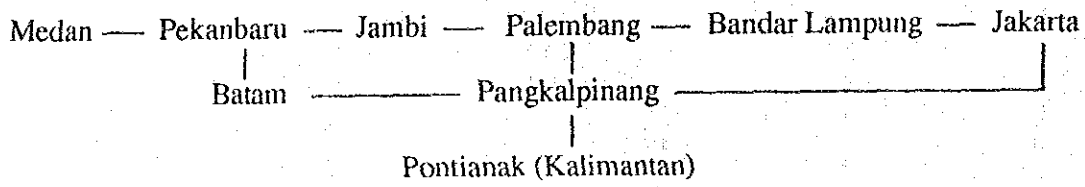
8.2 NEW BACKBONE TRANSMISSION FIBER OPTIC SYSTEM

8.2.1 Objectives of the Project and its Role in the Regional Development

1) To carry big telephone traffic from Medan-Pekanbaru-Jambi-Palembang-Bandar Lampung to Jakarta.
2) To make network cost cheap.
3) To improve speech quality especially SCR.

8.2.2 Location

This is an installation project of optical fiber cable in following routes.



8.2.3 Executing Agency

Directorate General of Post and Telecommunications, Ministry of Tourism, Post and Telecommunications

8.2.4 Expected Benefits

1) Value Added

   a) The people will use advanced telecommunication service.
   b) The enterprises and government organization can make their own information system easily using this big capacity transmission system.

2) Employment

   a) Good communication makes chances to get good work for people.
   b) And the system also needs some maintenance persons in itself.

3) Poverty Alleviation

   a) Through telecommunication, market becomes close to the site to get market information about business
   b) They can get information about business
   c) They support poverty alleviation

4) Support for Economic Activity

   a) Getting market information
   b) Communicating business information
   c) Having good opportunity of business

5) Social Development

   a) Keep social security
   b) Quick action for emergency time

6) Human Development

a) By getting information smoothly from outside, they can have much knowledge and they can promote themselves to higher level.

7) Environment

a) Quick action by information from a looking post

8.2.5 Outline of the Project

Based on the future telephone demand, in the year 2000, the telephone demand will be about 6 times as 1992, in 2010 it will become more than 10 times than today. It means the telephone traffic also increases in proportion to the demand. Therefore, the telephone network needs a new big capacity transmission system. It is clear that the traffic to big cities or economic areas like Jakarta, Medan or Batam will need big transmission route around the year 2000.

This optical fiber cable installation project, whose location is shown in Figure 8.2.1, is devided into two parts:

Part 1: The route on the ground of Sumatra Island;
Medan-Pekanbaru-Jambi-Palembang-Bandar Lampung-Jakarta

Part 2: The Submarine routes composed of;
Palembang-Pangkalpinang-Jakarta
Pekanbaru-Batam-Pangkalpinang
Pangkalpinang-Pontianak

1) System Condition

a) Transmission capacity at the initial time;
   i) In the ground route
      Medan to Pekanbaru: 622 Mb/s 1 unit
      Pekanbaru to Palembang: 622 Mb/s 2 units
      Palembang to Jakarta: 622 Mb/s 3 units
   ii) In the Submarine route
      In submarine cable transmission route, generally 3 transmission units are the muximum. Therefore, the transmission speed becomes higher for one transmission system, such as 2.49Gb/s (32,256 speech channels)

      Palembang to Pangkalpinang: 622 Mb/s 1 unit
      Pangkalpinang to Pontianak: 622 Mb/s 1 unit
      Pangkalpinang to Jakarta: 2.49 Gb/s 1 unit
      Pangkalpinang to Batam Island: 622 Mb/s 1 unit
      Pekanbaru to Batam Island: 622 Mb/s 1 unit

b) The number of fiber cores; 12

2) Installation Conditions

a) Land cable
   i) Bury under ground directly
   ii) Burial depth is 60 cm
b) Submarine portion
   i) Cable will be laid and buried by the cable ship
c) In-station

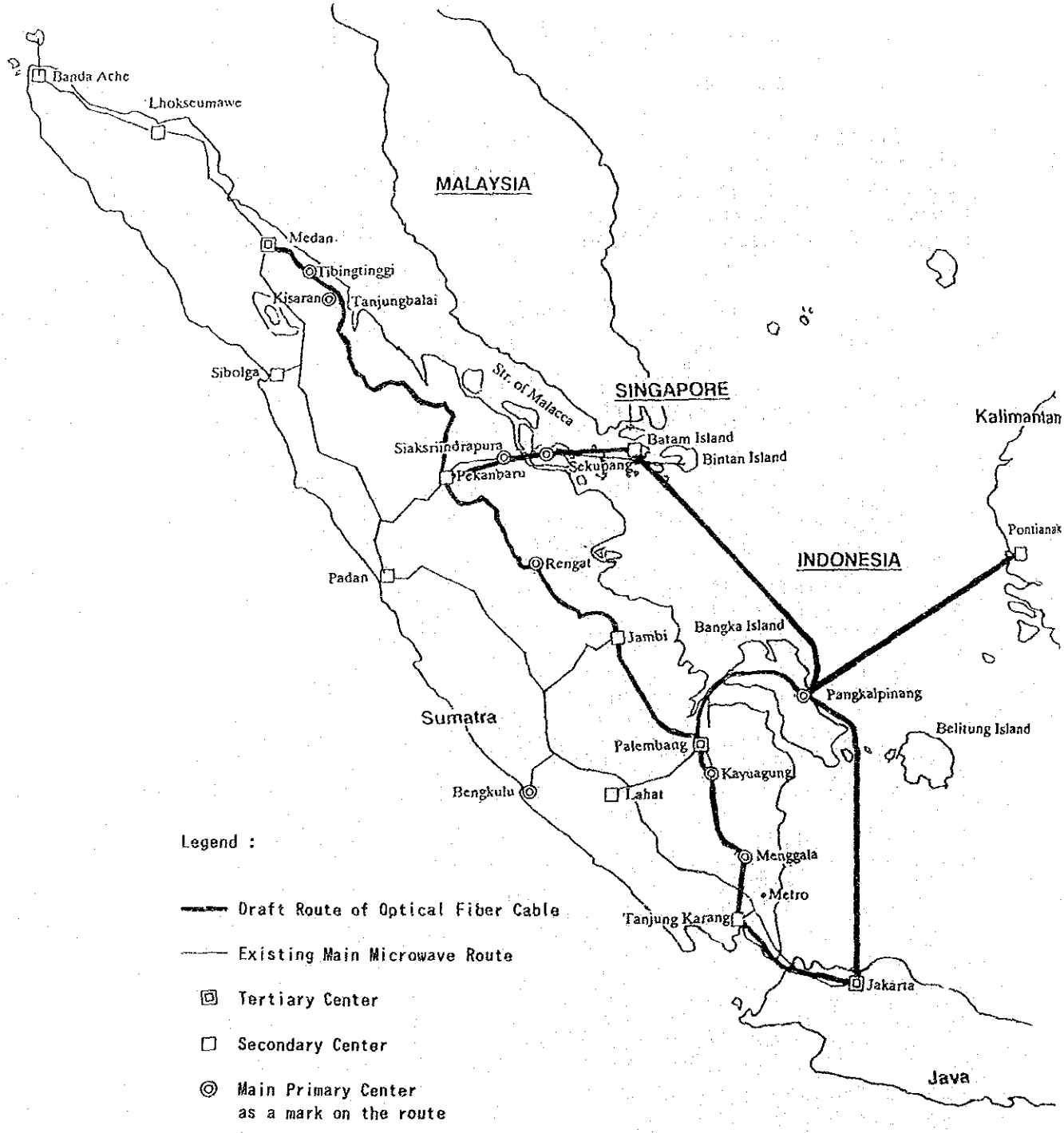


Figure 8.2.1 Optical Fiber Cable Route Plan in Sumatra Area

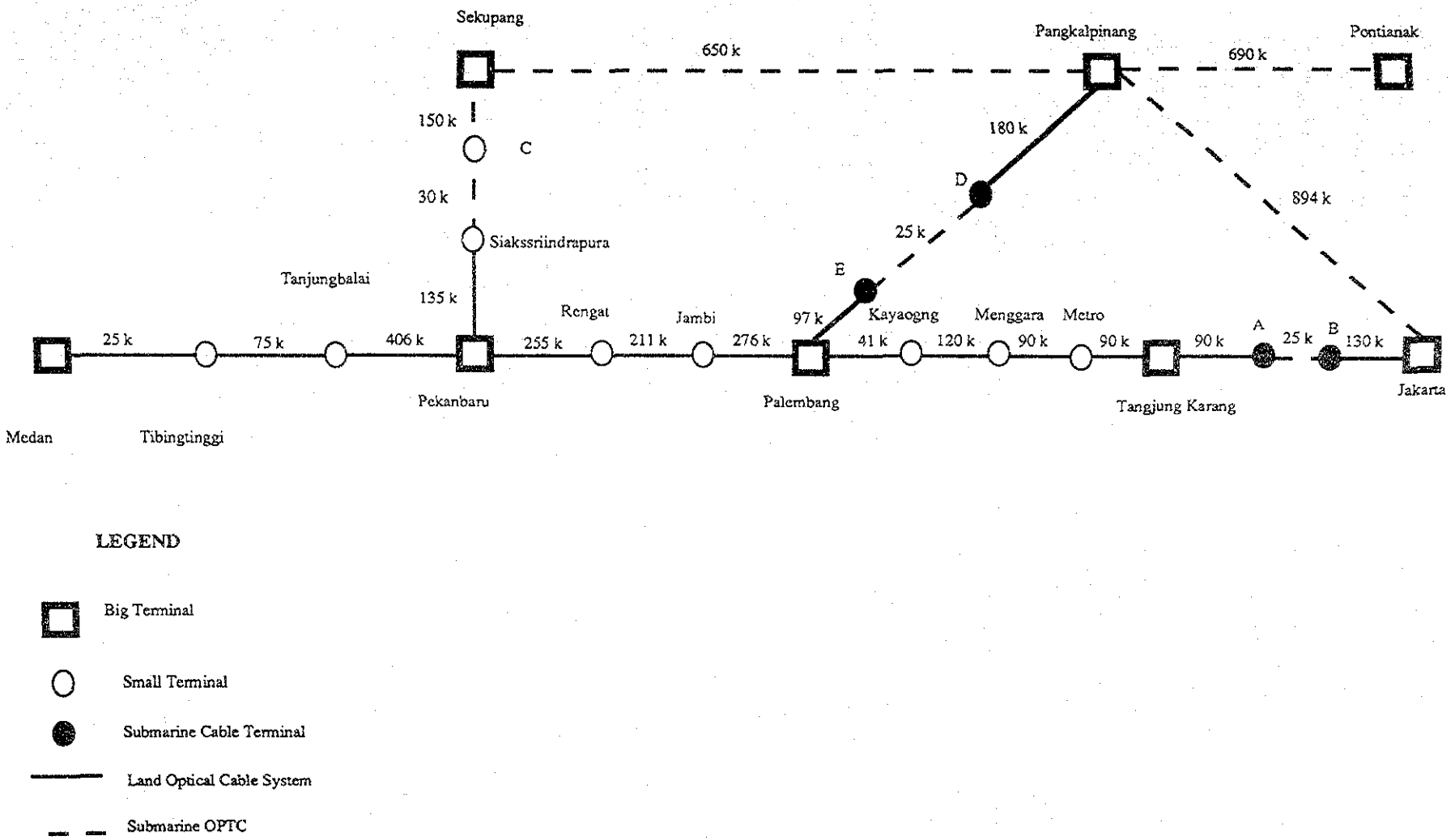


Figure 8.2.2 Basic Design of Optical Fiber Cable Structure in Sumatra Area

i) Floor space and power supply will be prepared by the plant in the existing exchange or transmission centers or other projects

8.2.6 Phasing

Now in Sumatra Island, only microwave transmission systems are existing, and the capacity is expected to be acceptable until around 1998 based on the telecommunication network development plan for Repelita VI.

8.2.7 Cost Estimation

Initial cost (excluding US$ 500,000 for feasibility study) is estimated as follows:

Project Part 1 (ground route)	:	US$	88,944,000
Project Part 2 (submarine route)	:	US$	192,830,000
Total cost	:	US$	281,774,000

8.2.8 Appraisal

(1) Technical

It is advanced technology using digital technic. This field is progressing very quickly. In the future, fiber optic system will become cheaper than today. But in this study, we adopted today's technical and cost condition.

(2) Economic

1) The new transmission system is essential in this area.
2) It needs to select cheapest system. It is sure that fiber optic system is cheapest one in the future.
3) Based on the report on the Telecommunication Development Plan Repelita VI, the IRR is estimated about 20% (see Appendix A8.2).
4) It means there is some profit in this system.

8.2.9 Major Preconditions and Recommendations

(1) The biggest precondition is road construction. We heard that on this route on the land, new road is under construction and it will be completed by the year 2000. But if the road construction will be postponed, the schedule must be put off too.

(2) Therefore feasibility study must be done at first and coordination with a road management section of the government is essential.

Appendix A8.2 Financial Evaluation of Fiber Optic System in Sumatra Area

The Calculation of IRR of this Project :

- IRR of this project is estimated about 20%
- It is assumed that the equipment cost is today's one, but the assumption of the construction year is 1999.
- The annual increasing ratio of cost is 10%
- But the cost of equipment is no inflation
- The demand forecast of WITEL-I,II and III is got from the report of another JICA Team "THE STUDY ON TELECOMMUNICATION NETWORK DEVELOPMENT PLAN FOR REPELITA VI"
- It is assumed as follows :

1) The refunding time of this system is 15 years

2) Traffic passing in these routes is calculated as follows

   a) Calling rate is 0.072 (from NTT SCR study team survey in August 1992)
   This is busy hour traffic and traffic concentration ratio is 0.11
   b) Successful call ratio is 50% (expecting that after 2000, it will be improved to 50%)
   c) Trunk call ratio of originating call is 13.9% (ditto)
   d) 1/2 of (c) is path through these new routes.

3) The income from call charge is calculated as follows;

   a) The distance among each cities is more than 200km
   1 unit charge timing of a call is;
   every 4 seconds for 200km to 300km
   (such as Palembang to Bandar Lampung)
   every 3 seconds for 300km to 1000km
   (such as Palembang to Jakarta)
   every 2 seconds for more than 1000km
   (such as Medan to Jakarta)
   Therefore, average of 1 unit charge timing is assumed 3 seconds in this study.
   b) The price of 1 unit charge is Rp.100
   c) It is assumed that the income for this project is about 16% of the total income because the investment cost ratio for backbone transmission equipment against investment cost for total network equipment is about 16%.
   d) US$ 1.0 = Rp. 2,000.

4) The calculation is shown in next pages.

Table 8.2.1 IRR of Optical Fiber Cable System in Sumatra Area No.1

Unit:US$ 1,000

	Year	1998	1999	2000 $ in	2001	2002	2003
	Year After $ In			1	2	3	4
Demand	WITEL I	458,000	499,600	541,200	582,800	624,400	666,000
	WITEL II	244,000	266,200	288,400	310,600	332,800	355,000
	WITEL III	417,000	454,600	492,200	529,800	567,400	605,000
	Total Demand of WITEL I,II,III	1,119,000	1,220,400	1,321,800	1,423,200	1,524,600	1,626,000
Traffic Demand	Estimated Traffic Flow in This Route		4,971	5,384	5,797	6,210	6,623
	Necessary units of 622 Mb/s(8064ch)		4	4	5	5	5
Investment	Subtotal		281,974	0	0	0	0
	Cost of Ground Route		88,944				
	Cost of Sea Route		192,830				
	12 Viecles		200				
Operation Cost	Subtotal			581	610	640	672
	Wage(100 persons)			438	460	483	507
	Viecle Maintenance			60	63	66	69
	Office Utility			10	11	11	12
	Expendable Cost			10	11	11	12
	Miscellaneous			10	11	11	12
	Contingency(10% of OP cost)			53	55	58	61
Operating Income	Subtotal of Operating Income			46,988	50,593	54,197	57,802
	Call Charge			46,988	50,593	54,197	57,802
Cash Flow	Cash Inflow		0	46,988	50,593	54,197	57,802
(without	Cash Outflow		281,974	581	610	640	672
capital loan)	Total Cash Flow and Remaining Value		-281,974	46,407	49,983	53,557	57,129
IRR	FIRR(15 years)	0.209					
	Expecting Ratio of FIRR		0.200				

In this study, there is no remaining value after depreciation, because there is no thing to use again in Optical fiber Cable buried under ground.

Fig 8.2.1 IRR of Optical Fiber Cable System in Sumatra Area No.2

Unit:US$ 1,000

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
5	6	7	8	9	10	11	12	13	14	15
722,600	779,200	835,800	892,400	949,000	1,005,600	1,062,200	1,118,800	1,175,400	1,232,000	1,288,600
385,000	415,000	445,000	475,000	505,000	535,000	565,000	595,000	625,000	655,000	685,000
656,400	707,800	759,200	810,600	862,000	913,400	964,800	1,016,200	1,067,600	1,119,000	1,170,400
1,764,000	1,902,000	2,040,000	2,178,000	2,316,000	2,454,000	2,592,000	2,730,000	2,868,000	3,006,000	3,144,000
7,185	7,747	8,309	8,872	9,434	9,996	10,558	11,120	11,682	12,244	12,806
5	6	6	7	7	7	8	8	8	9	9
0	0	0	0	0	0	0	0	0	0	0
706	741	778	817	858	901	946	993	1,043	1,095	1,150
532	559	587	616	647	679	713	749	787	826	867
73	77	80	84	89	93	98	103	108	113	119
12	13	13	14	15	16	16	17	18	19	20
12	13	13	14	15	16	16	17	18	19	20
12	13	13	14	15	16	16	17	18	19	20
64	67	71	74	78	82	86	90	95	100	105
62,707	67,613	72,519	77,424	82,330	87,236	92,141	97,047	101,953	106,859	111,764
62,707	67,613	72,519	77,424	82,330	87,236	92,141	97,047	101,953	106,859	111,764
62,707	67,613	72,519	77,424	82,330	87,236	92,141	97,047	101,953	106,859	111,764
706	741	778	817	858	901	946	993	1,043	1,095	1,150
62,001	66,872	71,740	76,607	81,472	86,335	91,195	96,054	100,910	105,763	110,614

9. URBAN AND RURAL DEVELOPMENT

9.1 PALEMBANG KAMPUNG DEVELOPMENT PROGRAM

9.1.1 Project Background and Objectives of the Project

The main objective of the project is to improve the living conditions of people who live in kampungs (neighborhoods) in Palembang through betterment of the physical environment, while offering informal education and training for better and market-oriented skills to get employment opportunities and higher income, and providing a credit scheme. To achieve this effectively, people's participation through self-help groups should be promoted. Concretely, this program consists of a Kampung Improvement Program for improving physical conditions, a Human Resource Development Project for upgrading education and skill levels, Credit Union Project for expanding small business for people in kampungs. They are all based on people's participation. The role of this program in the regional development is to enhance the productivity of people, which can contribute to the economy as a whole.

There are many kampungs in Palembang, of which many are highly congested and physical conditions are deteriorated. So far Palembang has executed Kampung Improvement Program (KIP), starting in 1981 for 67 kelurahans with the total cost of about Rp.2 billion. It aims to stimulate the people to work together to care for and develop their environment, and to improve the levels of health and income indirectly. However they are still not enough in terms of the coverage and components. There is review of KIP done by BPS and BAPPEDA TK.I. The positive effects mainly come from the improved paths, for example, muddy/wet pathways are now dry, traders/peddlers can enter urban neighborhoods, communication within neighborhoods is better, and people may be encouraged to use urban services like Puskesmas when access is better. On the other hand, there are some negative effects or little positive impact. This is the case for MCK (public place for washing, bathing and toilet) and rubbish systems, etc. For instance, MCK are badly designed in terms of the location and technical matters, and MCK do not work because of the lack of water. For rubbish cats, people are not informed well of the operation system. According to this review, the problem has been too much top down planning and a program needs to involve localism for design of facilities to suit local and geographic conditions specific to each area, and needs to discuss planning with people from the beginning and arrange eventual management between them. In this Kampung Development Program, we try to enhance people's participation to identify their real needs and demands, to decide the location for water pipe, community toilet, foot path to be improved, to make an appropriate design, and maintain improved environment by themselves.

In many Indonesian kampung, there are informal self-help activities organized by the people themselves. One type is activities to keep clean environment, another type is to improve social welfare by themselves such as arisan (a club to borrow and save money) and religious groups which function not only as religious groups but as saving and credit vehicles. It is appropriate to identify and use local organizations to realize people's participation, since those local organizations reflect members' needs they can function for hearing people's needs and demands, disseminating information, increasing people's awareness, and mobilizing self-help effort to create and keep a clean kampung. There are also formal organizations like PKK, and as far as they function well, either formal or informal group may work for our purpose.

In social economic terms, many people in Palembang rely on the so-called informal sector ranging from trade, home industries, transport, repair, to scavenging and so on. Many of them work near their home concentrated in the center of the city because of the nature of their work. Since formal sector cannot absorb all labor force because of the limited number of employment opportunities and low level of skills of people, informal sector is a complementary alternative to the formal sector for many people. Informal sector currently not only absorbs unemployment labor force but contributes to the economy, producing and marketing of products made by small-scale industries, home industries both informal and formal sectors, giving cheap transportation, and services. The relation between formal and

informal sectors is interdependent and complementary. Informal sector keeps up with the growth of formal sector's activities. Formal sector also relies on informal sector, for example, low wage employees need to get food and/or other commodities, services and transportation.

In view of this reality it is important not only to directly improve the physical conditions of living environment but also to enhance human resources for better lives and overall economy through skill training and to promote entrepreneurship from bottom to up through provision of credit. These can transfer human resources from informal to formal sector and/or entrepreneur can become formal activities, while it is also important to admit the existence of informal sector to secure their employment opportunities and income.

9.1.2 Location

Some kampungs in Palembang City. The exact location and target population will be decided after the survey in the first phase.

9.1.3 Executing Agency

1) Kotamadya Palembang
2) Ministry of Public Works
3) Ministry of Industry
4) Bank Indonesia

9.1.4 Expected Benefits

(1) Basic Needs Fulfillment

One component of Kampung Development Program, Kampung Improvement Program, will fulfill and improve basic needs such as water supply, sanitation, stable foot path, and waste disposal. This will directly affect physical condition, for instance, realize cleaner environment, ease the burden of fetching water, and offer safe access roads. It can also indirectly influence health condition, for instance reduction of water-related diseases caused by water quality, water insufficiency, and insect vector like malaria, through improved physical conditions, therefore it can improve welfare and productivity of people living there.

(2) Human Resource Development

Another component, human resource development, will develop market-oriented skills of people. Because of the better skill, 1) people can produce products in better quality and high demand, and in more efficient and effective way, 2) some of the small business may become a formal enterprise through enlarging its business and with people with higher skills, 3) some of the people may have chance to enter formal enterprise. Thus this component can contribute to poverty alleviation, higher income, employment creation, and more active economic activity as a whole.

(3) Access to Credit Scheme

The provision of credit scheme to small scale business is essential for them to grow. When people involved in informal sector need some money for investment, they have to rely on their relatives, friends, leader of their work place, and private money lenders with high interest rate. That small-scale and/or home industry businesses have access to credit will have an opportunity to invest for bigger and market-oriented business. This will contribute to income increase and support for economic activity.

(4) Bigger Positive Effects through People's Participation

What should be emphasized is that this program should be based on people's needs and demands through their participation, therefore the impacts of the program are

expected to be stronger, more effective and sustainable. As a review on KIP has revealed, KIP has been too much top down in approach in Palembang and it has failed to consider people's needs therefore people do not use a newly built MCK, etc. The approach should be more bottom up so that the program can meet people's needs. The idea is the same for human resource development and a credit union. It should meet people's needs and demands. By forming a group, people can express their idea and can be mobilized each other, assisted by facilitators in the first place. In case of credit union it requires well-organized group. We need to inform them and discuss with them from the planning to be effective.

Kampung Development Program thus includes improvement of physical condition, human resource development, and access to credit scheme for small business, which will contribute to overall social and economic development. They can be carried out effectively with people's participation.

9.1.5 Outline of the Program

(1) Kampung Improvement Program

Kampung Improvement Program (KIP) is a relatively old program with a 20 year history nation-wide. Its objective is to upgrade the physical conditions of Kampung, including water supply, sanitation, drainage, foot path, and solid waste disposal. Palembang city implemented Kampung Improvement Program in the past and will continue the program. This project will complement the existing KIP with the emphasis on community-based approach, meaning based on community needs and people's participation from planning to maintaining improved condition. We utilize an existing either formal or informal local group, or will form one if there is no functioning group. The group is expected to listen to people's needs and demands, increase people's awareness and motivation for improving their surrounding conditions, mobilizing labor for implementation and maintenance. Women have an important role like being managers of urban environment. Therefore the components and location should be decided by both felt needs by the people (both men and women) and by objective judge, for instance, the community needs water supply since they use polluted water.

In this project we recommend support for the scavenging system for solid waste disposal. Scavenging system requires local people for collecting waste, separating them, and carrying them to bigger collection site, and then dump sites. Basically there are two types of garbage, organic and inorganic wastes. For organic waste, scavengers can produce compost to sell. For inorganic waste, other groups of scavengers separate rubbish to several categories, such as metal, glass, paper, textile, plastics, and so on for market. For this process, hundreds of scavengers can be employed. Scavenger system thus can contribute to creating employment opportunities, recycling of solid waste, and cleaner environment. This system can be and should be expanded to areas in the city other than kampungs.

(2) Human Resource Development

This project aims to increase people's ability and skills for better social and economic condition. People in Kampung have created many kinds of products and jobs in both formal and informal sector, home industry such as fruits cake and fish crackers, small-scale industry such as small furniture and materials made of nipa tree, trade of many kinds of foods and commodities, service like repair, transportation like becak, and so on. Their skills are generally low and education level of many people also low. They do not know what is in demand. Therefore it is imperative to give them informal education and skill training. This sub-program will motivate people to improve education level and skills with the cooperation of NGO which is expected to strengthen local groups and motivate people.

(3) Credit Union

This project aims to offer access to credit to people. If people have cooperatives, they have an opportunity to get credit, however, if they do not have one, in many cases they

have to take procedures for getting credit from a bank as an individual which requires collateral. In this project, we propose the established project called Linking Banks and Self-Help Groups, which is promoted by Bank Indonesia. In this project, a scheme of blocked saving and joint liability in a commercial bank is promoted. By forming a group and make a group saving, it reduces the transaction cost, which is usually high for small size transaction, at the same time those group savings become partial collateral. What people need is to form a group as a credit union. There are two types of credit scheme, one is direct credit from a bank to a credit union, another is indirect credit through NGO to a credit union. For the first type, a credit union may get assistance from NGO of guidance and consultancy, training for their business, and recommendations to the bank. In the second type, NGO (it can be a governmental organization) is an intermediary. If the ability of a credit union is still weak, the second type may be desirable. It should be emphasized that women can get access to credit, too.

9.1.6 Phasing

(1) Kampung Improvement Program

1) The First Phase

In the first stage selection of NGO and/or university and situation survey will be done. This will take two months. Desirably, it starts in the beginning of the fiscal year 1993. This includes following matters:

a) Selection of NGO or university, and consultant

To do survey and organize or strengthen local groups, NGO or university will be selected. NGO or university can be joint team. Those which have the similar experience, such as survey, community organization, training, and finance should be chosen. At the same time civil engineering consultant will be selected for survey of physical conditions and design of projects.

b) Physical condition

Water supply (number and location of water pipes if any, where to fetch water, and how long it takes to fetch water), sanitation (number and location of public toilets, if not what is alternative), drainage channels (length and their condition), road (types, length and condition), solid waste (where to collect and/or throw away).

c) Demographic situation

Population data which is disaggregated by gender, including seasonal residents, population density, their origin, age of residents, etc.

d) Socio-economic situation

Occupation composition, education level and income level by occupation, gender, and age, land own status (including land necessary to be acquired), etc.

2) The Second Phase

The second stage will take six months, desirably starting in the year 1993. This phase includes the following matters:

a) Selection of kampungs and their further profile

After the survey, the kampungs for improvement will be decided. Then we will continue searching to get the further profile of the kampungs by questionnaires and interview for demographic and socio-economic situation. This is done by selected NGO.

b) Identification and/or promotion of local self-help group

Identification of formal and/or informal groups which are functioning will be done. If there is none, forming a self-help group will be promoted and motivated. For Kampung Improvement Program, a self-help group can be loose. Identification of local self-help groups and promotion of forming a group can be carried out in line with those situation survey by NGO.

c) Consultation with people

This involves discussion with people which will be done by NGO. NGO is expected to motivate people and help people to formulate their problems and needs. They also need to discuss how they can contribute to building and maintaining the projects. This can include social marketing which demonstrate that people can realize better physical environment if they want and try.

d) Selection of the program component and location

It is required to discuss with people about components, location, design of the activities. Criteria of priority of project components should be judged from people's needs and objective needs like they need clean water from the view point of hygiene for improvement.

e) Design of projects

Projects design should be simple and appropriate to people's needs and convenience to utilize local groups to implement and manage.

f) Decision of the management system

Special arrangements are necessary for the scavenging system. This is done with discussion among local government, technical consultants and NGO, and the scavengers. Recommended scavenging system is that scavengers collect and sort waste, carrying them to bigger collection site, and then dump sites. To sort garbage, organic and inorganic wastes are distinguished. Scavengers can produce compost from organic waste to sell. For inorganic waste scavengers separate rubbish to several categories, such as metal, glass, paper, textile, plastics, and so on for market. For other basic infrastructure, self-help groups should discuss and decide how to maintain the drainage, public toilets, water pipe, etc. with the consultation by NGO and/or university.

3) The Third Phase

The third stage is implementation mainly with the manpower of local people. The projects will be implemented over a period of five years, starting in 1994. The exact locations and number of components will be decided in the second stage.

4) The Fourth Phase

The fourth stage is operation and maintenance using mechanisms developed in earlier stages.

(2) Human Resource Development

1) The First Phase

The first stage includes selection of NGO and/or university and situation survey. This will take three months. Except market research, this stage is the same as Kampung Improvement Program with some addition of the contents of survey. It is desirable to start in the beginning of fiscal year 1993. This includes following matters:

a) Selection of NGO or university

To do survey and organize or reinforce local groups, NGO, university, or consultant firm is selected. Those which have the similar experience should be engaged. This is basically the same process as Kampung Improvement Program.

b) Demographic situation

Population data which is disaggregated by gender, including seasonal residents, population density, their origin, age of residents, etc.

c) Socio-economic situation

Occupation composition, education level, knowledge and income level by occupation, gender, and age, working hours, work days in a week, locations of their job, people's potential, etc. Survey on existing training system is included.

d) Market research

Market research for what kind of productions and skills are in demand and useful in the local market and economy. Market-oriented products and skills should be promoted.

2) The Second Phase

The second stage will take six months at the same time as Kampung Improvement Program, desirably starting in the year 1993. This phase includes the following matters:

a) Selection of target people and their further profile

After the survey, we will decide the target population for informal education and training. Then we will continue searching to get the profile of the target population by questionnaires and interview for demographic and socio-economic situation. This is done by selected NGO.

b) Identification and/or promotion of local self-group

Identification of formal and/or informal groups which are functioning will be done. If there is none, forming a self-help group will be promoted. This group can be the same as one for Kampung Improvement Program. A local group is important for human resource development, too. It can know what people need and induce people's mobilization and potential, while

keeping the common aim of getting their lives better and realizing self reliance. The leader of the group has a role to hear the members' voice and/or monitor the learning process and results of training for feedback. Identification of local self-group can be carried out in line with those situation survey by NGO.

c) Social preparation and consultation with people

This involves the process of setting objectives and goals of the group, and operational matters including deciding on personnel, management and administrative systems. Thorough consultation and discussion with people about the organization should be done by the NGO. NGO is expected to motivate people and help people to formulate their problems and needs to improve their social economic status. They also need to discuss why the education and training are necessary, and the contents of education and training.

d) Informal education

Complementary education to formal education and applied education is desirable if people's education level is too low, so that people can get basic knowledge like calculus, etc.

e) Contents of training

Contents of training are decided after identification of people's needs, potential and marketing potential. Possibly it includes skill training for production and repairing such as radio and TV technicians, welding, electricity installations, motorcycle technicians; skill training for small and home industry such as small furniture making, carpenters, tailors, home made (fruits) cakes, fish crackers; skill training for desk work such as typing, simple accounting, management, preparing a contract, and so on.

f) Staffs for training

The local government and/or several ministries, such as Ministries of Industry, Trade, Manpower, Social Affairs, and Home Affairs, have a system for extension service. It is one way to ask those experts for training. People in the private sector and university students can help training, too.

g) Setting the time and location for training

The working hours of people in informal sector are usually long from early morning to evening. It is difficult to set the fixed time during the day time for training. During the research, we will find out the better time for training. To decide the location for training, NGO/university to decide as part of initial survey. In some kampungs there may be facilities made by the government, for example, "common service facilities" in kampung, which is made by Ministry of Industry as public work place with tools to share, and as a place for extension service for one type of job which can cover one to several kampungs. It is convenient to utilize those existing facilities.

h) Monitoring and feed back system

It is necessary to set up the system of regular monitoring, evaluation and feed back system for effective education and training and for keeping people's motivation to learn.

3) The Third Phase

In the third stage training will start. The training will last for a period of five years. It can start in 1994. The contents of education and training will be decided in the second stage. The third stage involves supervision, evaluation, and feed back.

(3) Credit Union

1) The First Phase

The first stage includes selection of NGO and/or university and situation survey. This will take two months. This stage is basically the same as Human Resource Development Program with some addition of the contents of survey especially for potential of money lenders. It is desirable to start in the beginning of fiscal year 1993. This includes following matters:

a) Selection of NGO or university

To do survey and organize or strengthen local groups, NGO, university, or consultant is selected. Those which have the similar experience should be engaged. This is basically the same process as other two projects. NGO with the knowledge and experience of working with a credit union is desirable.

b) Socio-economic situation

Occupation composition, education level and income level by occupation, gender, and age, working hours and work days in a week, month and year, locations of their job, current source of money to borrow, interest rate to borrow, potential of people's business to grow, etc.

c) Market research

Research for what kind of business are promising and for potential of small business which people in kampungs are involved. At the same time it is important to inquire the system that money borrowers return the money effectively.

2) The Second Phase

The second stage will take six months at the same time as other two projects, desirably starting in the year 1993. This phase includes the following matters:

a) Selection of target people and their further profile

After the survey, we will decide the target population as a credit union. Then we will continue searching to get the profile of the target population by questionnaires and interview for demographic and socio-economic situation. This is the same procedure as Human Resource Development and done by selected NGO.

b) Identification and/or promotion of local self-group

Identification of formal and/or informal groups which can function as a credit union will be done. If there is none, forming a self-help group will be promoted. This group for a credit union may be the same as one for

Human Resource Development, since a credit union may consist of the people of the same work place. The leader has a role to hear the members' voice on the saving for feedback and spread the information on borrowing procedures. Identification of local self-groups can be carried out in line with those situation survey by NGO.

c) Social preparation and organization of credit union

This involves the process of setting objectives and goal of the group, and operational matter including deciding personnel, management and administrative system. Thorough consultation and discussion with people about the organization should be done by NGO. NGO is expected to motivate people and induce people's idea of what they need to improve their social economic status. They also need to discuss about how to invest, saving and credit scheme, management during the process of returning money.

d) Consultation for operation and management by NGO for a credit union

NGO has a big role in this project for consultation. In the proposed "Linking Banks and Self-Help Groups project", NGO has two roles. In the first type which is a direct credit from a bank to a credit union, NGO may assist guidance and consultancy, training for self-help groups, and recommendations to the bank. In the second type in which NGO is an intermediary between a bank and credit union, the roles of NGO include group guidance and extension services, examining the credit worthiness of a credit union, financial training, depositing the saving of a credit union and obtaining a bank loan as a financial wholesaler for the credit union, and repaying the loan.

3) The Third Phase

In this stage self-help groups will start block savings and get access to credit with the assistance of NGO. NGO has a role to monitor the credit system as a whole to sustain the credit union and make the necessary changes.

9.1.7 Cost Estimation

Since the implementation of this program is based on the situation survey in the first stage and decision of the exact locations and target population, implementation cost is to be decided after the second stage.

Cost for employing NGO/university staffs and consulting service for technical assistance in the first and second stages are estimated as follows:

NGO	national NGO	US$50,000
Consultant	local civil engineering	US$20,000
Others (inputs, etc)		US$10,000
Total		US$80,000

For reference, very rough estimate for implementation of Kampung Improvement Program is about Rp. 8 million/ha and poor areas are calculated as about 450 ha in Palembang city. For training facilities one Common Service Facilities costs about Rp. 400 million, and there is no cost for establishing a credit union except technical assistance since money to save comes from people themselves.

9.1.8 Appraisal

Since this program needs to be designed later before implementation, cost cannot be estimated. Therefore financial and economic appraisal cannot be done in this stage. The main economic benefit after implementation is the increase of employment opportunities and income of people living in the kampung through skill training and access to credit, and more active economic activities by expansion of their business. The social benefits are improvement of living environment, which can contribute to higher productivity of people, and increase of participation by people, which can lead to more effective, efficient, and sustainable projects and overall development activities.

9.1.9 Major Preconditions and Recommendations

This program consists of three components, however, decision of implementing each component depends on the needs of a kampung. A kampung does not necessarily require all three components. Regarding the phasing, if a kampung requires all three components, they are not necessarily carried out simultaneously, rather it depends on their absorptive capacity. It may be good to start human resource development project and credit scheme project after Kampung Improvement Program, since the latter do not require a well-formed group and it may be good to start and get used to group activities. The self-help group for Human Resource Development and Credit Union may be the same and they reinforce each other in nature, for example, when people get access to credit for investment, they need better skills to produce more goods of better quality so that they can pay back the money from their profits. Therefore it is better to carry out them at the same time or at least sequentially without the interim. Those judgement will be done during the research in the first and second stages according to people's needs and their capacity, and it is better to leave it flexible.

At present The Asian Development Bank has a plan for Kampung Improvement Program. Although they say people's participation is important, it seems they have not yet taken necessary measures for it according to the report. Our program can complement the Bank's project, since our research emphasizes people's participation and needs, and the Bank's survey on physical condition can complement our research. Beside it the Bank's report recommends social and economic development for people in kampung, therefore our proposed research is expected to reinforce the Bank's idea.

9.2 LAMPUNG UTARA PARTICIPATORY RURAL DEVELOPMENT PROGRAM

9.2.1 Objectives of the Project and Its Role in the Regional Development

The main objective of the project is to increase incomes and living standards of farmers by identifying suitable and sustainable farming systems to increase production, introducing skill training of various business for women, providing a credit scheme, and improving rural infrastructure, all of which are based on farmers' participation by NGO's support. Target people are poorer farmers and poorer women. The targeted area, Kecamatan Blambangan Umpu, is defined as one of the poorest kecamatan by BANGDES (Directorate General of Rural Development in Ministry of Home Affairs). The targeted farmers are mainly local transmigrants, the majority of whom have to obtain temporary off-farm employment because they cannot survive only with on-farm income owing to poor soil fertility. Original farmers who have the similar problems are also included. Those who do not have land title will be encouraged to register their land with the assistance of NGO.

This program consists of agricultural research and extension, skill trainings for women, provision of credit, and rural infrastructure. To realize farmers' participation in those projects, farmers' groups should be established and/or strengthened. In this program NGO has a role to support those farmers' organizations and assist them, especially poorer farmers' groups, to participate in projects effectively. The first component of the program aims to

identify environmentally sound and suitable production mixes in the area and to improve the productivity of farmers. To identify and spread knowledge of those suitable production and skills to farmers, we will invite sarjanas (university graduates who have a will to work in the fields) in addition to consultants, extension service staff, and field workers of BANGDES. They also teach basic education to low-educated farmers, especially women. By involving the sarjanas, they can get practical knowledges, skills and experience. The program includes a credit scheme for farmers to obtain capital for investment, and basic infrastructure such as rural roads for better access to markets and necessary facilities. Female farmers should participate in these components of the program. Besides, the program includes "women in development: WID" components, that is, skill training for women. This component aims to increase women's skills in various business activities such as food processing and marketing. It also aims to improve women's education level. Women with those skills have access to credit which is the second component to start and expand their business. The role of this program in the regional development is to become a model project of participatory rural development program to replicate in other areas, and also to stimulate local economy through increased production.

The basic idea is that those development efforts should be done with farmers' participation. Participation of farmers can make development projects more effective, efficient, and sustainable. It is also possible to reach and include poorer farmers who tend to be excluded from conventional agricultural services. Farmers' participation should be realized at every level after they are selected up to monitoring and evaluation of the project. To achieve participatory approach effectively, a farmers' group needs to be organized and/or promoted with the cooperation of NGO. Most Indonesian desas have kelompok tani (farmers' group), therefore it is appropriate to identify and utilize those farmers' groups to realize farmers' participation. At the same time, however, it is necessary to identify problems and constraints in the group, for instance, whether there is power structure against poorer farmers in the group, and how to increase women's involvement since many farmers' groups consist of only men. Therefore it is desirable to form a new farmers' group to realize disadvantaged farmers' and female farmers' participation. Since women have a big role for agricultural production, their participation in the program should be emphasized. It may be useful to involve formal organizations like PKK (women's group) to reflect women's voices, however, we need to investigate whether PKK reflects poorer women's real needs and if necessary to identify the effective way to reach poorer female farmers. Women groups can participate in both agricultural extension activities and the training of other business activities, if they want.

For participatory rural development, there are major roles for farmers' organizations and the NGO's roles to support farmers. The roles of NGO are as follows:

1) to conduct overall survey, including land ownership status so that they can assist farmers without a land title in registering their lands to the agencies concerned;
2) to identify existing groups, constraints and problems of the groups;
3) to identify smaller, poorer, disadvantaged farmers, including female farmers;
4) listen to the voices and ideas of farmers and discuss with many varieties of farmers such as richer, poorer, farmers in remote areas, female farmers, etc. to understand their problems, needs, and demand;
5) to organize groups for small farmers and/or women's groups;
6) strengthen farmers' groups through training to function to work together, to mobilize each other, to participate in the project such as receiving training and information, getting access to credit, and so on;
7) to discuss with sarjanas, consultants, extension workers, and local governments about the situation and the current absorptive ability of farmers' organizations, so that the projects meet farmers' needs and ability;
8) to assist field workers in BANGDES in formulating skill training programs for women;
9) monitor and evaluate the function of farmers' organizations;

10) provide training to get credit for farmers' groups, including group and/or individual guidance and consultancy for necessary procedures and recommendations to the bank, examining the credit worthiness of farmers' group in case of a credit union, financial training, and so on.

Since the NGO's roles are important and influence the result of the project, funding agency to implement this program should be careful to select NGO by clear criteria. Those criteria include experience in working with farmers groups, experience in similar environment, experience in working with a local government, financial knowledge and experience in small-scale credit, strong management, etc.

The relationship among NGO, farmers' organizations, sarjanas, consultants, extension services and field workers is delineated in Figure 9.2.1.

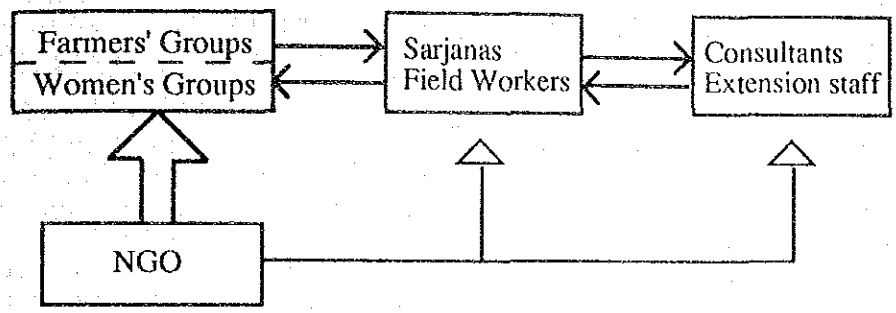


Figure 9.2.1

9.2.2 Location

Kecamatan Blambangan Umpu in Kabupaten Lampung Utara.

9.2.3 Executing Agency

BANGDES as an executing agency, with the cooperation of Ministry of Agriculture, Ministry of Public Works, Ministry of Youth and Sports, and Bank Indonesia. Organizational structure for the program is shown in Figure 9.2.2.

9.2.4 Expected Benefits

(1) Increase of Farmers' Income

The soil condition of targeted areas is not good and many farmers have to rely on off-farm work to survive. According to farmers soil fertility is declining. By sarjana working together with farmers (including female farmers) and later PPL (extension service staff) and consultants joining, farmers can find out the suitable mix of production and select the option. By providing farmers with a credit scheme, they can get the necessary inputs for these production. Credit schemes can motivate farmers to try to invest and enable them to produce more suitable crops. Those components will contribute to sustainable agricultural production and increase of farmers' productivity and income.

(2) Increase of Women's Social and Economic Condition

By incorporating WID approach into the program, women have access to training of various business skills and to credit, which can contribute to improvement of women's skills and income. It will also lead to raising their self-confidence to help themselves.

(3) Identification of Environmentally Sustainable Production

This program tries to test various production so that farmers can find out sustainable agricultural production. The environmental aspect should be always taken into consideration including the period of the research. Thus they can identify the appropriate production mix to the area, which is environmentally sustainable.

(4) Improvement of Skills of Sarjana

Through trying various products by themselves and/or with farmers, and later getting advice from experts, sarjanas who have just finished university and started working in the fields can increase their knowledge, skills and experience. It is important for graduates to gain direct experience of rural village conditions, and to apply their technical knowledge to practical problems by working together with farmers. This program will contribute not only to enhancing their ability but also spreading new ideas and technical knowledge to farmers.

(5) Improvement of Rural Infrastructure

Many farmers lack transportation to markets, which makes it hard for them to sell, to get necessary farm inputs, and to reach storage and processing facilities. Where necessary, this program will make access roads and small bridges between farms and markets,

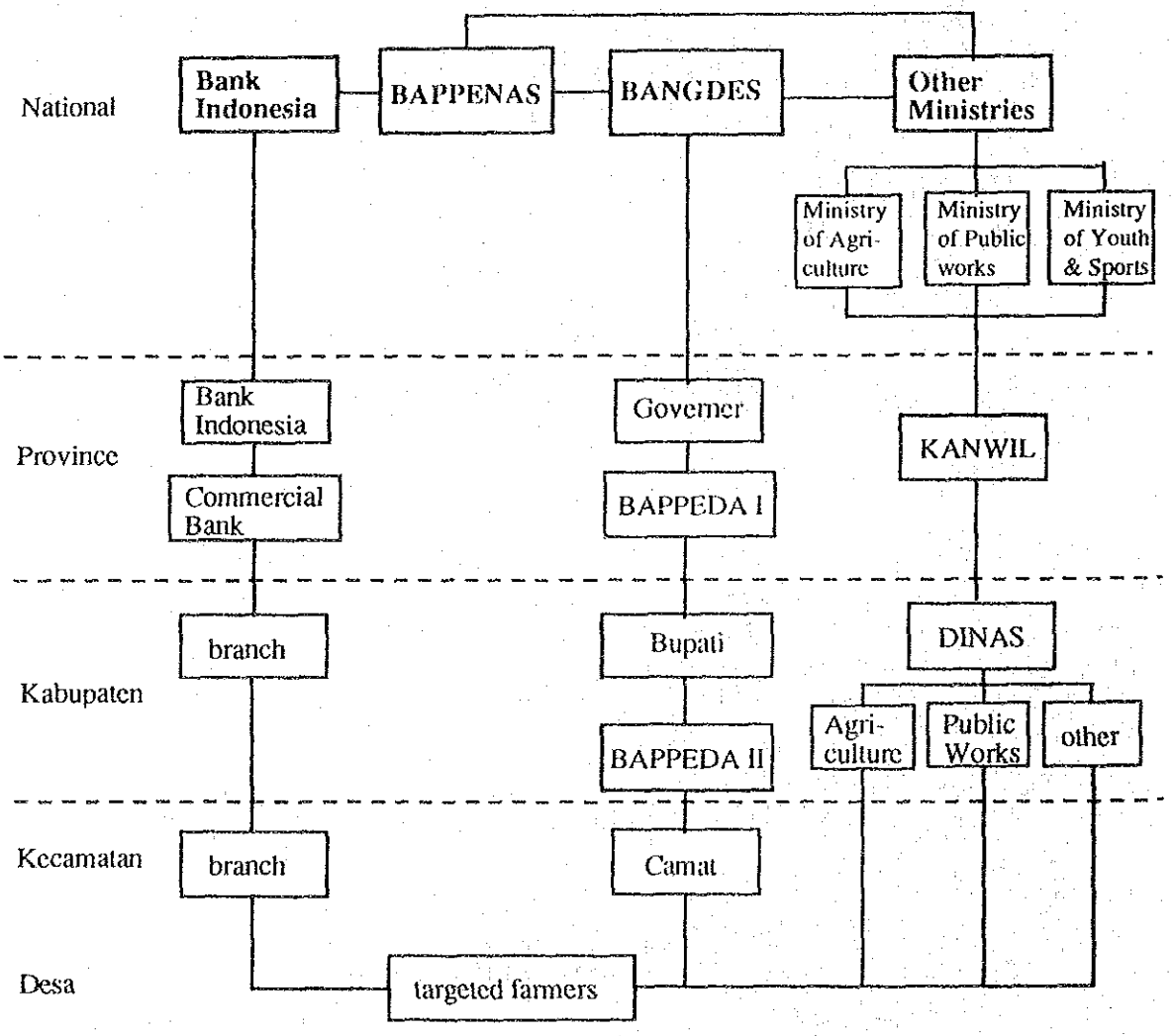


Figure 9.2.2 Organizational Structure for the Program

improve market, and make storage facilities in an identified rural town. Those facilities are expected to promote linkages between rural areas and other rural and/or urban areas. The basic infrastructure will also improve the access to economic and social services for farmers.

(6) Increase of Farmers' Participation

In this program, farmers' (both men and women) participation will be encouraged. The benefit of participation is generally to make the development effort more effective, efficient and sustainable after the projects are completed. For example, extension services has tended to be one-sided in top down approach, centrally controlled, and conducted by outsiders. It sometimes fails to gain the confidence of farmers, because extension staff do not listen to farmers but introduce unknown technology and products to them. Its coverage also tends to be limited to better-off farmers. On the contrary, participatory approach makes it possible to reach smaller and marginal farmers through small farmers' groups, thus increasing coverage. By listening to farmers and discussing with farmers, and showing some alternative methods and products so that farmers have a chance to select and test new ideas on their own farms, the projects ensure that farmers' ideas are integrated into project objectives and meet the farmers' needs. It can also help break down farmers' resistance to change. The farmers' organizations will be strengthened with the assistance of the NGO which has experience in organizing and training groups.

Participatory Rural Development Program whose components are agricultural research and extension, skill training for women, provision of credit, and improvement of rural infrastructure, based on participatory approach, is expected to contribute to the effective social and economic development in the rural area.

9.2.5 Outline of the Program

(1) Agriculture Research and Extension

In this project Sarjanas (university graduates) have a major role to work, try new production and/or mixture of various production with farmers as partners, and spread appropriate and environmentally sound agricultural products and methods to farmers groups including poorer farmers' groups. Sarjana will get land in some different places for research and testing, and this land will become pilot project sites. This research type of activities should be farmers participatory research, reorienting conventional extension practice with farmers' knowledge. Agriculture extension will also invite consultants with the speciality of soil and agriculture, environment, and extension service staffs from Ministry of Agriculture. Surveying the present situation, and trials and results of both sarjanas and farmers, they will test and identify a range of environmentally sound agricultural production options. Then they and sarjana are expected to spread alternative products and methods to farmers groups with the cooperation with NGO. It is desirable to show range of options so that farmers can choose the option most suited to conditions on their own farm.

Sarjanas also have a role to provide informal education to low-educated farmers, especially women. This includes basic literacy, numeracy, and other necessary training identified in the situation survey.

(2) Skill Training for Women

The component aims to provide skill training for women in food processing, poultry breeding, small scale industries, book keeping, marketing and other possible business activities. Women are also given basic education such as literacy and calculus. Skill training will be provided by field workers of BANGDES with NGO's cooperation. Sarjanas will give them basic education.

(3) Credit Scheme

This credit component intends to provide poorer farmers, with access to credit so that they can buy necessary inputs and/or women can start other types of business. A bank usually requires collateral like land for lending money. However, poor farmers who are spontaneous migrants, and original farmers often do not have land or land title, therefore they do not have access to credit. Even though farmers have land in transmigration sites, farmers often do not know the credit system, and some of them may be afraid that they will lose their land if the investment fails. For these reasons, farmers should have easier access to credit, advice about credit system, management of credit and what to invest. The NGO will play a major role here, giving guidance and training on the credit system and management. They will also consult with extension workers including sarjanas on what to invest and how much farmers can invest.

There are a few credit institutions. The major credit scheme is through Bank Rakyat Indonesia. However, this is on a commercial basis for profit making, therefore poor farmers do not have a chance to get credit from this scheme. One of the possible schemes for poorer farmers is the credit union, which is promoted by Bank Indonesia through a commercial bank. Farmers form a credit union and they can get credit through the union by making block savings in a bank. Another type is conducted by rural banks (Badan Kredit Desa) which are based in desa level. This is now promoted by BAPPENAS, and Bank Rakyat Indonesia supervises those rural banks. They do not require collateral but require savings to get credit. After careful examination of those credit schemes and farmers' credit worthiness, farmers will choose appropriate schemes with the advice of the NGO.

(4) Rural Infrastructure

This component aims to provide basic rural infrastructure including rural roads and small bridges for better access, water supply (public wells), market facilities, storage and processing facilities in a rural center. This includes identifying possible rural centers whose functions are 1) to improve the economic and social services in rural areas, 2) to develop an interlinked market system with other rural centers and cities, and 3) to spread the effects of development in cities to rural areas through strengthening linkages between urban and rural centers. These rural centers will be decided by determination of factors such as present centrality, present economic activities and potential for market centers.

9.2.6 Phasing

(1) The First Phase

During the first stage selection of NGO and sarjanas will be done. Then situation survey will carried out by NGO, which will take two months. Desirably, it starts in the beginning of the fiscal year 1994. The first stage includes following matters:

1) Selection of NGO, Sarjanas, and Consultants

To do survey and organize or reinforce local groups, NGO will be selected. It should have experiences of forming organizations and other experience and knowledge mentioned before, and there should be at least one financial expert for financial advice and provision of credit. Sarjanas will be selected by Ministry of Youth and Sports. Consultants with the speciality of soil, agriculture, environment and a civil engineer will also be selected. The selection of agricultural, soil and environment consultants will be completed prior to the end of the second stage.

2) Situation Survey

Existing rural infrastructure; demographic situation; population data which are disaggregated by gender and age; socio-economic situation; main economic activities; market research; education and income level; labor cycle to know labor

force availability for construction of rural infrastructure; land ownership status (including land necessary to be acquired for research and testing); identification of poorer farmers; power structure in a desa and a group; women's status, etc. Those survey will be done by the selected NGO and the civil engineering consultant will survey inventory of rural infrastructure, listening to farmers' ideas on necessary infrastructure liaisoning with the NGO, and plan possible rural centers and necessary investment to improve them.

(2) The Second Phase

The second stage is a preparatory stage and will include organization forming, social preparation, and sarjanas start to try the field work with participating farmers, which will take one year, desirably starting in the year 1994. During this stage, it is desirable to establish the system for farmers' participation, and the system of regular monitoring, evaluation and feedback. Farmers should have a role in the monitoring and evaluation system, too. This phase includes the following matters:

1) Selection of Desas and Farmers, and Their Further Profile

After the survey, the target desas and participating farmers (both men and women) will be decided. Further work in delineating the farmers' profile through questionnaires and interview will be done by the selected NGO.

2) Identification and/or Promotion of Farmers' Organizations

Identification of farmers groups will be carried out. If there are none, forming farmers' groups will be promoted and motivated. Female farmers' groups and poorer farmers' groups will be established. Identification of local self-groups and promotion of forming a group can be carried out in line with those situation survey by NGO through participatory observation.

3) Social Preparation and Discussion with Farmers by NGO

This involves the process of setting objectives and goals of the farmers' group, plans, and management and administrative systems with the assistance of NGO. The NGO is expected to motivate farmers to work in a group and to participate in the project. They also need to help farmers to formulate their problems and needs. Sarjanas will be also involved in this process to know about farmers' groups.

4) Sarjanas Working with Farmers for Farmers' Participatory Research

Sarjanas start working with farmers' groups, giving them advice and testing new forms of agricultural production, while listening to farmers' experience, ideas, needs and demands, which is a part of farmers' participatory research. They can motivate farmers to change their usual production and try new products with the cooperation of the NGO. They also give basic education to low-educated farmers, especially women.

5) Training for women

Field workers formulate training programs for women with the assistance of NGO. They also need to listen to women's needs and demands. They start giving training to women.

6) Setting up the System of Regular Monitoring, Evaluation and Feedback

It is necessary to set up the system of regular monitoring, evaluation and feed back for both the agricultural development work and the function of farmers' organizations. The former is done by Ministry of agriculture and the latter is done by NGO. The monitoring system should be a system in which the small farmers have a role and a voice.

(3) The Third Phase

The third stage involves implementation of rural infrastructure, and research and testing of agricultural production options by consultants and extension workers to identify suitable farming systems. During this stage provision of credit will start. This pilot stage will continue for three years, hopefully starting in 1995. During the implementation, monitoring and evaluation system will function and feed back should be supported to realize planned objectives of the program.

1) Involving Consultants with Farmers Participatory Research and Extension

After consultants survey experience and testings of sarjanas and farmers, soil conditions, environmental impacts, and physical potential and constraints, they are involved with experiments to identify the suitable products. Sarjanas are expected to function as a bridge between farmers and consultants so that farmers' voice and knowledge will be reflected in the experiments. NGO is also expected to support farmers' participation in the process of those activities. For extension service, consultants and PPL should prepare some alternative set of products. PPL and sarjanas are expected to spread those extension to farmers' groups.

2) Construction of Rural Infrastructure

The necessary investment will be decided based on the survey during the first stage, and construction will start with the labor force from the local area.

3) Provision of Credit

Since there are a few types of credit schemes, NGO should judge which system is more appropriate for the farmers' groups and/or to individual farmers.

(4) The Fourth Phase

The fourth stage is after the pilot project stage, and the farmers' groups are expected to be sustainable by themselves with the periodic but less frequent extension services of Ministry of Agriculture. A follow-up study will be necessary in this stage.

9.2.7 Cost Estimation

Since the implementation of this program is based on the situation survey in the first stage and decision of the desas and targeted farmers, implementation cost is to be decided after the second stage.

Cost for employing NGO and consultants for agriculture, soil and civil engineering are estimated as follows:

NGO	national NGO (20 months):	US$140,000
Consultants	international for agriculture (3 months):	US$66,000
	local for soil, agriculture, environment and civil engineering (10 months):	US$70,000
Others (vehicles & equipment, etc)		US$10,000
Total		US$286,000

9.2.8 Appraisal

Since this program needs to be designed in detail before implementation, cost cannot be estimated. Therefore financial and economic appraisal cannot be done in this stage. The main economic benefit after implementation is the increase of productivity of agriculture, farmers' on-farm income and living standards, especially poor farmers through participatory research and extension service, and credit provision. The social benefits are better access to economic and social services by improvement of rural infrastructure, better access to markets, which indirectly stimulates agricultural production, and identification of environmentally sustainable agricultural development.

9.2.9 Major Preconditions and Recommendations

This program is a pilot project for participatory rural development. It emphasizes farmers' organization, the roles of NGO, and its focus is on the process of farmers' participation rather than on the physical results. The program should be flexible enough so that it can reflect the monitoring results and can go back to the previous stage. It will take time and is difficult to form well-organized groups. Therefore we should make the plan flexible. This program also strengthens human resources of sarjanas by giving them the opportunities to work with the farmers in the fields, try to find out the suitable production, and to work with consultants, therefore they can gain useful experience in farming systems approaches which can then be adapted to other areas.

10 LAND USE / FORESTRY / ENVIRONMENT

10.1 PILOT DEMONSTRATION ON SUSTAINABLE AND INTEGRATED MANAGEMENT OF MANGROVE FOREST

10.1.1 Objectives and Role of the Project

Like any other natural resource, mangrove processes and their related benefits bear both potentials as well as restrictions for human utilization. Most mangrove ecosystems are very resilient and not easily altered in terms of their basic functions, except by major perturbations such as drainage or destructive resource extraction (clear felling, and then soil exposure) or utilization (such as intensive soil tillage and/or peat removal). This means that resource utilization is possible with well adapted management techniques, but that if destruction is too severe it will be a hard task to restore the system. And unlike other natural resources, the destruction of mangrove forests has much more far-reaching physical, ecological, economic, and environmental consequences. In particular, mangrove forests edging coastal lines just in the case of Jambi are so fragile to development pressure that they are easily affected by man's activities.

Mangrove ecosystems thus support a wide range of economic activities, due to the fast growth of mangrove tree species. Rehabilitation and development of coastal zones including mangroves under a framework of appropriate policies and procedures is critical to sustainable and well-organized management of these ecosystems and ensuring socio-economic, ecological, and environmental stability of the areas where these exist.

The mangrove forests all over Indonesia are over exploited for fuelwood, charcoal production, tambak culture and recently also for wood chips, having caused grave concern. So the government has taken some steps to remedy the situation through the overall national conservation programme. Now, introduction of techniques for an integrated and sustainable mangrove management become urgent.

Of the total of some 3.6 million hectares of tidal forest, the estimated area of mangrove forest with management potential in 1990 is 1.2 million hectares, and is distributed by area 21 percent in Sumatra. The number of mangrove species is at least 35 and possibly as many as 60, many of which have not been explored for multiple utilization.The charcoal export trade of some 40,000 tones per year is almost entirely based on Sumatra mangrove forests (MOF/FAO, 1991).

The east coast of Sumatra constitutes an area of great economic and biological importance. In particular, the Strait of Malacca is very rich in marine fish supported by a number of productive coastal ecosystems: mangroves, coral reefs, sea grass and estuaries along its shores and the inflow of nutrients from the rivers of both Sumatra and Peninsular Malaysia. Coastal fisheries in this region are an important source of employment, and provide foreign exchange. In contrast to demersal resources, still largely under exploited, pelagic and shrimp resources have been over-exploited. Environmental changes and degradation in the east coast of Sumatra are undermining the sustainability of fisheries productivity in the area. The management of marine fisheries resources in the east coast of Sumatra, and in particular the Strait of Malacca, requires integrated coastal zone management to prevent further deterioration of the environmental and fisheries resources.

Nature conservation and environmental protection gain increasing attention on the regional level. This is proven by the inter-provincial effort to come to a sustainable protection of the Kerinci watersheds and forests, and the recent plans to develop one regional coastal development and management program, in which the sustainable utilization of natural resources and conservation of some of Indonesia's most important wetland ecosystems is given high priority. For example, from 6-9 June 1988, a technical workshop on Coastal Zone Environmental Planning for Eastern Sumatra was organized in Palembang, addressing the need for systematic planning and management of coastal resources such as mangrove forest.

Important issue could be the development of a plan for protection and selective utilization of mangroves , having multiple functions, though with restricted options for sustainable utilization. However, the mangrove forest type is currently under threat from poor management practices, and information on the status of the mangrove forests and the available natural resources along the eastern coast of Sumatra is severely limited. This makes it difficult to undertake environmental assessment and to allow for appropriate management steps for timely incorporation into planning, design and implementation of development programmes. Although recently some base-line resource inventories have been carried out by PHPA (Directorate General of Forest Protection and Nature Conservation) and the Asian Wetland Bureau, more detailed inventories are needed.

A forested country like Indonesia cannot preserve all its forests. The development process inevitably leads to deforestation. It depends on the valuation of biodiversity how far a loss in ecosystems is acceptable, and on the representativeness of ecosystems conservation whether loss of biodiversity actually takes place on a large scale or not. In this light, Jambi is certainly a province where nature conservation of representative forest ecosystems is given high priority.In this sense, mangrove areas in Jambi are of great importance to sustainable use of natural resources, including its contribution to off-shore fisheries for local communities and coastal protection. As such they contribute to the furtherance of the regional and provincial economic development. The wetland area's population is distinguished from the rest of the province by a mixture of traditional and non-Sumatra coastal communities: Orang Laut, Banjarese and Buginese have their own systems of resource utilization, which are adapted to wetland circumstances. The socio-economic position and specific requirements of these cultural and ethnic communities are a determining factor in the potential for sustainable development of the wetland area including the mangrove, and its contribution to the province as a whole.

Estimates of the original mangrove area in Jambi range between 25,000 to 165,000 ha. In 1982 some 17,000 ha was left (RePPProT, 1988), still covering a large part of the coast, but in smaller fractions. In 1988 it is only left at some locations, with an estimated area of 5,000 ha. Mangrove belts along the coast of Jambi are now usually smaller than 300 m wide, and are cut through by several rivers. Part of the mangrove area was declared Strict Nature Reserve (Cagar Alam Hutan Bakau Pantai Timur) in 1976. It covers officially 6,500 ha, stretching along the coast between Kuala Tungkal and the estuary of the Batanghari River at Muara Sabak, although it is relatively small size but an important reserve as well (Figure 4.10.1). Dominant trees are Avicennia alba (Api-api) and Sonneratia caseolaris (Pedada). The reserve gains international importance for its rich avifauna, being a foraging area for over 20,000 waterbirds and migratory waders from northern and eastern Asia annually, and providing a (breeding) habitat for several endangered waterbirds like Milky Stork (Mycteria cinerea) and Lesser Adjudant (Leptoptilos javanicus). The reserve is surrounded by coastal villages of Buginese and other communities, and part of the actual boundaries of the reserve is in fact defined through land-use activities by these people.

At present, some 2,400 ha of mangrove is left in the reserve (PHPA/AWB, 1992) due to extensive cutting of illegal wood collectors by means of methods aiming at high yields in a short time with the danger of resource depletion. And it is also conspired by local need for fuelwood and agricultural land. Information on hunting is hardly available for the reserve. Present management is, thus, far from optimal, due to the following institutional and infrastructural restrictions:

1) little facilities and manpower in the resorts, insufficient funds, and irregular presence of field staff in the field.
2) lack of information and knowledge on values and qualities of the area both with KSDA (Regional Office for Conservation of Natural Resources, MOF) and local communities.
3) inadequancy of legislation and law enforcement.
4) a lack of cross-sectoral coordination and communication in planning and management which often results in confusions: who is responsible for what

kind of resource use, and where permits for the resource use should be obtained (The problem becomes even more confusing through highly dynamic settlement processes as existing in the coastal areas of Jambi Province).

This situation makes it necessary to regularly re-evaluate land status and land-use purposes, and requires a well-developed monitoring system as well as mangrove reforestation of the adjacent areas, by implementing appropriate zoning to preserve mangroves for the future and making a firm management guideline for the area of mangrove forests to be set aside as conservation areas.

In addition to the natural and social environmental importance, some legal background is:

1) Under the Indonesian traditional zone concept, settlements and enclaves within the reserve are not allowed. A new act on Protection and Conservation of Natural Resources has been drafted which includes modifications pertaining to the settlements inside protected areas and resource exploitation. Since 1983, the Marga (a central village including smaller satellite settlements and their lands plus waters) system has ceased to operate and the district (Kecamatan level) offices of the fishery and agriculture as well as forestry provincial agencies are now in control of leasing the rights for collection of minor forest products. The control of minor forest utilization inside the reserve area is the sole responsibility of PHPA (Directorate General of Forest Protection and Nature Conservation, MOF) .

2) Cross-sectoral law on environmental management, of high relevance to the project area, is the Presidential Decree concerning Protected Area Management (KP No.32/1990 tentang Pengelolaan Kawasan Lindung). This decree is directed at areas which are or will be established for sustainable protection of their environment, and which are of importance for sustainable development.Almost twenty types of protected areas are defined in this law, with their functions and (therefore) values, of which some show overlap, due to having several functions. A relevant criterion for protected areas in the mangrove area of Jambi is :

   Coastal Mangrove: width>130 times the difference between high and low tide (Section 27 of the KP No.32 above). For the coastal areas of Jambi, where tidal difference roughly varies between 2.5 and 3.5 meters, this means a width of 300 to 450 meters of protected land from the shore-line landwards (PHPA/AWB, 1992).

This project aims at improvement of development planning and mangrove resource allocation. Under this overall goal, the project objectives are divided into short- and long-term as below;

1) Long term objectives:
   a) to identify options for sustainable development of mangrove resources.
   b) to reduce adverse economic, social and environmental impacts.
   c) to upgrade the management for the reserve.
   d) to avoid resource conflicts and loss in revenues related to development such as tambak.

2) Short-term objectives:
   a) to create an inventory of mangrove ecosystems.
   b) to identify types and patterns of mangrove use.

c) to analyze the socio-economic/environmental potentials for development alternatives.
d) to establish and demonstrate an integrated and sustainable system of mangrove ecosystem management, in particular for marine products and preservation of wildlife habitats.
e) to produce/update the manual of mangrove management.
f) to promote income earning activities for local communities through activities such as production of non-timber forest products, wildlife farming and eco-tourism.
g) to train selected personnel through on the job training, study tours and fellowships.
h) to promote to gazette all KJP land (Figure 10.1.1), which constitues a land system with mangroves as original vegetation, outside the reserve as protection forest.
i) to rehabilitate or reforest with mangrove species where already degraded in and around the reserve (Figure 10.1.1).

10.1.2 Location

In and around Hutan Bakau Pantai Timur Reserve (6,500 ha) along the coast of Jambi Province, in the sub-districts of Tungkal Ilir, Muara Sabak and Nipah Panjang, comprising of seven small mangrove areas, separated by (non-protected) rivers, amounting to 18,700 ha (KJP) in total.

10.1.3 Executing Agency

Directorate General of Forest Utilization (PH) in cooperation with Directorate General of Forest Protection and Nature Conservation (PHPA) as well as Directorate General for Reforestation and Land Rehabilitation (RRL), Directorate General of Fisheries, and Forest Services of the Jambi Province.

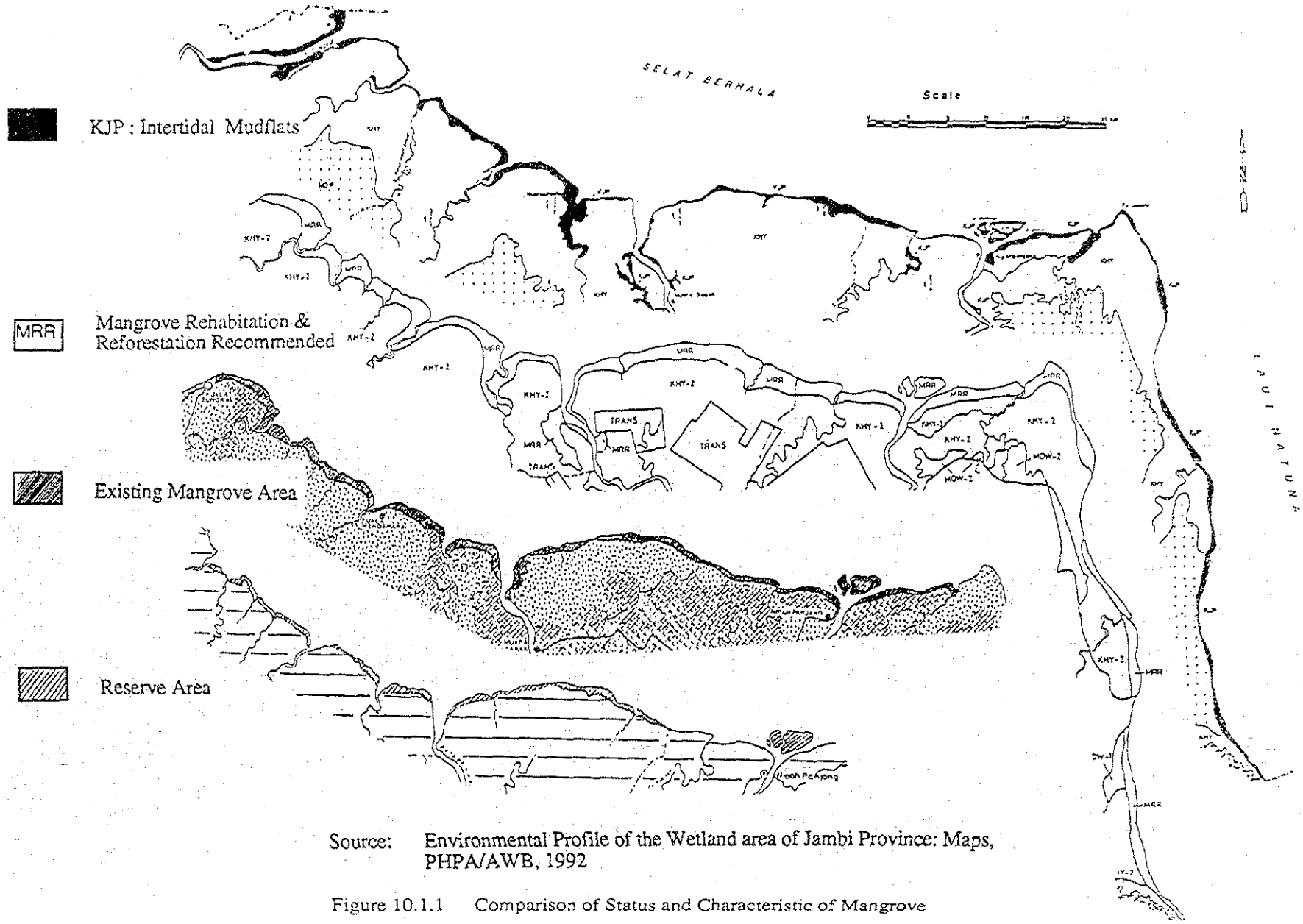
10.1.4 Expected Benefits

Full and effective implementation of the project is envisaged to bring forth outputs such as :

1) establishment of integrated and sustainable mangrove management system for production of forest, marine and non-timber forest products as well as preservation of wildlife in the selected location of Jambi's mangrove forest.
2) preparation of guidelines and determination of a research methodology appropriate for an integrated and sustainable mangrove management system in the region as well as Indonesia, and a manual of mangrove management.
3) training of about 13 selected senior personnel in forestry and fisheries, in sustainable mangrove ecosystem management.
4) increased awareness of local inhabitants as well as forest cutters exploiting mangroves on the value and function of mangrove forests.
5) publishing of an inventory of the province's mangrove forests, their functions and sustainable utilization.
6) improvements in coastal area protection through reforestation.

Through these project outputs, it will be possible to enhance or recover valuable functions inherent to mangrove ecosystems as well as benefits that people could enjoy by means of a sustainable contact to the mangrove forests.

The mangrove forest performs important sustainable socio-economic functions, which support the livelihood of the rural community. These forests are of value both for their commercial hardwoods and for their non-timber products, including important herbs and drugs (and wild ancestors of fruits such as durian,Durio sp.). Up to 100 different products or services provided by mangrove forest are known to be exploited on a sustainable basis (PPLH



Source: Environmental Profile of the Wetland area of Jambi Province: Maps, PHPA/AWB, 1992

Figure 10.1.1 Comparison of Status and Characteristic of Mangrove

/ UNSRI, 1988). The most important mangrove forest products in the eastern Sumatra region are firewood, charcoal, thatching and poles. In addition, the mangroves help suppress erosion, saltwater intrusion and coastal damage, provide an ideal breeding ground for all sorts of aquatic creatures such as fish, prawns, shell fish and different members of the crab family. Because of their special nature, they are, thus, not only ecologically important but have significant economic value as well. The reserve must be seen to be in the regional/provincial interest so that its improvement will constitute benefits to a large amount of population. These benefits in detail are:

(1) Forest Products

The preferred raw material for charcoal is mangrove (Rhizophora and Bruguiera spp) because of its high wood density. Mangroves are also used for producing wood chips for pulp industry. The reserve has been a source for these species, despite its protected status. In the reserve, logging with the purpose of providing fuelwood for coconut-oil factories is still taking place, while sawmills were operated in the area till 1988.

Some tree and her species have horticultural or pharmaceutical potential. Other trees are known for their latex (Jelutung, Dyera costulata), essential oils (Melaleuca), tannin, and various non-wood products from Nipa (leaves for roofing and daily necessaries, fruits as food, sap from stalks as raw materials for sugar, alcohol as well as vinegar). Indeed additional income is derived from the husbandry of these minor mangrove forest products. This is normally done by the people individually during the west monsoon season, when fishery activities almost entirely cease. But in the majority of the cases, these forest products are used by the people themselves. Seven main products are listed up although the data are only for the Banyuasin-Sembilang Swamps in South Sumatra, not for the project site itself (Table 10.1.1).

Table 10.1.1 Minor Forest Products Gathered from the Banyuasin-Sembilang Swamps

Product	Scientific Name	Use	Value (Rp)	Total trade in million Rp, value 1988 prices
Nibung	Oncosperma tiggilarium	Scaffolding	1,500	24
Rattan	Korthalsia/Calamus	Furniture	1,250	4.8
Nipa	Nypa fructicans	Thatching	60 per sheet	n.a
Bakau	Rhizophora sp.	Firewood	400 per 100	n.a
Fruits	mainly Eugenia sp.	Food	500	n.a
Jelutung	Dyera costulata	Latex	600 per kilo	30.7#
Meranti	Shorea sp.	House constr.	n.a	n.a

Source: Banyuasin - Sembilang Swamps' Case Study. AWB. 1989.
#:based on 1989 expected harvest of 400 kg per month per collector during a 8-month season.
n.a: not available

(2) Fishery

One of the most important biological features of the mangrove ecosystem is its high production level. This is mainly in the form of detritus, which consists of fallen leaves and other litter, being broken down by organisms like crabs and fungi. This detritus is the main source of food for many other organisms, such as zooplankton, crabs, fish and prawns. Prawns are one of the most valuable mangrove-related species in Indonesia, with a present export value of some US $ 200 million a year (PHPA/AWB, 1992). Many fish and saltwater invertebrates are dependent on the mangrove forest for the completion of their lifecycle mostly during their juvenile stage. It is estimated that one hectare of mangrove forest supports about 100 kilogram of prawns per year and 300 kilogram of offshore fish (PPLH/UNSRI,1988).

Sea-fisheries production in Jambi Province comes exclusively from the coastal wetlands. Compared to the neighbouring provinces of Riau and South Sumatra, total fishing

area and total production figures are small, but for the regional economy it is significant. Present stocks are probably becoming over-utilized, and expansion can only occur through increased pelagic fisheries. The reserve has a major function in supporting the potential sustainable development of a marine fishery industry, with spin-offs for the greater part of the province's coastal inhabitants. Through regular implementation of control and monitoring of fishery activities and stock inventories, maximum sustainable yield levels can be established.

(3) Protection Function

Due to their occurrence along the coast, mangroves serve as protective belts for inland areas against storms and waves. Inherent to this location is the high flow of sediments from rivers and the sea. Mangroves trap these sediments with their roots, use its nutrients and thus build up new land.

Conversion of coastal forests, especially mangroves, into sawah or coconut gardens, and destruction of these forests for firewood and construction material has led to coastal erosion and increased saltwater intrusion. Erosion can be seen all the way along the coast-line, while saltwater intrusion is a major problem in tidal areas up till 10-15 kms upstream. Both problems are related to the depletion of the coastal protection function. Sea water can more easily flood the coastal lowland areas, aided by the high tidal fluctuation of the South China Sea. Increased coastal agricultural or fish-pond development will further decrease the protection function. Saltwater intrusion is likely to have penetrated further during the dry season, due to alterations of the water regime. This condition has affected agricultural production and has resulted in loss of yields (especially rice) in an estimated area of 1,000 km2 (PHPA/AWB, 1992).

Only coastal protection is for a great deal supplied by mangroves alone among the wetland forests, and therefore the conservation of mangroves is already important for this reason--nature conservation values.

(4) Biological Values

The forest canopy and exposed mudflats provide habitat for a great many species of birds. The tidal mudflats of eastern Sumatra play a vital role in the annual migration patterns of waterbirds. Jambi's coastal areas are especially important to this, providing a feeding ang breeding habitat for tens of thousands of migratory birds and waders annually, including several Red-Data-Book species such as Asian Dowitcher and Nordmann's Greenshank.

Common fauna elements of mangrove forests are crabs like Fiddler Crab (Uca dussumeiri), Mudlobsters (Thalassina anomala) and snails. These creatures are all well adapted to salinity variations. On bare mudbanks mudskippers are common. A limited number of mammals are found in mangroves such as the long-tailed macaque (Macaca fascicularis), silver-leaf monkey (Presbytes cristata) and pig-tailed macaque (Macaca memestrina). Large roosts of flying foxes (Pteropus vampyrus) are often a striking feature of the mangrove forests.

In addition to collection of tree species and fishery, probably wildlife products provide a source of income for people around the reserve, as well as for those coming from other areas. Due to a lack of data on wildlife trading for Jambi, the case of the Banyuasin-Sembilang, South Sumatra, is presented next just for reference.

Table 10.1.2 Rare and Endangered Protected Fauna Recorded in Jambi's Mangrove Area

Scientific name	English name	Indonesian name	Status
(Mammalia)			
Felis viverrina	Fishing cat	Kucing bakau	R
Pantera tigris sumaterae	Sumatran tiger	Harimau sumatera	E, S
(Aves)			
Mycteria cinerea	Milky stork	Bluwok putih	E
Ciconia episcopus	Wooly-necked stork	Bangau hitam	E
Leptoptilos javanicus	Lesser adjudant	Bangau tontong	E
Argusianus argus	Great argus	Kuau	R
(Reptilia)			
Crocodylus porosus	Estuarine crocodile	Buaya muara	E

(Status) R: Rare
E: Endangered
S: In Indonesia only present in Sumatra

Source: Environmental Profile of the Wetland Area of Jambi Province. PHPA/AWB. 1992

Trade in wildlife from the mangroves in the Banuasin-Sembilang is mainly centred around two reptiles species: Estuarine Crocodile and Monitor Lizard (Varanus salvator). Around ten families are believed to be engaged full time in Monitor lizard trapping during a three-month season (June-December). Along the Sembilang river up to 1,300 lizards were trapped in 1988. Although under the CITES (Convention on International Trade in Endangered Species) regulations for Indonesia, officially no crocodiles skins from the wild are allowed to be processed, still up to 50 fishermen are poaching these rare animals during the months June-August. The fishermen mainly collect young crocodiles from crocodile nests in the swamp forest. They are sold when they reach the length of 40 cm and above to a number of exporters based in Palembang. Crocodile hunters from the Sembilang river said that they do not kill adult female crocodiles, so as not to endanger a sustainable harvesting of young. However, the population of crocodiles in the Banyuasin-Sembilang is now believed to be at the verge of extinction (Fiselier, 1990). Trade figures are given in Table 10.1.3

Table 10.1.3 Trade Figures in Crocodiles and Monitor Lizards, Banyuasin-Sembilang Mangroves, 1988

Species	Unit Price (Rp/piece)	Number caught	Total Value (Rp.mil.)
Estaurine Crocodile	225,000 (adults)	30	6.8
	40,000 (young)	1,200	48.0
Monitor Lizard	6,500	3,000	19.5

Source: Living Off the Tides, J.L Fiselier, 1990

(5) Other Additional Benefits

As additional benefits from the mangrove forests, gene bank as well as site for tourism and/or research could be included. Job opportunities may be created by local (wildlife) tourism industry, while there is increased attention by the national and international scientific community. Applied research for the furtherance of the local economy may be undertaken in such fields as sustainable crocodile harvesting, bee-keeping in mangrove forest.

The benefits of Jambi's mangrove ecosystem are numerous, especially if we look at the products that are supplied by the mangrove forests and riverine systems. Many species of wood, fish and prawns are exploited in the area. Primary production in mangroves is up to 2-4 kg/m2/year. Compared to the estimated mean production of cultivated land (0.7 kg/m2/year), this is a high figure and reveals the importance of natural mangrove ecosystem as producers (PHPA/AWB, 1992).

The project is expected to provide significant ecological and environmental benefits (external benefits) besides direct benefits to the project participants through employment generation and production of trees and tree products. Exact nature and magnitude of the benefits would be determined during the design phase of the project.

10.1.5 Outline and Phasing of the Project

The project area is 18,700 ha including the mangrove reserve. The project is designed to carry out a reconnaissance survey and field investigations along the shores of the province for determination of the status of mangroves and other coastal resources, to develop a rehabilitation and management plan and to undertake implementation of the plan as a pilot demonstration project. The proposed project is expected to include components such as nurseries, plantations, infra-structure development, institutional strengthening and other support services including research and extention. Accordingly, the schedule of the project could be divided into the following two phases:

(1) Phase I (1 year)

During the start of Phase I, aerial surveys will be conducted. Low-level flights will allow the project team to make a rapid assessment of the status of the coastal forest and to identify colonies of breeding waterbirds. The aerial surveys will be followed up by ground surveys. Before large scale interventions takes place in the coastal environment, base-line studies for land-use zoning plan are required. Such land-use plans, based on sound ecological data and recognising the natural values of coastal swamplands could contribute to sustainable and multiple use of the coastal resources. The project team will propose to delineate buffer zone areas. It will allow the present inhabitants to continue their living inside the reserve boundaries, with restriction on further immigration. The buffer zones provide the local population with traditional harvesting areas for essential products (firewood, house construction materials , etc.) Under the Indonesian Forestry Act of 1967, the term buffer zone is not described or defined. Instead the wording traditional use zones has been established. According to the law, such area is the land belonging to the reserve which will be managed by the authorities for the benefit of the local communities to ensure that minor forest products can be gathered in a non-destructive way.

Additional awareness campaigns will be required to clarify aims and functions of nature conservation to local communities, to explain which activities in and around the reserve are allowed and to gain insight in ideas on nature conservation from the local communities themselves. Furthermore it should be explained what govermental regulations apply to nature conservation in the wetland area, and what the consequent law enforcement encompasses.

These project components in the Phase I should be resulted in :

1) Land-use zoning maps of coastal area of Jambi province, showing areas which are suitable for multiple-resource utilization such as the mangrove forest and areas which are in need for strict protection.
2) Preliminary management plans for high priority conservation areas in and around the reserve.
3) Increased awareness of the value of mangrove forests amongst planners, decision-makers and local people.
4) Establishment of a Provincial Mangrove Information Data Base run by PPLH (unversity - based Environmental Study Center) which will be regularly updated.
5) A comprehensive report detailling a management strategy for mangrove forests of Jambi province, with an assessment of the potential and existing impact of planned regional developement.

(2) Phase II (3 years)

The team of experts would be expected to travel to the location to establish the demonstration area for sustainable mangrove ecosystem management, to provide necessary equipment and, to train some 13 local professional and technical staff in integrated and sustainable mangrove forest management. Activities in the site would be linked with research on mangrove ecosystems done in the Phase I. The present problem in the reserve with illegal settlers and collectors of Jelutung and other products cannot be solved only by moving the people out or prosecuting them. Especially where it concerns people who have come from a situation of extreme poverty elsewhere, and who might not have been fully aware of the legal status of the reserves, additional assistance to find other ways of making a living should be given as much as possible.

Rehabilitation and improved management of the Hutan Bakau Pantai Timur Strict Nature Reserve is crucial to the protection of Jambi's mangrove areas for their functions in coastal protection, feeding and breeding grounds for fish, prawns and waterbirds. Deforested parts of the reserve (an estimated 50 to 75%) should be replanted as pilot demonstration of mangrove reforestation (PHPA/AWB, 1992).

10.1.6 Cost Estimation

Considering the presently envisaged components of the proposed project, the investment potential of the project is likely to be in the order of $ 2.0 million, as follow in detail:

(1) Phase I

	m/m	US$'000
Expertise		
Mangrove specialist	12	
Silviculturist	6	
	18	165.0
Consultants		
Fisheries	6	
Anthropologist/Sociologist	6	
Natural resources ecologist	5	
Economist/environmentalist	5	
Soils expert	3	
	25	286.4
Sub total		451.4
Equipment and material		72.5
Operating costs		60.0
Total		583.9

(2) Phase II

	m/m	US$'000
Expertise		
Mangrove plantation specialist	24.0	
Silviculturist	22.0	
Sociologist	24.0	
Forestry economist	12.0	
	82.0	820.0
		1,025.0
Equipment and material		113.5
Training		205.0
Operating costs		2,163.5
Total		

10.1.7 Appraisal

Although Indonesia possesses the knowledge and experience in reforestation and rehabilitation of mangroves and coastal zones yet, their further development planned under Repelita V and VI is seriously limited by institutional weaknesses and availability of financial resources. The negative ramifications of not addressing the problem are not only economic but ecological and environmental as well. Accordingly, very little silvicultural research has been done on mangrove rehabilitation and regeneration, and results to date are unsatisfactory, except for some areas in Jawa, where mangrove planting has been done by Perum Perhutani (a state-owned company responsible for the forests on Jawa). In 1988, Asian Wetland Bureau (AWB) and Directorate General of Forest Protection and Nature Conservation of the Ministry of Forstry (PHPA), had prepared a project proposal on improving Wetland Management and Conservation in Indonesia. An agreement on the implementation study of Sumatra Wetland has recently been signed. The ODA/UK project on support to conservation and environment contains an element to establish a working relationship with the Directorate General of Fisheries on the management and conservation of mangrove in North-Eastern Sumatra and Western Kalimantan.

In addition to the technical and financial aspects above, the economic evaluation of the project will include a hard work due to the intangible environmental and social benefits involved. Mangrove areas have not indicated to yield sufficiently, as is the case in most transmigration schemes and in spontaneously cultivated peaty areas, where soil conditions tend to be bad. In these cases we can probably say that environmental loss (original forest and ecological functions) outweighs agricultural production.

An initial environmental examination carried out by the present study team has implicted no significant adverse impacts on environment of the project. Rather, it surely brings forth functional improvement on most of the physical environment such as water, biological ecosystem and air preventing the existing/potential natural risks and hazards. It is because of the environment-oriented nature of the project.

A preliminary social screening has categorized the project as direct positive social impact project. This project includes a sustainable approach for environmental use of local people as well as human resource development as management training, neither displacing/disrupting population nor significantly changing their relationship to the environment.

During the further study stages (F/S or designing), some detailed examination on social and environmental aspects might thus be little necessity although the items below should be included in the economic analysis to explicit comprehensive project benefits against the direct project costs, as much as culculable :

1) Social and environmental direct benefits on site.
2) Further environmental enhancement benefits in off-site.
3) Opportunity costs of alternative development using natural resources protected.
4) The project costs of environmental protection measures and safeguards.

10.1.8 Major Preconditions and Recommendations

Whatever the potentials for good forest management have been or are, it will be clear that the environmental conditions have been altered or affected by the fairly recent process of land-clearing for commercial forestry and agriculture. Difficulties may come from a lack of both will and bureaucratic flexibility to establish inter-governmental cooperation. Planning can become more efficient if there is one coordinating body. Administrative boundaries may inhibit a flexible and dynamic planning process. A solution can be sought in setting up one inter-governmental coordinating team, consisting of BAPPEDA, other relevant agencies and interest groups, that has the power to guide development.

Although potentially suitable for coastal fish-pond development, the mangrove area in Jambi is relatively small, and most is inside the reserve. Developments in the fish-pond sector should be very carefully evaluated and, if implemented, should be carefully monitored, as it may alter water regimes and is often practised with use of pesticides. In fact, the reserve is at present under threat from plans to develop 25,000 ha of tambak in the coastal area (PHPA/AWB, 1992). Since already most mangroves are depleted or destroyed, tambak development is expected to be restricted to at least coastal areas outside the mangrove reserve.

Mangrove forests are essentially 'open ecosystems', maintained by processes of soil and water that largely originate from outside the mangrove. Mangrove trees are more salt tolerant than any other tree-species, but still need supply of fresh water from rain or rivers often especially through groundwater. For the existence of mangroves, it is especially rivers and backswamp areas that supply fresh water. Therefore, the protection of river courses and swamp forests should be safeguarded as well, against the clearing of land for the agricultural practices.

The reserve in fact encompasses only mangrove forest, but no mudflat areas, and its boundaries are static. This might give rise to problems in the future, because mangroves from a very dynamic ecosystem that moves seawards due to land-accretion processes. In the extreme case, the mangrove forest of tomorrow might be the mudlflats of today. Since the mudflats do not gain attention for conservation yet, its importance for waterbirds may be affected due to human disturbance for e.g. fisheries. The reserve will be increased if surrounding land could be managed as a buffer zone after being replanted with mangroves. It also seems that remnants of mangrove areas along the coast near Berbak Wildlife Reserve and north of Kuala Tungkal (all outside the reserve) have not received the status of protection forest. This should be given on basis of KP No. 32/1990 on Protected Areas Management.

In Jambi, there is little dialogue with non-governmental organizations. This is partly due to the small number of regional NGOs, but this could be overcome through cooperation with nationally organized NGOs. Especially in discussions between government and local communities on social and environmental issues, NGOs have the potential to serve as intermediaries to convey the needs, concerns and aspirations of social groups to the relevant government agencies. On environmental issues, the Indonesian Environmental Forum WALHI acts as an umbrella organization, and has extensive knowledge of natural resource utilization and sustainable planning.

Related to the village development sustainably using mangrove products, it should be proposed to open up and develop isolated villages with financial support from APBD (budget proposal for regional projects) Tingkat I or from APBN (sectoral projects) and foreign aid, following frameworks for village development on a macro level.

10.2 INDUSTRIAL FOREST PLANTATION

10.2.1 Objectives and Role of the Project

On the national level, exports of primary forest products fell by nearly 25 % over a decade primarily due to two successive sets of trade restrictions. The first, a ban on log exports, was phased in during the early 1980s, causing log exports to fall from about $ 500 million in 1981 to zero in 1985. The log export ban provided a heavy subsidy to the plywood industry, which strongly expanded exports over the 1980s. Sawn timber exports also increased from about $250 million in 1981 to about $600 million in 1989. In 1990, a prohibitive export tax on sawn timber reduced sawn timber exports to almost zero, providing futher protection to the wood products industries (WB,1991). Meanwhile, the international prices of chips (pulp) for paper manufacture have increased, so that industrial forest plantations are strongly promoted by the goverment which intends to establish the forest industry through a large-scale

afforestation. Both forests and forestry are, thus, directly affected by market and political pressures.

For Indonesia like other tropical nations, it is urgent to keep a economic growth by means of efficient development combining population and resources,and at the same time to protect tropical rain forests contributing to prevention of the global warming as well as preservation of biogeneric resource for the future generations. Such development as transmigration activities are limited only to convertible forests. Nevertheless, Indonesian tropical forests would most likely disappear, if its population continues to increase and its economic gap from the developed countries expands.

The rapidly increasing demands for providing Indonesia's domestic and export markets with timber, pulp and other wood products will outpace the suitainable supply from the country's natural forest early in the next century. An ambitious forest plantation programme is necessary to make good the shortfall. National plans have called a total of six million ha of industrial forest plantations by the year 2000, or an additional 4.4 million ha from 1990 to 2000. Even though only 1 million ha of new plantations seem possible during this decade, plantation activities can be increased in line with increasing capabilities and experience (MOF/FAO,1991).

In this context, it is important to note that a first-stage reconnaissance resource survey (RePPProT) has recently been completed for the whole of Indonesia including the Province of South Sumatra. A data base and maps at 1:250,000 scale produced in this survey show land quality (land system), land availability (land-use and land status) and 760 area covering 153,000 sq. km with agricultural and forestry development potential (RDAs). The RDAs represent the logical focus for extending future development activities. Many RDAs are covered at least partly in production forest and many lie adjacent to censervation forest. Demand for development land in South Sumatra will continue to rise as population increases and the government investment in economic diversification and more geographically equitable development takes effect. To justify maintaining or conserving any RDA forest in the face of these pressures, it is essential to know the value of the forest for social, biogenetic, timber or non-timber production purposes. Futhermore, it is necessary to balance these values against those which might obtained through alternative uses of the land.

In addition, the Government of Indonesia's recognition of the value of integrating conservation and development is not reflected in the current system of forest concession in the lowlands of the province. According to information from Dinas Kehutanan (Provincial Forestry Service),today reforestation has only been carried out by the limited number of the concessionaires especially in the coastal region. The current logging practice, selective logging, is in a number of forest areas not being carried out in a sustainable way.

For Pelita V, South Sumatra Province expects to build industrial plantation forest as wide as 250,000 ha, whereas until 1990/91 fiscal year it is expected to reach 26,500 ha. This is one of the 11 strategical projects introduced by the province, to accelerate economic growth and to make impact toward the regional development (BAPPEDA,1991).

The objective of the project is to enable the rate, capacity, experience and efficiency of industrial forest plantation establishment to be substantially increased to meet the requirements of the national and provincial plantation programmes, which have been designed to make good the shortfall in timber supplies from natural forests early next century. The immediate objectives are:

1) To identify suitable sites for establishing industrial forest plantations in the province with emphasis being given to the rehabilitation of degraded land, and taking into consideration the recommended development areas (RDAs) with agricultural and forestry development potential.
2) To establish the pattern of wood flow, and assess the size and desirability of investment needs.

3) To identify the institutional, legal, social, and biogenetic aspects, timber or non-timber production areas, and procedural requirements or improvements.
4) To extend the required planning and monitoring system at the headquarters of the Ministry of Forestry to the province, and to strengthen technical and institutional capability for plantation programme and project preparation at provincial and concession levels.
5) To rehabilitate forested and grassland appropriate for industrial forest plantation including the IDEP programme sites.
6) To disseminate the importance of soil conservation through re/afforestation.

10.2.2 Location

Province of South Sumatra including the both islands of Bangka and Belitung.

10.2.3 Executting Agency

Dinas Kehutanan, Kantor Wilayah Kehutanan (Regional Forestry Office), and Directorate General for Reforestation and Land Rehabilitation (RRL) of MOF.

10.2.4 Expected Benefits

First of all, the required information can be obtained through multi-disciplinary field surveys to collect forest, land and socio-economic data. Field surveys of RDAs which contain at least 60% forest or which are adjacent to conservation forest will need to be conducted as soon as possible to quantify the socio-economic and biogenetic values of the forest. For those RDAs which contain little or no forest, the need for such surveys is less urgent.

Next, in general, the project might more or less accelerate economic growth and make some positive impact toward the provicial and regional development. The project can provide not only raw materials for industry but is expected also to provide jobs to local people and to improve area productivity and the quality of enviroment.

The province, among others, has a good example of industrial afforestation activity to predict its benefits; the Afforestation Technical Project in Benakat funded by the Japanese goverment. This project started in 1979, and finally planted acacia, eucalyptus, etc. mostly originated in Australia or Malaysia, in the alang-alang land of 3,100 ha, establishing industrial forest plantations. During the peak period of the project, 1.5 million trees were annually planted creating new job opportunities of some 40,000 local people. The daily allowance for afforestation work was Rp 1,250 per capita on average. Moreover, these planted species are so fast growing that they can be logged after only 5-8 years for commercial purposes. In fact, partial logging has begun as pulp wood since even 1987. This pilot forest plantation project has shown enough potential for barren field or grassland to be made productive through afforestation enriching soil and water, further bringing positive effects to agricultural output, and thus converting the degraded ecosystem to a productive one.

But as for these project benefits, there are some points to be considered carefully for their realization. The first point is related to forestry lobourers, who have not been well analized so far due to lack of sufficient data. It is said that forestry manpower is mostly coming from external areas, in principle. It is that local people cannot be easily hired because they tends to quickly quit their jobs with hardness in the working conditions, or because forestry especially in the mountainous areas requires skillful labourers. Due consideration should, therefore, be taken for employment opportunities created by the project to fully contribute to local economy rather than the outer regional economy. Another problem is that the market prices of such fast-growing trees are relatively low due to the limitation of their usage.

10.2.5 Outline of the Project

The province has already started an industrial forest plantation program which is one of efforts to provide raw materials of forest industry including paper industry. It is covering an area of about 694,200 ha involving 25 concession companies (BAPPEDA ,1991).The proposed project, which aims at complementing and providing with a systematic approach the program above, is mainly consisting of the following two phases:

(1) Phase I

The analyses of soil for nutrients, texture and suitability for plantations, etc. will be carried out in cooperation with Forest Research Institute (BPK) and/or laboratories in the province. Computerised data bases will be established in the province, at the same time as the execution of land capability surveys. It is estimated that the province will require a few of computers.The basis for land-use decisions and land capability surveys will be the forest land-use maps of the National Forest Inventory (NFI) at 1:250,000 scale supplemented by RePPProT maps of the same scale, 1:20,000 scale aerial photographs of forest concessions and satelite imagery.

In the case of RDAs, initially the aim would be to screen the areas to identify those RDAs whose forests have not been logged, and which on the best evidence available should not be disturbed because of their anticipated biogenetic or non-forest product values. This would be essentially a desk exercise with minimal fieldwork. Full use would be made of existing resource and ecological survey data, records from timber concessionaires, air photography and remote sensing. Priority areas for immediate ground surveys will be identified. A multi-disciplinary team consisting of an experienced silviculturist, ecologist, social forester and forest economist can be expected to take about 6 months to complete the screening.

After the screening exercise, field surveys will be carried out on the RDAs. The purpose would be to provide reliable quantified data on the value of RDAs for socio-economic and biogenetic purposes, and for other alternative uses. These would include conservation, production forestry (clear felling, selective felling, plantation forestry), tree-crop agriculture and foodcrop agriculture. The data would provide planners and decision-maker with clear evidence to handle disputed claims for forest-retention in an RDA or for allowing forest clearance for alternative development.

(2) Phase II

Being based on the results of the Phase I, this stage is to initiate pilot demonstration at sellected priority locations of about 20,000 ha for industry forest plantation. For this operation, local people's participation might be necessary by bringing some families into the units of industrial plantation forest either as permanent workers or as "plasma" in the pattern of PIR (Nucleus Estate Smallholders, NES), because the priority area is apt to be remote with few labourers. In the case that a selected area is covered with alang-alang, it will take a few of years for its clearing before actual planting. This stage will need 300 m/m forestry experts, and include project components such as:

1) Encouragement of private sector investment in plantations.
2) Provision of incentives for participation of local communities and national NGOs in reforestation and community forestry.
3) Discourage of mono-cultures in plantations and increase in the percentage of long rotation indigenous hardwood species.
4) Establishment of nursery
5) Preventive measures against flying sparks from neighboring shifting cultivation.

(3) Major Outputs through Phases I and II

1) Field experts will be trained in land-capability and soil surveys, and some 2 million ha of land (Figure 10.2.1) will be surveyed for its suitability for forest plantations.
2) Study of the pattern of wood flow in relation to existing or planned wood processing industries, the size of plantation areas by tree species, and the current status of grassland utilization.
3) Analysis of considerations - institutional, legal, social and biogenetic-and procedural requirements for establishing and managing forest plantations.
4) Identification of high priority RDA (recommended development areas) for immediate ground survey: data on the value of RDAs for socio-economic and biogenetic purposes and production forestry.
5) Master plan for industrial forest plantations in the province.
6) The technical and institutional capability for the preparation of forest plantation programmes and projects at provincial and concession level.
7) Training and overseas fellowships.
8) Identification of species suitable to the targeted land, and development of silvicultural technigues for industrial forest plantation, through the plantation activities.
9) Expansion of forestry reserach and training, emphasizing management techniques for logged forests.

10.2.6 Phasing

(1) Phase I (1 year)

The province needs to be prioritized and expansion of plantations should proceed accordingly. Input has been on the assumption of 2 mil ha of land to be investigated in the province and that one team of one soil surveyor, one assistant and seven labourers can survey 2 mil ha in two field seasons. Such a team should be trained and put to work in the first year of the project. This team will be able to complete the task of preparing master plan covering an area of 2 mil ha by the end of the first project year. Two types of survey will be established to examine lands: (a) RDAs, (b) bush or grasslands excluded from RDAs. Depending on the number of RDAs involved, futher phasing of field surveys may be required. The field surveys would be undertaken by local survey companies under close supervision by an expatriate advisory team.

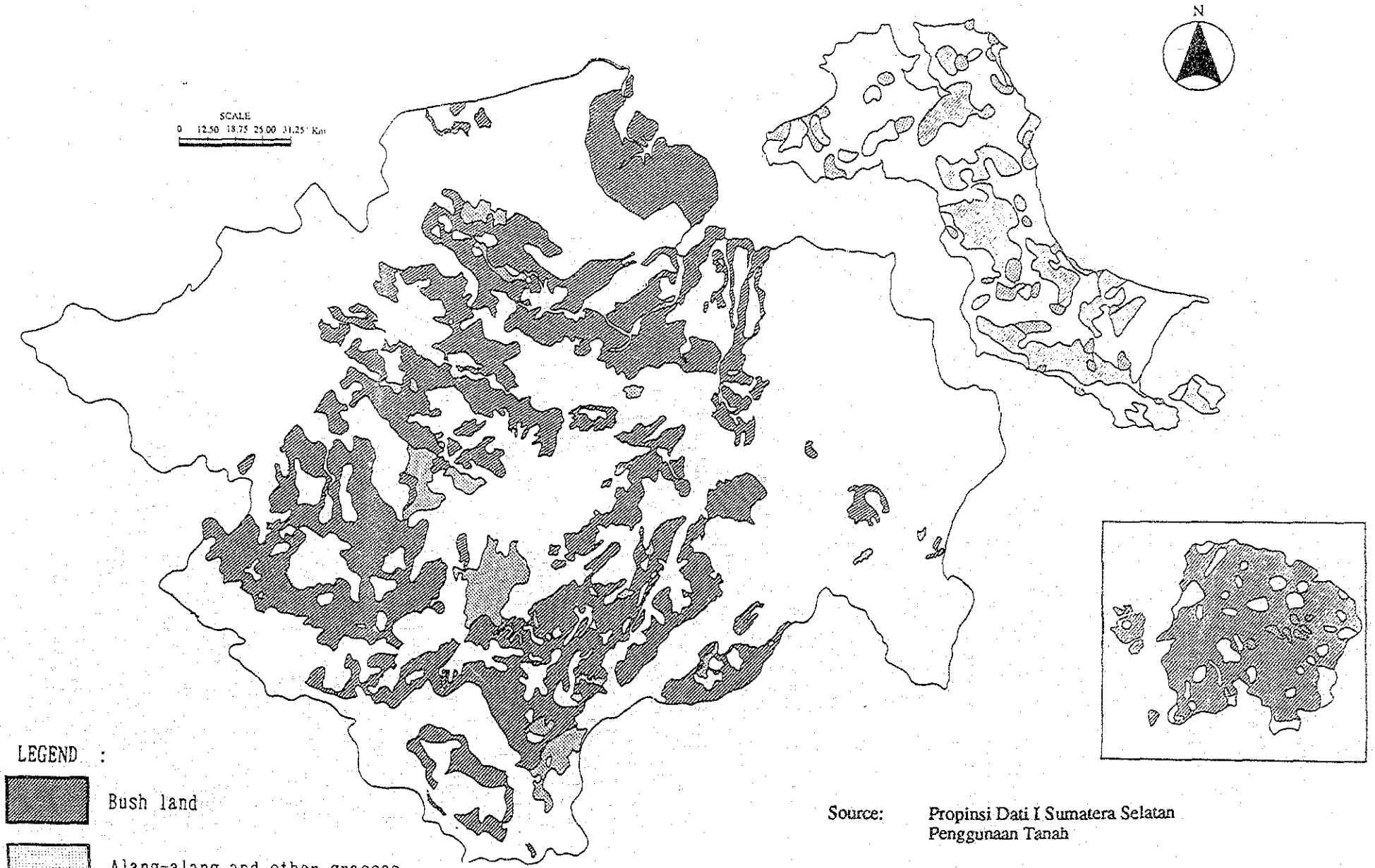
(2) Phase II (10 years)

This is for establishment and promotion of industrial forest plantation covering around 20,000 ha.

10.2.7 Cost Estimation

(1) Phases I

	m/m	US$ '000
Expertise		
Land-use	3.3	
Resource Economist	2.7	
Plantation specialist	2.7	
	8.7	86.7
6-month multidisciplinary team consultancy for screening lands	1.3	16.0
Soil specialist	0.7	
Watershed specialist	0.7	
Sociologist	0.7	



Source: Propinsi Dati I Sumatera Selatan
Penggunaan Tanah

Figure 10.2.1 Bush and Grassland to be Assessed for Industrial Forest Plantation in South Sumatra

System specialist	0.7	
Consultants various	0.4	
	3.2	37.3
Sub-total		140.0
Equipment and materials		169.3
Training		28.3
Operating costs		29.1
Total		226.7

(2) Phase II

	m/m	US$ '000
Expertise		
Plantation specialist	120.0	
Forestry machine expert	120.0	
Forestry economist	60.0	
	300.0	3000.0
Equipment and materials		5200.0
Fellowship		1200.0
Operating costs		600.0
Total		10,000.0

10.2.8 Appraisal

Irrespective of the incalculable global economic benefit from the project, as well as the protective value locally, the project as a whole only makes sense from a local (district or provincial) economic perspective if the benefits generated through the project are greater than the development benefits foregone. In the absence of quantitative analysis it is currently impossible to judge whether this will be attainable. The opportunity costs of setting the proposed production forest plantation (development benefits foregone) have not been estimated but are likely to be considerable. Unless the province receives development benefits from the project which it perceives as exceeding the value of opportunities forgone, there will be no positive incentive for it to continue supporting the project. The study team stresses the need during preparation to estimate the opportunity costs and benefits associated with setting the production forest plantation, as well as for cost-benefit analyses of some of the proposed development options although economic analysis would not be the only criteria for selection of proposed components, such as :

1) All costs of environmental protection measures and safeguards.
2) The costs of any environmental damage.
3) Costs and benefits to achieve futher environmental enhancement benefits on- or off-site.
4) Opportunity costs of natural resources (especially land) used in the project.

In conection of the environmental economic analysis, it will be useful to take a concept of land capacity in terms of supported population. For tropical forestry management, it is worthy to compare the land capacity in various types of land use; for only commercial logging, for commercial logging with afforestation, for collection of only non-wood forest products, and for shifting cultivation.

As a result of a brief environmental screening of the project, it would not have considerable adverse impacts on most of the physical environmental items such as water, biological aspect, air quality, noise, waste products and natural disasters. But, some components of the project are likely or questionable to cause any environmental problems on this preliminary apprasal level, since the nature of this type of project has usually introduced tree species of which there is little ecological experience, lead to major conflicts with regard to existing land use and ownership of land, affected a significant land area, resulted in the direct

physical removal of significant volumes of soil, and involved the use of chemicals, pesticides or herbicides. Therefore, it is needed to especially focus on the following environmental aspects during formal feasibility studies and design :

1) Soil and land management (e.g. steepness of the terrain, land degradation, erosion of soil).
2) Ecological improvement and damage (e.g. impact of exotic species, used chemicals).

As for social effects of the project, resulting from a simple qualitative assessment, work patterns of a number of local people will be changed by the project via new employment opportunities created. And the project includes human resource development such as training for goverment agencies and business groups. So this project will have direct positive social impact, not negative ones.

10.2.9 Major Preconditions and Recommendations

In order to make this project successful, in particular, the existing information and data related to tropical afforestation development technologies as below should be smoothly gathered in the project preparation stage.

1) Mass-multiplication of seeds and saplings, and capsuling of seeds.
2) Manufacturing of least-cost pots.
3) Prevention of harmful insects, weeds and miscellaneous trees.
4) Improved machinery for afforestation.
5) Appropriate fertilizers and chemicals.

Part 3 Project Profiles

Code Number : A-1

1.	Project Title	: WHOLESALE MARKET DEVELOPMENT
2.	Location	: Southern Sumatra Region (Jambi, Palembang, Bengkulu and Bandar Lampung)
3.	Executing Agency	: Directorate General of Food Crops Agriculture, Ministry of Agriculture.
4.	Objectives	: - Establishment of food crop market facilities in major cities - Institutional development (municipal governments and the private sector).
5.	Project Description	: - To study the existing wholesale marketing practices in the major cities of the Southern Sumatra Region, and make an inventory of market-related infrastructural facilities thereof - To identify major infrastructural and institutional constraints to the effective functioning of the wholesale / retail network of food crops - To formulat proposals for developing market infrastructures and effective institutional arrangements
6	Project Duration	: 12 months
7.	Project Cost	: US$ 2,000,000
8.	Related to Project Aid	:
9.	Stage of Project Preparation	:

Code Number : A-2

1. Project Title : ON-FARM LAND DEVELOPMENT PROJECT

2. Location : Kabupaten Lahat (South Sumatra Province) and Kabupaten Bengkulu Selatan (Bengkulu Province)

3. Executing Agency : Directorate General of Food Crops Agriculture, Ministry of Agriculture,
: Directorate General of Water Resources Development, Ministry of Public Works.

4. Objectives : The objectives by development and rehabilitation of on-farm facilities in the existing irrigation schemes and village irrigation areas, are:
- maximization of land resources potential benefits,
- achievement of sustainable self-sufficiency in food crops,
- contribution of the soil conservation in the mountainous areas,
- creation of new employment opportunities, and
- contribution of poverty alleviation in rural areas.

5. Project Description : - Land Development (1,200 ha):
-- to execute the land development in existing irrigation schemes, and
--to rehabilitate and to improve existing tertiary systems.
- Village Irrigation Development (15,000 ha):
-- to expand the stable irrigated areas, and
-- to rehabilitate or upgrade the existing village irrigation schemes.
- Institutional Strengthening:
-- to train governmental staff and farmers,
-- to provide facilities/equipment for training, and
-- to support the farmer's group establishment and/or strengthening.
- Strengthening of Coordinating and Monitoring:
-- to train coordinating agencies staff, and
-- to support coordinating agencies activities.

6 Project Duration : Study: 12 months
Implementation: 5 years

7. Project Cost : US$ 12,900,000

8. Related to Project Aid :

9. Stage of Project Preparation : Pre-feasibility study has been made by this study. The EIRR is preliminary estimated at 20.7% (economically feasible). The project is also expected to contribute regional economy. No significant environmental impacts are expected because the project is rehabilitation or land development of the existing irrigation areas and the development areas in each irrigation system is small enough.

Code Number : A-3

1. Project Title : HIGH ALTITUDE HORTICULTURE DEVELOPMENT

2. Location : Pagar Alam (South Sumatra), Rejang Lebong (Benkulu), Kerinci (Jambi), and Lampung Barat (Lampung).

3. Executing Agency : Directorate General of Food Crops Agriculture, Ministry of Agriculture

4. Objectives :
   1) to improve farm management and quality control in vegetable cultivation
   2) to create new income-generating opportunities in agriculture and related activities
   3) to contribute to the better control of forest degradation and soil erosion in the mountainous areas through effective and intensive land use in high potential areas

5. Project Description :
   1) Selection of appropriate crops by identifying target markets
   2) Strengthening of extension services and establishment of demonstration plots
   3) Organization of farmers and institution of rural credit
   4) Strengthening of seed multiplication and regional distribution
   5) Establishment of effective and stable marketing arrangement, including the possibility of local agro-industry development

6. Project Duration : Study and planning 12 months
   Implementation 5 years

7. Project Cost : Study and planning US $ 3,200,000
   Implementation US $ 24,000,000

8. Related to Technical Assistance :

9. Stage of Project Preparation :

Code Number : A-4

1. Project Title	: UPLAND CROPPING SYSTEMS DEVELOPMENT IN HILLY AREAS	
2. Location	: Kerinci (Jambi), Lahat and OKU (South Sumatra), Rejang Lebong (Bengkulu) and Lampung Barat and Utara (Lampung).	
3. Executing Agency	: Directorate General of Estates, and Directorate General of Food Crops Agriculture, Ministry of Agriculture	
4. Objectives	: - To develop sustainable upland farming systems for hilly areas with appropriate land management techniques - To train extension workers and farmers groups in the appropriate methods of sustainable farm management	
5. Project Description	: - To undertake agronomic and socio-economic analyses of the existing farming systems in hilly areas in order to evaluate their long-term sustainability and to select appropriate sites for project implementation - To identify basic components of suitable cropping systems, including alley cropping of perenial crops (estate crops and fruits) and multi-purpose trees or shrubs, and appropriate contour management (e.g. terracing) - To expand the nursery facilities and equipment of the Provincial Agricultural Services of Estate Crops and Food Crops - To establish demonstration plots.for the training of extension workers and farmers groups	
6. Project Duration	: Study and planning Implementation	12 months 5 years
7. Project Cost	: Study and planning Implementation	US$ 2,000,000 US$ 12,000,000
8. Related to Technical Assistance	:	
9. Stage of Project Preparation	:	

Code Number : A-5

1. Project Title : TIDAL SWAMP CROPPING SYSTEM DEVELOPMENT
2. Location : Kabupaten Musi Banyuasin (South Sumatra province)
3. Executing Agency : Directorate General of Food Crops Agriculture, Ministry of Agricultural.
4. Objectives :
   - development of the on-farm drainage/irrigation infrastructures,
   - strengthening of agricultural support services, and
   - improvement of the social welfare of the farmers.
5. Project Description :
   - analysis of existing "Pasan Surut' land use,
   - identification of suitable cropping systems,
   - strengthening of agricultural extension,
   - improvement of seed production,
   - on-farm development,
   - improvement of pest control,
   - establishment of water user's associations and demonstration unit,
   - training of extension staff and farmers.
6. Project Duration : 5 years
7. Project Cost : US$ 3,800,000
8. Related to Technical Assistance :
9. Stage of Project Preparation :

Code Number : A-6

1. Project Title	:	CROPPING SYSTEMS DEVELOPMENT IN MARGINAL UPLAND AREAS	
2. Location	:	Jambi, South Smatra, Bengkulu and Lampung.	
3. Executing Agency	:	Directorate General of Food Crops Agriculture, Ministry of Agriculture	
4. Objectives	:	- To generate rural employment opportunities for poverty alleviation in marginal rural communities in the upland areas of the peneplains - To contribute to the establishment of sustainable low-input farming systems in upland areas of limited soil fertility - To strengthen local extension services	
5. Project Description	:	- To undertake edaphic, agronomic and socio-economic analyses of the existing farming systems in the hinterland areas between rivers of the peneplains - To identify basic components of suitable cropping systems, such as appropriate rotation of palawija crops and some horticultural crops on ladang areas including soil fertility management practices, integrated introduction of small-scale livestock keeping and leguminous forage crops, and the horticultural intesification on home gardens (pakarangan) - To establish demonstration plots.for the training of local extension workers and farmers groups	
6. Project Duration	:	Study and planning Implementation	18 months 6 years
7. Project Cost	:	Study and planning Implementation	US$ 3,000,000 US$ 16,000,000
8. Related to Technical Assistance	:		
9. Stage of Project Preparation	:		

Code Number : A-8

1. Project Title : POST-HARVEST TECHNOLOGY IMPROVEMENT

2. Location : Jambi, South Smatra, Bengkulu and Lampung.

3. Executing Agency : Directorate General of Food Crops Agriculture, Ministry of Agricultural.

4. Objectives :
   - to decrease post-harvest loss,
   - to improve the quality of crops for better marketability, and
   - to desseminate better post-harvest technologies.

5. Project Description :
   - to study of existing post-harvest technologies and facilities such as threshing, drying, milling and storing,
   - to recommend appropriate post-harvest technologies,
   - to propose the post-harvest facilities improvement plan,
   - to recommend suitable institutional supports for dessemination, and
   - to establish and inplement the pilot projects in strategic areas based on the findings and recommendation.

6. Project Duration : Feasibility study: 18 months
   Imlpementation: 4 years

7. Project Cost : Feasibility study: US$ 2,000,000
   Imlpementation: US$ 15,000,000

8. Related to Technical Assistance :

9. Stage of Project Preparation :

Code Number : A-9

1. Project Title : STRENGTHENING OF PROVINCIAL SEED MULTIPLICATION AND DISTRIBUTION SYSTEMS

2. Location : Jambi, South Smatra, Bengkulu and Lampung.

3. Executing Agency : Directorate General of food Crops Agriculture, Ministry of Agriculture.

4. Objectives :
- To improve the capability of secandary Crops seed production and distibution (Soybean, Maize, Peanut and mungbean) from breeder seed (BS) to Extension Seed (ES) in order to meet farmers requirement,
- To strenghen the seed instituion of secondary crops from up-steam to down- steam in order to guarantee the seed multiplication and distribution,
- To accelerate transfer of technology and carry out training for seed officials and private seed growers by introducing advance technologies on production, processing, distribution, storage and marketing of secondary crops high quality seed, and
- To improve the seed certification and quality control.

5. Project Description : The project comprises of:
- construktion of seed institution (national seed centre, seed farm, breeder seed processing unit and seed processing centres),
- provision of faciliteis for the seed institutionns (national seed centre, seed farm, breeder seed processing unit and seed processing, storage, distribusion of high quality seed),
- improvement of the secondary crops seed prodoction, processing and distribusion of qualifiend breeder seed, foundation seed, stok seed and extension seed,
- provision of training and guidance on advance technology to the porsennel concerned in the failds of seed prodoction, processing, storage distribusion, marketing and seed certification of quality seeds certification of quality seeds as well as to the farmers,
- strengthening the seed growers, and
- development of procedure of new varieties.

6. Project Duration : 5 years.

7. Project Cost : US$ 35,500,000

8. Related to Technical Assistance :

9. Stage of Project Preparation :

Code Number : A-11

1.	Project Title	: STUDY OF VEGETABLE AND FRUIT MARKETING
2.	Location	: Southern Sumatra Region (Jambi, South Sumatra, Bengkulu and Lampung)
3.	Executing Agency	: Directorate General of Food Crops Agriculture, Ministry of Agriculture
4.	Objectives	: - To establish a system of market information services - To contribute to the increased commercial-ization of vegetables and fruits
5.	Project Description	: - Collection and evaluation of the seasonal trends of vegetable and fruit consumption and prices in major urban centers, including the factory gate prices of agro-processing industries - Identification of a system of compiling and posting price and other market information - Provision of equipment for data handling and training programs for extension workers and contact farmers
6.	Project Duration	: 18 months
7.	Project Cost	: US$ 3,900,000
8.	Related to Technical Assistance	:
9.	Stage of Project Preparation	:

Code Number: A-13

1.	Project Title	: DEVELOPMENT OF SMALL HOLDER ESTATE CROPS
2.	Location	: Jambi, South Sumatra, Bengkulu and Lampung
3.	Executing Agency	: Directorate General of Estate, Ministry of Agriculture.
4.	Objectives	: - to raise the income and productivity in the traditional smallholder and the existing transmigrants areas by financing the planting/re-planting of high yielding varieties, and upgrading of farm management, - to expand and strengthen the smallholder sector export, and - to provide technical assistance to smallholder.
5.	Project Description	: - to plant/re-plant about 48,000 ha of rubber, - to plant/re-plant about 36,000 ha of coconuts, - to plant/re-plant about 24,000 ha of cocoa, and - to plant/re-plant about 12,000 ha of coffee.
6.	Project Duration	: 15 years
7.	Project Cost	: US$ 50,000,000
8.	Related to Technical Assistance	:
9.	Stage of Project Preparation	:

Code Number : A-14

1.	Project Title	: SMALLHODER TREE CROP MARKETING DEVELOPMENT
2.	Location	: Jambi, South Smatra, Bengkulu and Lampung.
3.	Executing Agency	: Directorate General of Estates, Ministry of Agriculture.
4.	Objectives	: - To improve on-farm post-harvest technologies - To foster the farmers' marketing organizations
5.	Project Description	: - To study the existing on-farm processing and marketing practices at the selected sites of smallholder tree crop development programs - To provide improved processing facilities or equipment to farmers' groups - To organize and train farmers' groups in quality improvement and joint marketing
6.	Project Duration	: 5 years
7.	Project Cost	: US$ 15,000,000
8.	Related to Technical Assistance	:
9.	Stage of Project Preparation	:

Code Number : A-15

1. Project Title	:	STRENGTHENING OF INSTITUTIONAL SUPPORTS	
2. Location	:	Jambi, South Smatra, Bengkulu and Lampung.	
3. Executing Agency	:	Directorate General of Estates, Ministry of Agriculture	
4. Objectives	:	To improve the management of programs for smallholder estate crops development	
5. Project Description	:	- To make an inventory of the existing project management units of estate crops (e.g. PRPTE, P4, and others) and evaluate the constraints of their functions and performances - To improve related facilities and equipment and institute training programs for the field staff and program-participating farmers. - To establish a computerized data base for better management of the programs instituted for smallholder estate crops development	
6. Project Duration	:	Inventory and evaluation Implementation	12 months 3 years
7. Project Cost	:	Inventory and evaluation Implementation	US$ 2,500,000 US$ 19,400,000
8. Related to Technical Assistance	:		
9. Stage of Project Preparation	:		

Code Number : A-16

1. Project Title : NUCLEUS ESTATE AND SMALLHOLDER DEVELOPMENT

2. Location : Jambi and South Smatra.

3. Executing Agency : Directorate General of Estate, Ministry of Agriculture.

4. Objectives :
   - to increase production of oil palm and rubber for local and export purpose,
   - to increase employment opportunity, and
   - to improve the standard of living of farmer participants by raising their income.

5. Project Description :
   - Nucleus estate develoment:
     -- planting oil palm and rubber,
     -- construction of oil palm processing facilities and down stream processing facilities, and
     -- construction of bulking facilities
   - Smallholder develoment:
     -- planting oil palm and rubber for smallholders, and
     -- development of houses and development of food crops areas for smallholders.
   - Technical assistence and program support:
     -- consultancy servies, and
     -- training for government staff and smallholders.

6. Project Duration : 5 years

7. Project Cost :

Total	US$	170,000,000
Local	US$	70,000,000
Foreign	US$	100,000,000

8. Related to Technical Assistance :

9. Stage of Project Preparation :

1. Project Title	: LARGE SCALE ESTATE DEVELOPMENT	
2. Location	: Jambi, South Sumatra, Bengkulu and Lampung	
3. Executing Agency	: Private investors.	
4. Objectives	: - to increase production of estate crops for local and export purpose, and - to create employment opportunities.	
5. Project Description	: - land development, - planting of estate crops, and - construction of processing facilities.	
6. Project Duration	: 20 years	
7. Project Cost	: Oil palm	US$ 5,500/ha
	Rubber	US$ 3,500/ha
	Cocoa	US$ 4,000/ha
	Hybrid coconuts	US$ 5,000/ha
8. Related to Technical Assistance	:	
9. Stage of Project Preparation	:	

Code Number: A-18

1. Project Title : STRENGTHENING OF VETERINARY AND ARTIFICIAL INSEMINATION SERVICES

2. Location : Jambi, South Sumatra, Bengkulu and Lampung

3. Executing Agency : Directorate General for Livestock Services, Ministry of Agriculture.

4. Objectives :
   - to increase efficiency of the animal health services by providing of vaccines antigens, diagnostics and drugs, and better disease control,
   - to define production constraints in smallholder livestock sector,
   - to develop a field program for improving livestock productivity in the smallholder sector,
   - to test samples from abatoirs for monitoring sanitary standard,
   - to study factors affecting the quality of meat and meat product, and
   - to improve the capacity of staff related to meat and its by product security.

5. Project Description :
   - procurement of laboratory equipment to improve the vaccine production, desease investigation and veterinary services,
   - provision of expertise, equipment and training to improve animal disease control planning,
   - provision of expertise and training programs on veterrinary epidemiology and economics,
   - evaluation of the disease control programs,
   - identification of the economically important disease, and
   - execution of the training to provide skill manpower either in field and laboratory works.

6. Project Duration : 5 years

7. Project Cost : US$ 6,400,000

8. Related to Project Aid :

9. Stage of Project Preparation :

Code Number: A-19

1.	Project Title	: BEEF CATTLE BREEDING CENTERS
2.	Location	: Jambi, South Sumatra, Bengkulu and Lampung
3.	Executing Agency	: Directorate General of Livestock Services, Ministry of Agriculture.
4.	Objectives	: - to increase provincial breeding capacities of beef cattle, - to develop regional breeding network, - to incresae beef cattle population and its productivity, - to increase farmers' income, and - to create rural employment opportunities.
5.	Project Description	: - establishment of the beef cattle breeding center in each province for maintaining the nucleus herd, - establishment of basic population of beef cattle surounding the each center to maintain the sources of elite female, - strengthenig of the regional beef cattle breeding center in Lampung province for producing beef cattle's frozen semen and frozen embryo, and - training of extension wrkers and farmers.
6.	Project Duration	: 5 years
7.	Project Cost	: US$ 20,000,000
8.	Related to Project Aid	:
9.	Stage of Project Preparation	: