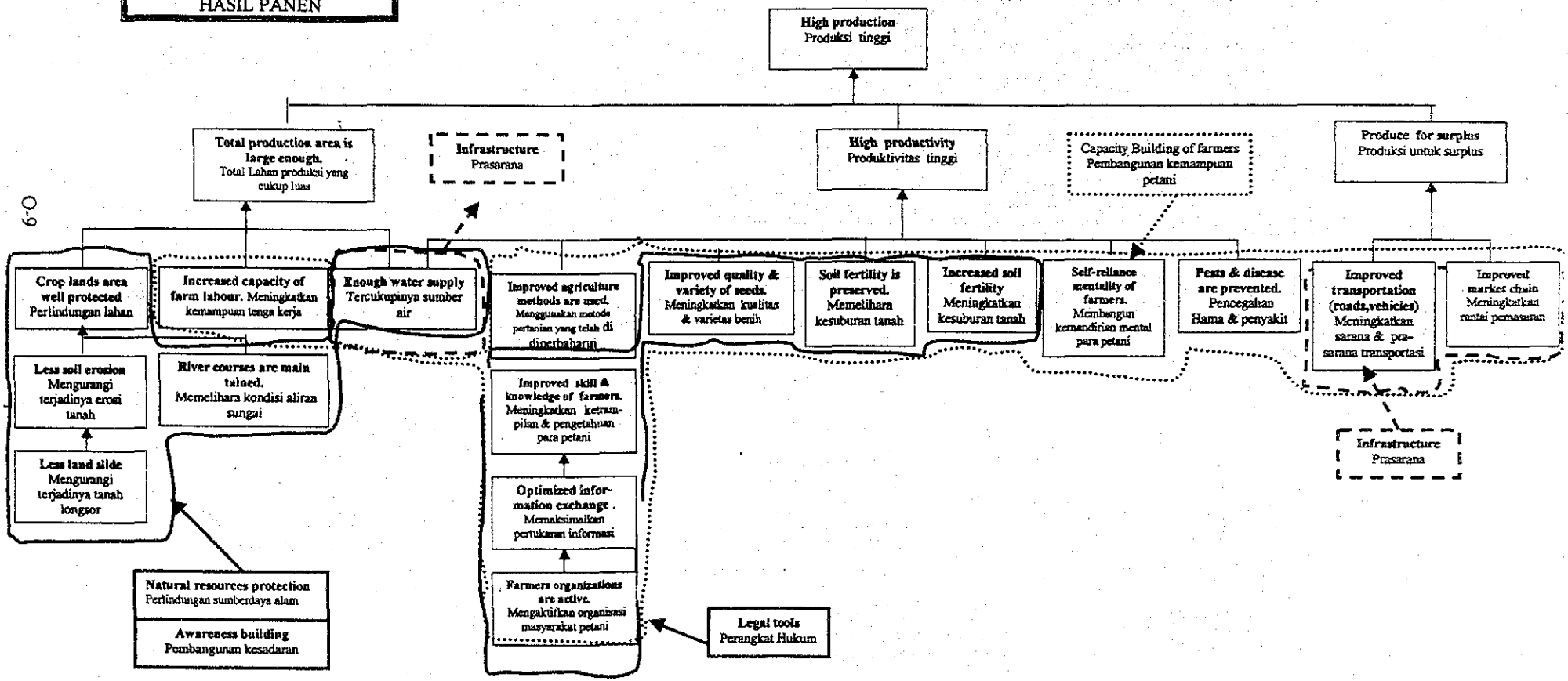


Figure O-6

LIVESTOCK OBJECTIVE TREE
POHON OBYEKTIF PETERNAKAN

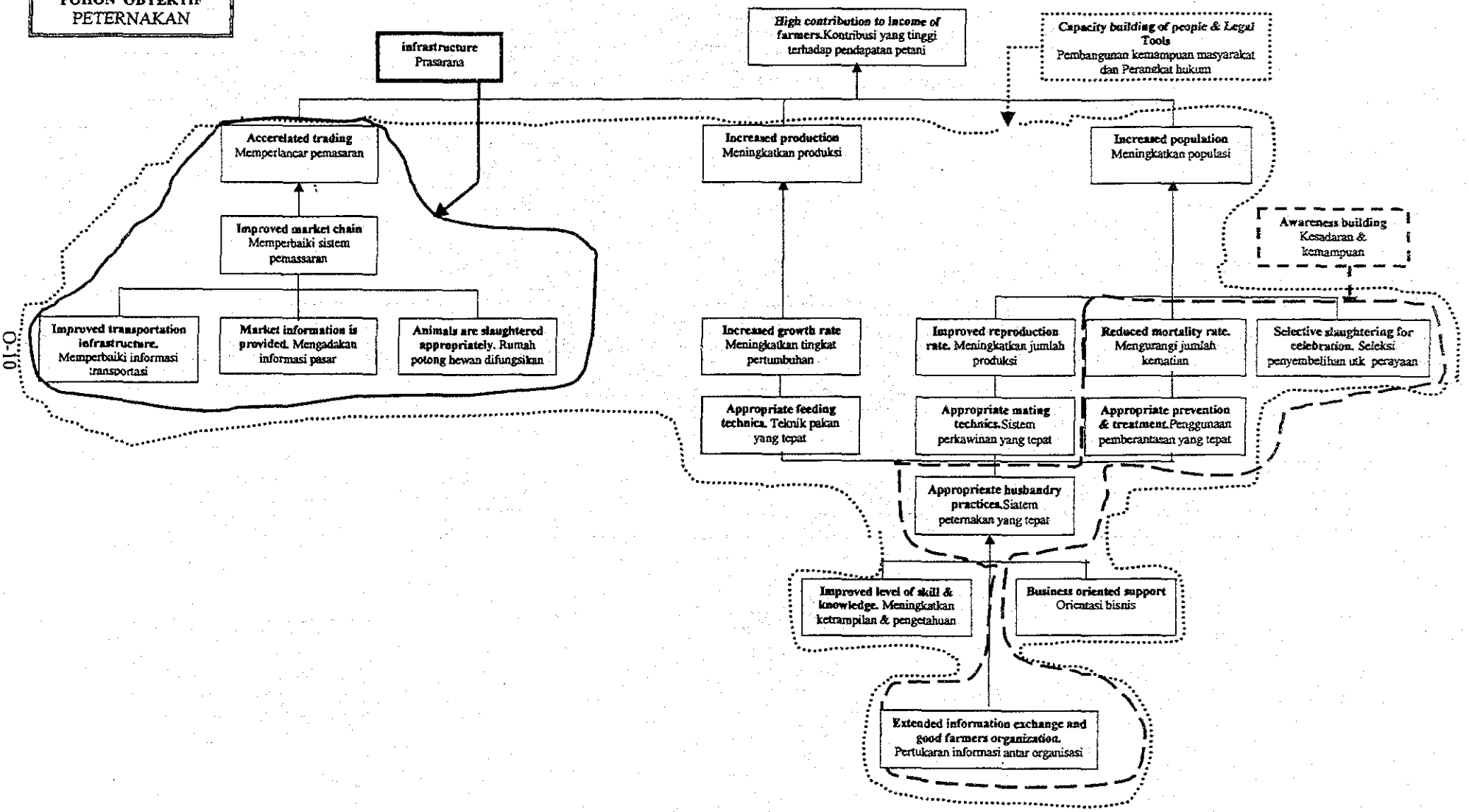


Figure O-7

FISHERY OBJECTIVE TREE
POHON OBJECTIV PERIKANAN

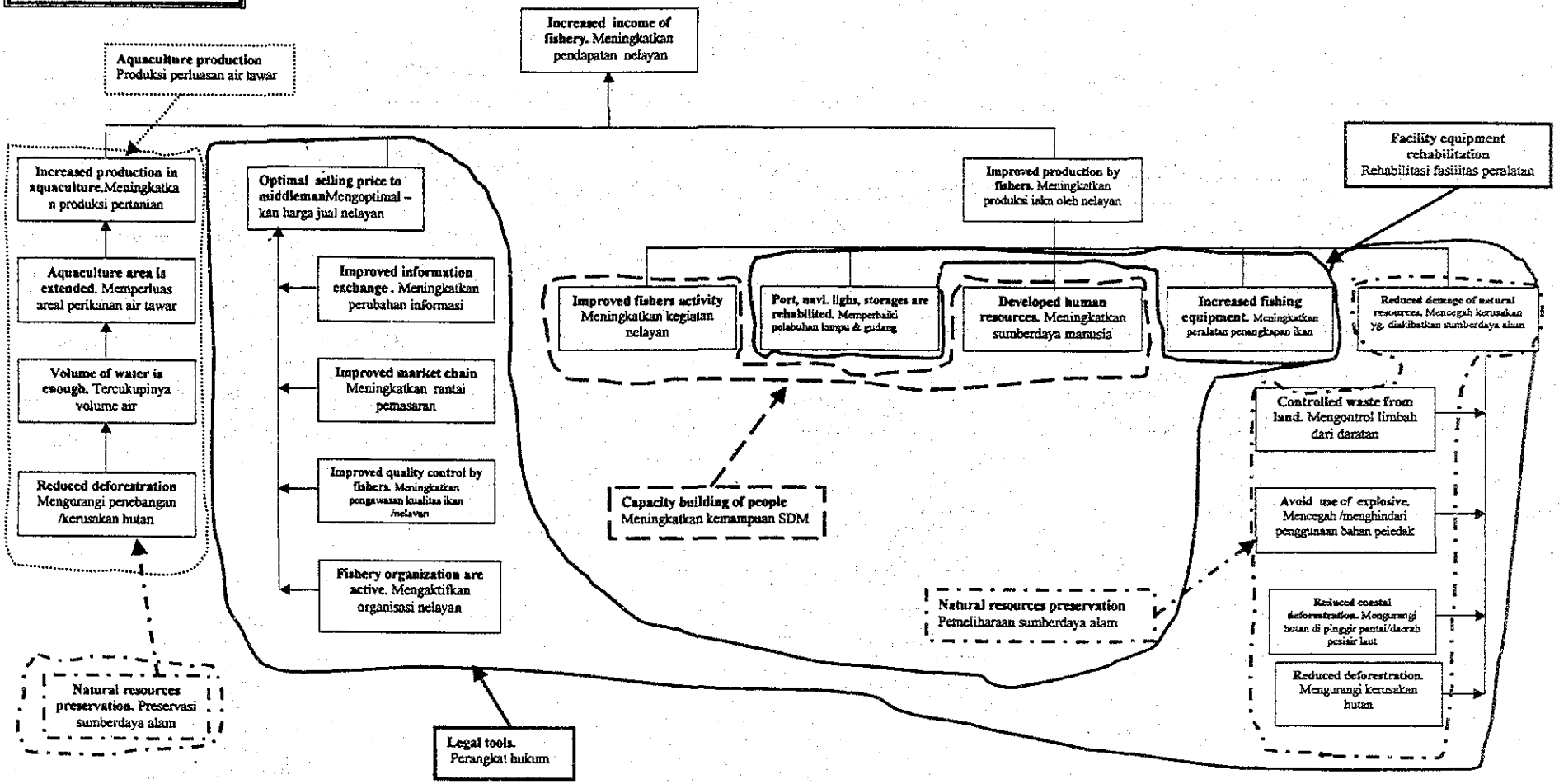
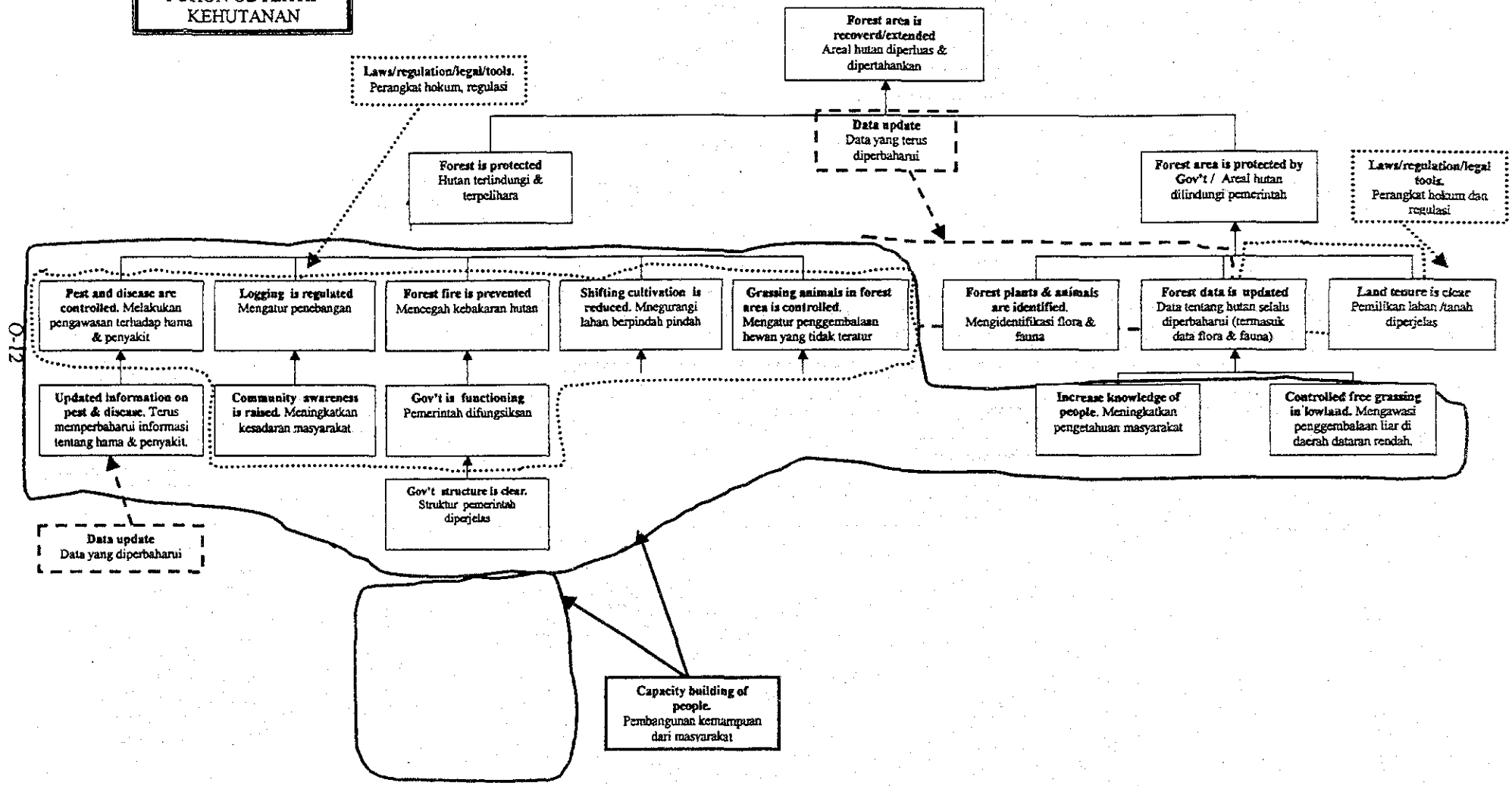


Figure O-8

FORESTRY
OBJECTIVE TREE
POHON OBYEKTIF
KEHUTANAN



ANNEX P. ANALYSIS OF DEVELOPMENT SCENARIOS

CONTENTS

List of Tables

List of Figures

Table P-1 Case Studies on Analysis of Staple Food Supply and Demand for Development Scenario Formulation

Development Stage	Development Plan in Case of Full-Development												Development Plan in Case of Minimum-Development											
	W/O Repatriation (Alt.-1)						*W Repatriation (Alt.-2)*						*W/O Repatriation (Alt.-1)*						*W Repatriation (Alt.-2)*					
	2,100 Kcal (Alt-A)			2,300 Kcal (Alt-B)			2,100 Kcal (Alt-A)			2,300 Kcal (Alt-B)			2,100 Kcal (Alt-A)			2,300 Kcal (Alt-B)			2,100 Kcal (Alt-A)			2,300 Kcal (Alt-B)		
	Op.-1	OP.-2	Op.-3	Op.-1	OP.-2	Op.-3	Op.-1	OP.-2	Op.-3	Op.-1	OP.-2	Op.-3	Op.-1	OP.-2	Op.-3	Op.-1	OP.-2	Op.-3	Op.-1	OP.-2	Op.-3	Op.-1	OP.-2	Op.-3
Mid-Term Development Plan (2003-2007)																								
Long-Term Development Plan (2008-2017)																								

Table P-2 Population Projection without Repatriate (Alt.-1)

Year		2001 a	2002 b	2003 b	2004 b	2005 b	2006 b	2007 b			
Population	(Peo)	737,811	752,051	766,566	781,361	796,441	813,246	830,405			
Growth Rate	(%)	-	1.93	1.93	1.93	1.93	2.11	2.11			
Year		2008 b	2009 b	2010 b	2011 b	2012 b	2013 b	2014 b	2015 b	2016 b	2017 b
Population	(Peo)	847,927	865,818	884,087	904,333	925,042	946,225	967,894	990,059	1,013,325	1,037,138
Growth Rate	(%)	2.11	2.11	2.11	2.29	2.29	2.29	2.29	2.29	2.35	2.35

Growth Rate : *World Population Prospects* , United Nations, 1999

a : *Civil Registry in East Timor - Result* - 02 July 2001

b : ex. Pop(2002) = Pop(2001) + Pop(2001) * 0.0193

Table P-3 Population Projection with Repatriate (Alt.-2)

Year		1997 c	2001 d	2002 e	2003 e	2004 e	2005 e	2006 e	2007 e		
Repatriate	(Peo)	-	-	11,982	11,982	11,982	11,982	11,982	11,982		
Pre-Growth	(Peo)	-	-	749,793	776,246	803,210	830,694	858,708	888,809		
Population	(Peo)	881,600	737,811	764,264	791,228	818,712	846,726	876,827	907,563		
Growth Rate	(%)	-	-	1.93	1.93	1.93	1.93	2.11	2.11		
Year		2008 f	2009 f	2010 f	2011 f	2012 f	2013 f	2014 f	2015 f	2016 f	2017 e
Population	(Peo)	926,713	946,267	966,233	988,360	1,010,993	1,034,145	1,057,827	1,082,051	1,107,479	1,133,505
Growth Rate	(%)	2.11	2.11	2.11	2.29	2.29	2.29	2.29	2.29	2.35	2.35

Repatriate : (Pop(1997)-Pop(2001)) * 50% / 6year

Pre-Growth : Pop (last year) + Repatriate

Growth Rate : *World Population Prospects* , United Nations, 1999

c : *East Timor in Figures 1997*

d : *Civil Registry in East Timor - Result* - 02 July 2001

e : ex. Pop(2002) = Pre(2002) + Pre(2002) * 0.0193

f : ex. Pop(2008) = Pop(2007) + Pop(2007) * 0.0211

Table P-4 Alternatives of Paddy Rice Productions in Full-Development

Case: Option-1, WO/S, Yield level: 2.50 ton/ha, Crop intensity: 120 %

Paddy Field and Yield of Respective Levels of Irrigation Conditions (Option-1)

Category of Irrigation	Repaired Year	Cropped Area (ha) (1)	Cropped Area (ha) (2)	Cropped Area (ha) (3)		Yield (ton/ha)	Production (ton)
1. With Facility							
1.1 Function				{ (1) + (2) } x 1.20			
(13,750 ha)	2002	13,750	805	14,555 x 1.20	17,466	1.80	31,439
	2003	13,750	2,123	15,873 x 1.20	19,048	1.94	36,952
	2004	13,750	3,268	17,018 x 1.20	20,422	2.08	42,477
	2005	13,750	4,413	18,163 x 1.20	21,796	2.22	48,386
	2006	13,750	5,558	19,308 x 1.20	23,170	2.36	54,680
	2007	13,750	6,703	20,453 x 1.20	24,544	2.50	61,359
	2017	13,750	18,169	31,919 x 1.20	38,303	2.50	95,757
1.2 Improved	2002	1,318					
(19,314 ha)	2003	1,145					
	2004	1,145					
	2005	1,145					
	2006	1,145					
	2007	1,145					
	2017	1,145					
1.3 Not-Function				{ (1) + (2) } x 0.50			
(19,314 ha)	2002	19,314	-805	18,509 x 0.50	9,255	1.50	13,882
	2003	19,314	-2,123	17,191 x 0.50	8,596	1.60	13,753
	2004	19,314	-3,268	16,046 x 0.50	8,023	1.70	13,639
	2005	19,314	-4,413	14,901 x 0.50	7,451	1.80	13,411
	2006	19,314	-5,558	13,756 x 0.50	6,878	1.90	13,068
	2007	19,314	-6,703	12,611 x 0.50	6,306	2.00	12,611
	2017	19,314	-18,169	1,145 x 0.50	573	2.00	1,145
2. W/O Facility				{ (1) + (2) } x 0.20			
Rain-Fed Area	2002	8,841	0	8,841 x 0.20	1,768	1.50	2,652
(8,841 ha)	2003	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2004	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2005	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2006	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2007	8,841	0	8,841 x 0.20	1,768	1.50	2,652
Total	2002						47,973
	2003						53,357
	2004						58,768
	2005						64,449
	2006						70,401
	2007						76,622
	2017						99,554

Note: 1. Cropped area (2) means rehabilitated area annually and/or accumulated.

2. Second paddy rice intensity is 20 % Of irrigated functional area, surveyed by DAA.

3. Ratio of cropped area (3), 0.50, assumes50 % of non-functional irrigated area taking into account past cropped records.

4. Ratio of cropped area (3), 0.20, assumes 20 % of rain-fed area.

Table P-5 Alternatives of Paddy Rice Productions in Full-Development

Case: Option-2, WO/S, Yield level: 2.50 ton/ha, Crop intensity: 160 %

Paddy Field and Yield of Respective Levels of Irrigation Conditions (Option-2)

Category of Irrigation	Repaired Year	Cropped Area (ha) (1)	Cropped Area (ha) (2)	Cropped Area (ha) (3)		Yield (ton/ha)	Production (ton)
1. With Facility							
1.1 Function				{ (1) + (2) } x 1.60			
(13,750 ha)	2002	13,750	805	14,555 x 1.60	23,288	1.80	41,918
	2003	13,750	2,123	15,873 x 1.60	25,397	1.94	49,270
	2004	13,750	3,268	17,018 x 1.60	27,229	2.08	56,636
	2005	13,750	4,413	18,163 x 1.60	29,061	2.22	64,515
	2006	13,750	5,558	19,308 x 1.60	30,893	2.36	72,907
	2007	13,750	6,703	20,453 x 1.60	32,725	2.50	81,812
	2017	13,750	18,169	31,919 x 1.60	51,070	2.50	127,676
1.2 Improved	2002	1,318					
(19,314 ha)	2003	1,145					
	2004	1,145					
	2005	1,145					
	2006	1,145					
	2007	1,145					
	2017	1,145					
1.3 Not-Function				{ (1) + (2) } x 0.50			
(19,314 ha)	2002	19,314	-805	18,509 x 0.50	9,255	1.50	13,882
	2003	19,314	-2,123	17,191 x 0.50	8,596	1.60	13,753
	2004	19,314	-3,268	16,046 x 0.50	8,023	1.70	13,639
	2005	19,314	-4,413	14,901 x 0.50	7,451	1.80	13,411
	2006	19,314	-5,558	13,756 x 0.50	6,878	1.90	13,068
	2007	19,314	-6,703	12,611 x 0.50	6,306	2.00	12,611
	2017	19,314	-18,169	1,145 x 0.50	573	2.00	1,145
2. W/O Facility				{ (1) + (2) } x 0.20			
Rain-Fed Area	2002	8,841	0	8,841 x 0.20	1,768	1.50	2,652
(8,841 ha)	2003	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2004	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2005	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2006	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2007	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2017	8,841	0	8,841 x 0.20	1,768	1.50	2,652
Total	2002						58,452
	2003						65,675
	2004						72,927
	2005						80,578
	2006						88,628
	2007						97,075
	2017						131,473

Note: 1. Cropped area (2) means rehabilitated area annually and/or accumulated.

2. Second paddy rice intensity is 20 % 0f irrigated functional area, surveyed by DAA.

3. Ratio of cropped area (3), 0.50, assumes50 % of non-functional irrigated area taking into account past cropped records.

4. Ratio of cropped area (3), 0.20, assumes 20 % of rain-fed area.

Table P-6 Alternatives of Paddy Rice Productions in Full-Development

Case: Option-3, W/S, Yield level: 3.00 ton/ha, Crop intensity: 120 %

Paddy Field and Yield of Respective Levels of Irrigation Conditions (Option-3)

Category of Irrigation	Repaired Year	Cropped Area (ha) (1)	Cropped Area (ha) (2)	Cropped Area (ha) (3)		Yield (ton/ha)	Production (ton)
1. With Facility							
1.1 Function				{ (1) + (2) } x 1.20			
(13,750 ha)	2002	13,750	805	14,555 x 1.20	17,466	1.80	31,439
	2003	13,750	2,123	15,873 x 1.20	19,048	2.04	38,857
	2004	13,750	3,268	17,018 x 1.20	20,422	2.28	46,561
	2005	13,750	4,413	18,163 x 1.20	21,796	2.52	54,925
	2006	13,750	5,558	19,308 x 1.20	23,170	2.76	63,948
	2007	13,750	6,703	20,453 x 1.20	24,544	3.00	73,631
	2017	13,750	18,169	31,919 x 1.20	38,303	3.00	114,908
1.2 Improved	2002	1,318					
(19,314 ha)	2003	1,145					
	2004	1,145					
	2005	1,145					
	2006	1,145					
	2007	1,145					
	2017	1,145					
1.3 Not-Function				{ (1) + (2) } x 0.50			
(19,314 ha)	2002	19,314	-805	18,509 x 0.50	9,255	1.50	13,882
	2003	19,314	-2,123	17,191 x 0.50	8,596	1.60	13,753
	2004	19,314	-3,268	16,046 x 0.50	8,023	1.70	13,639
	2005	19,314	-4,413	14,901 x 0.50	7,451	1.80	13,411
	2006	19,314	-5,558	13,756 x 0.50	6,878	1.90	13,068
	2007	19,314	-6,703	12,611 x 0.50	6,306	2.00	12,611
	2017	19,314	-18,169	1,145 x 0.50	573	2.00	1,145
2. W/O Facility				{ (1) + (2) } x 0.20			
Rain-Fed Area	2002	8,841	0	8,841 x 0.20	1,768	1.50	2,652
(8,841 ha)	2003	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2004	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2005	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2006	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2007	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2017	8,841	0	8,841 x 0.20	1,768	1.50	2,652
Total	2002						47,973
	2003						55,262
	2004						62,852
	2005						70,988
	2006						79,668
	2007						88,894
	2017						118,705

Note: 1. Cropped area (2) means rehabilitated area annually and/or accumulated.

2. Second paddy rice intensity is 20 % 0f irrigated functional area, surveyed by DAA.

3. Ratio of cropped area (3), 0.50, assumes50 % of non-functional irrigated area taking into account past cropped records.

4. Ratio of cropped area (3), 0.20, assumes 20 % of rain-fed area.

Table P-7 Alternatives of Paddy Rice Productions in Min.-Development

Case: Option-3, W/S, Yield level: 3.00 ton/ha, Crop intensity: 120 %

Paddy Field and Yield of Respective Levels of Irrigation Conditions (Option-3)

Category of Irrigation	Repaired Year	Cropped Area (ha) (1)	Cropped Area (ha) (2)	Cropped Area (ha) (3)		Yield (ton/ha)	Production (ton)
1. With Facility							
1.1 Function				{ (1) + (2) } x 1.20			
(13,750 ha)	2002	13,750	805	14,555 x 1.20	17,466	1.80	31,439
	2003	13,750	2,123	15,873 x 1.20	19,048	2.04	38,857
	2004	13,750	2,321	16,071 x 1.20	19,285	2.28	43,970
	2005	13,750	2,519	16,269 x 1.20	19,523	2.52	49,197
	2006	13,750	2,717	16,467 x 1.20	19,760	2.76	54,539
	2007	13,750	2,915	16,665 x 1.20	19,998	3.00	59,994
1.2 Improved	2002	1,318					
(3,113 ha)	2003	198					
	2004	198					
	2005	198					
	2006	198					
	2007	198					
1.3 Not-Function				{ (1) + (2) } x 0.50			
(19,314 ha)	2002	19,314	-805	18,509 x 0.50	9,255	1.50	13,882
	2003	19,314	-2,123	17,191 x 0.50	8,596	1.60	13,753
	2004	19,314	-2,321	16,993 x 0.50	8,497	1.70	14,444
	2005	19,314	-2,519	16,795 x 0.50	8,398	1.80	15,116
	2006	19,314	-2,717	16,597 x 0.50	8,299	1.90	15,767
	2007	19,314	-2,915	16,399 x 0.50	8,200	2.00	16,399
2. W/O Facility				{ (1) + (2) } x 0.20			
Rain-Fed Area	2002	8,841	0	8,841 x 0.20	1,768	1.50	2,652
(8,841 ha)	2003	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2004	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2005	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2006	8,841	0	8,841 x 0.20	1,768	1.50	2,652
	2007	8,841	0	8,841 x 0.20	1,768	1.50	2,652
Total	2002						47,973
	2003						55,262
	2004						61,067
	2005						66,965
	2006						72,958
	2007						79,045

Note: 1. Cropped area (2) means rehabilitated area annually and/or accumulated.

2. Second paddy rice intensity is 20 % Of irrigated functional area, surveyed by DAA.

3. Ratio of cropped area (3), 0.50, assumes50 % of non-functional irrigated area taking into account past cropped records.

4. Ratio of cropped area (3), 0.20, assumes 20 % of rain-fed area.

Table P-8 Proportion of Consumable Amount

Crop	Post-harvest Loss a (%)	Feed b (%)	Seed c (%)	Total d=a+b+c (%)	Proportion e=100-d (%)
Paddy	45	0	1.5	47	53
Maize	20	13	1.4	35	65
Cassava	20	2	0.0	22	78

a : An estimate by JICA expert of Farm Machinery

b : Cattle Food (Country Consumption) / Output (Production)

NERACA BAHAN MAKANAN PROPINSI TIMOR TIMUR 2000

c : Table P-8 Proportion of Seed

d : Roundup by tenth

Table P-9 Proportion of Seed

Crop	Need a (kg/ha)	Keeping Loss b (%)	Total c=a+ab (kg/ha)	Yield d (kg/ha)	Proportion e=c/d (%)
Paddy	40	0	40	2,678	1.5
Maize	20	30	26	1,857	1.4
Cassava	0	0	0	4,010	0.0

a : An estimate by JICA expert of Farm Management / Agronomy

b : An estimate by JICA expert of Farm Machinery

d : *STATISTIK PERTANIAN 2000*

Table P-10 Target of Foodstuff Balance (1997 Base)

Foodstuff Item	Alternative-A			Alternative-B		
	Target Calories Per Capita a (kcal./day)	Proportion (%)	Rank	Target Calories Per Capita b (kcal./day)	Proportion (%)	Rank
GRAIN	1,452.37	68		1,612.15	70	
Wheat Flour	31.55	1	11	31.55	1	11
Rice	700.98	33	2	780.29	34	2
Maize	711.39	33	1	791.87	34	1
Wet Maize	8.44	0	16	8.44	0	16
FOOD STARCHY CONTAINS	203.39	10		203.39	9	
Sweet Potato	51.03	2	7	51.03	2	7
Cassava	146.44	7	3	146.44	6	3
Sago palm powder	5.92	0	17	5.92	0	17
SUGAR	36.13	2		36.13	2	
FRUIT/SEED OIL	218.16	10		218.16	9	
FRUIT OTHER	18.32	1		18.32	1	
VEGETABLE	40.24	2		40.24	2	
MEAT	31.41	1		31.41	1	
EGG	5.95	0		5.95	0	
MILK	0.10	0		0.10	0	
FISH	5.14	0		5.14	0	
VEGETABLE OIL	126.46	6		126.46	5	
ANIMAL OIL/FAT	2.55	0		2.55	0	
Total	2,140.22	100		2,300.00	100	

Source : NERACA BAHAN MAKANAN PROPINSI TIMOR TIMUR 1999

a : Rice, Maize and Cassava are calculated in relation to the Table P-10 Calories of Staple Foods

b : Rice and Maize are calculated for the total calories of 2,300 kcal/day using the same proportion of "a"

Table P-11 Calories of Staple Foods

Crop	Production in 1997 a (t)	Propotion of Consumable b (%)	Consumable Amount c=ab (t)	Population in 1997 d (people)	Consumption per Capita e=c/d (gr/people)	Consumption per Capita Day f=e/365 (gr/people/Day)	Calories per 100gr g (kcal)	Calories per Capita Day h=fg/100 (kcal)	Propotion of Energy i (%)
Local Rice(Paddy)	37,968	53	20,123	881,600	22,826	63	364	228	15
Import Rice(Milled)	41,845	100	41,845		47,465	130	364	473	30
Maize	99,204	65	64,483		73,143	200	355	711	46
Cassava	41,379	78	32,276		36,611	100	146	146	9
Total/Average	220,396	72	158,727	881,600	180,045	493	316	1,559	100
Proportion (%) of 2,100 calorie/people/day								74	

a : STATISTIK PERTANIAN 2000, Paddy = Wetland Paddy + Dryland Paddy

a : Import Rice = NERACA BAHAN MAKANAN PROPINSI TIMOR TIMUR 1999

b : Table P-7 Proportion of Consumable Amount

d : East Timor in Figures 1997

g : List of Foodstuff composition, International table of Foodstuff composition

Table P-12 Alternative Study of Paddy Rice Production in Full-Developmen

(Case: Option-III, W/S, Yield level: 3.0ton/ha, Crop intensty: 120%.)

Paddy field and yield of respective levels of irrigation conditions (Option-3)
Additional Condition: Full-Scale Development Plan

Category of Rice Production	2002	2003	2004	2005	2006	2007
1. Proposed Improved Area(ha)	805	1,318	1,145	1,145	1,145	1,145
2. Rice Pproduction on Functional Area						
(1) Cropped Area (ha)	13,750	14,555	15,873	17,018	18,163	19,308
(2) Proposed Improved Area (ha)	805	1,318	1,145	1,145	1,145	1,145
(3) Cropped Area (ha) = (1)+(2)	14,555	15,873	17,018	18,163	19,308	20,453
(4) Cropped Area (ha) = (3)*Crop Iintencity 120%	17,466	19,048	20,422	21,796	23,170	24,544
(5) Yield (ton/ha)	1.80	2.04	2.28	2.52	2.76	3.00
(6) Production (ton) = (4)*(5)	31,439	38,857	46,561	54,925	63,948	73,631
3. Rice Production on Non-Functional Area						
(1) Non-Functional Area (ha) up to 2001	19,314	18,509	17,191	16,046	14,901	13,756
(2) Proposed Improved Area (ha)	-805	-1,318	-1,145	-1,145	-1,145	-1,145
(3) Non-Functional Area after Improvement = (1)-(2)	18,509	17,191	16,046	14,901	13,756	12,611
(4) Cropped Area (ha) = (3)*50%	9,255	8,596	8,023	7,451	6,878	6,306
(5) Yield (ton/ha)	1.50	1.60	1.70	1.80	1.90	2.00
(6) Production (ton) = (4)*(5)	13,882	13,753	13,639	13,411	13,068	12,611
4. Rice Production on Rain-Fed Area						
(1) Rain-Fed Area (ha)	8,841	8,841	8,841	8,841	8,841	8,841
(2) Cropped Area (ha)= (1)*20%	1,768	1,768	1,768	1,768	1,768	1,768
(3) Yield (ton/ha)	1.50	1.50	1.50	1.50	1.50	1.5
(4) Production (ton) =(2)*(3)	2,652	2,652	2,652	2,652	2,652	2,652
Annual Rice Produntion from 2003 to 2007	47,973	55,262	62,852	70,988	79,668	88,894

Table P-13 Alternative Study of Paddy Rice Production in Min.-Developmer

(Case: Option-III, W/S, Yield level: 3.0ton/ha, Crop intensty: 120%.)

Paddy field and yield of respective levels of irrigation conditions (Option-3)
Additional Condition: Minimum-Scale Development Plan

Category of Rice Production	2002	2003	2004	2005	2006	2007
1. Proposed Improved Area(ha)	805	1,318	198	198	198	198
2. Rice Pproduction on Functional Area						
(1) Cropped Area (ha)	13,750	14,555	15,873	16,071	16,269	16,467
(2) Proposed Improved Area (ha)	805	1,318	198	198	198	198
(3) Cropped Area (ha) = (1)+(2)	14,555	15,873	16,071	16,269	16,467	16,665
(4) Cropped Area (ha) = (3)*Crop Iintencity 120%	17,466	19,048	19,285	19,523	19,760	19,998
(5) Yield (ton/ha)	1.80	2.04	2.28	2.52	2.76	3.00
(6) Production (ton) = (4)*(5)	31,438	38,857	43,970	49,197	54,538	59,994
3. Rice Production on Non-Functional Area						
(1) Non-Functional Area (ha) up to 2001	19,314	18,509	17,191	16,993	16,795	16,597
(2) Proposed Improved Area (ha)	-805	-1,318	-198	-198	-198	-198
(3) Non-Functional Area after Improvement = (1)-(2)	18,509	17,191	16,993	16,795	16,597	16,399
(4) Cropped Area (ha) = (3)*50%	9,255	8,596	8,497	8,398	8,299	8,200
(5) Yield (ton/ha)	1.50	1.60	1.70	1.80	1.90	2.00
(6) Production (ton) = (4)*(5)	13,882	13,753	14,444	15,116	15,767	16,399
4. Rice Production on Rain-Fed Area						
(1) Rain-Fed Area (ha)	8,841	8,841	8,841	8,841	8,841	8,841
(2) Cropped Area (ha)= (1)*20%	1,768	1,768	1,768	1,768	1,768	1,768
(3) Yield (ton/ha)	1.50	1.50	1.50	1.50	1.50	1.5
(4) Production (ton) =(2)*(3)	2,652	2,652	2,652	2,652	2,652	2,652
Annual Rice Produntion from 2003 to 2007	47,972	55,262	61,066	66,965	72,957	79,045

Figure P -1 Alternative Cases of Agricultural Development Scenario