B. Inter-IDEP Projects

1. Agriculture and Fishery

A-62

FEASIBILITY STUDY ON MARICULTURE DEVELOPMENT (RIAU) *

1. BACKGROUND

1.1. Project Area

The project will cover the Riau Archipelago and the Indragiri Hilir swamp.

(1) Riau Archipelago

The Riau archipelago is formed by numerous islands, which are surrounded by rich fish resources, particularly those of the South China Sea (Potential fish stock estimated by DGF: pelagic fish 195,000 MT; demersal fish 293,900 MT). Recent fish catch is about 46,600 MT, of which only 14,500 MT are caught in the South China Sea. The oceanographic and geographic conditions of the area are suitable for mariculture, i.e., marine fish cage culture and seaweed raft culture. The AARD's Coastal Aquaculture Research Sub-Center in Tanjung Pinang, in collaboration with Dinas Perikanan, has identified suitable areas; 350 ha for cage culture and 1,500 ha for seaweed culture. Recently, 2 private enterprises have started seaweed culture (both in Batam) and another 2 for fish cage culture (one in Tarempa and the other in Pulau Tujuh) under the NES system approach. In addition, several fishing companies operate purse seine and long-line fishing in the South China Sea, having a base in Tarempa.

(2) Indragiri Hilir

The coastal water of Indragiri Hilir has been largely exploited with intensive fishing (28,325 MT or 92.4% of potential marine fish stock), and thus the current fish

catch levels have been stagnating, particularly those of shrimps which used to be a star product to sustain the regional economy. On the other hand, there are huge potential areas suitable for brackishwater aquaculture as shrimp, shellfish and so on. According to Dinas Perikanan (Tembilahan), the potential areas include about 13,000 ha for tambak (brackishwater pond), 1,657 ha for kolam (freshwater pond), 2,300 ha for cockle culture. Such fisheries infrastructure as ice plant, cold storage and fish transportation equipment seems to be sufficient. With the development of aquaculture in this area, the existing infrastructure will be more utilized.

1.2. Project's Role

Fisheries is one of the major sectors supporting the economy of the project area. Fisheries activities have been historically developed taking advantage of close access to Singapore and rich fish resources. Because of the excellent location and potentiality for fisheries, the private sector's investments are expected to grow, and

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therefore the sector may have a possibility to self-develop in the future. In order to promote private investments in a sound manner, however, it will be necessary to provide adequate government support, particularly to small-scale fishermen/farmers, who may tend to be left behind in the course of development.

2. THE PROJECT

2.1. Objectives

The objectives of the Project are to increase export-oriented aquaculture production by strengthening supporting facilities in order to supplement the recent stagnant catch level of capture fisheries in the Malacca Straits, and to introduce an appropriate coastal water management system.

2.2. Project Components

Part A: Aquaculture Supporting Facilities

Component 1. Marine Fish Hatchery

The Project will include the establishment of a marine fish hatchery in Batam Island, to which the DGF plans to move the existing Mariculture Development Sub-Center in Tanjung Pinang. The species to be produced are sea bass (Lates calcarifer), brown-spotted grouper (Epinepherus tauvina) and other demersal fish species. Seed production technology of these marine fishes will be based on the records of research and experiments made at the AARD Coastal Aquaculture Research Center in Serang (West Java) and the DGF's Mariculture Development Center in Lampung. The hatchery will also have some fry nursery ponds/cages.

On the same site, a pilot-scale feed plant (1 ton/day) will be established in order to develop cheaper and more efficient feed (moist pellet) for marine fish culture.

Component 2. Giant Freshwater Prawn Hatchery

The project will include the establishment of a giant freshwater prawn hatchery in Singkep Island, located about 50km off the Sumatra main land. This hatchery will be called the Freshwater Aquaculture Development Sub-Center, Singkep. The production scale should be pilot-scale (about 20 million pieces of postlarvae 20/year).

Component 3. Marine Fish Fry Collecting and Distribution System

The project will include the establishment of marine fish fry collecting and nursery stations at 3 locations in Kec. Senayang. The stations will be managed by Dinas Perikanan. The stations will provide local fishermen with improved fry collecting technique and gear free of charge, and will purchase, nurse and distribute fingerling (5-7cm BL) mainly to the northern part of Riau archipelago. Furthermore, each station will be equipped with a speed boat (approx. 7m long) for communication and transportation use.

Part B: Farming Development

Component 1. Brackishwater shrimp Pond (Tambak Udang)

About 200 ha of tambak will be newly developed near Kuala Enok, Indragiri Hilir. The priority will be given to those flat areas where mangrove trees are felled by a chips factory, in order to reduce pond construction cost. About 100 artisanal land-less fishermen who are typically engaged in crab trapping and canoe fishing will be resettled on the new farming areas (2 ha/farm). Technical backstop including the procurement of feed and seed should be provided by Dinas Perikanan during the initial years and thereafter by cooperatives. One small-scale feed plant (1 ton/day) with a chilled room ($10m^3$) to keep feed fish will be established at the existing Dinas' demonstration farm site (Kuala Enok). It is expected that all output (about 280 MT of brackishwater shrimp per year) will be frozen for export at existing P.T. Karya Mina's refrigerating complex at Sungai Bela.

Component 2. Giant Freshwater Prawn Pond (Kolam Udang)

About 200 ha of giant freshwater prawn (Macrobrachium rosenbergii) ponds will be developed along irrigation canals in the vicinity of Tembilahan. The project farmers (about 200 households) will be selected from among land-holding rice farmers (1 ha/household). The culture pond will be made by converting some part of each farmer's rice field. The seed will be supplied from the proposed governmental hatchery in Singkep, and feed will be self-produced by farmers' cooperatives by using the waste of agricultural products and fishes. For this purpose, one small feed plant (2 tons/day) with a chilled room ($10m^3$) will be established at the site. It is expected that this project will produce about 320 MT of freshwater prawn per year, and that some of them are frozen for export to Europe and the rest for local markets.

Component 3. Seaweed Culture

Some fishermen in Kec. Senayang will be selected and organized into seaweed raft culture groups, which will be employed by some enterprises as plasma in the future. Original seed will be brought in from Lampung, but will be reused subsequently thereafter. Materials (bamboo) for rafts are available from Bintan Island. Four units of raft (5 x 3m) will be provided to one fisherman and about 50 fishermen will be organized into one group. Expected production from one group is 200 MT (wet) per annum. Output is expected to be processed at agar-agar (caragenan) factories in Batam and Medan.

Part C: Coastal Water Management

It is necessary to conserve coastal shallow water areas in order to protect the nursery ground for such important species as shrimps and some marine fishes. The introduction of shell fish culture of green mussel (Perna viridis), bloody cockle (Anadara granosa) and oyster (Crassostrea spp.) is the most effective way not only of protecting the nursery ground but also of earning additional income. The project will therefore include the preparation of model areas of coastal water management which are to be selected from among the identified potential areas for such shellfish culture; 3,000 ha for mussel culture and 10,000 ha for cockle ground,. The priority areas will be Kec. Mandah, Kateman, Tanah Merah and Kuala Indragiri. The model areas should be managed by fisheries cooperatives under the guidance of Dinas Perikanan.

3. SCOPE OF WORK

3.1. General

The Consultant will carry out a feasibility study of this Project reviewing the overall fisheries and aquaculture status of the project area, and prepare detailed basic design including the determination of the project scale, implementation plan and cost estimate.

3.2. Specific

(1) Aquaculture Aspect

The Riau archipelago is an ideal area for mariculture, but its development seems limited because seed and feed resources are not so large there. The availability of wild seed and feed fish necessary for cage culture development in the project area should be carefully analyzed, and if not enough, appropriate countermeasures, e.g., the establishment of hatchery and the development of substitute feed, should be considered by the Consultant.

As for the culture system (intensive, semi-intensive, extensive) to be applied to cage culture, seaweed culture, brackishwater and freshwater shrimp culture, the Consultant will assess the profitability of each case taking into account the farmers' technical level, environmental condition and so on.

(2) Engineering Aspect

The construction of tambak is usually costly, in particular in highly dense mangrove swamps. The construction cost, however, differs by the type of pond, which is usually determined by the culture system to be applied. Thus, the site evaluation and adequate pond design should be prepared fully assessing these points, so as to ensure a best return within the capacity of smallholders.

(3) Marketing/Infrastructure Aspect

The project area may not have serious marketing/infrastructural problem. At present, most of the exported fish/shrimp is once collected at Singapore, and then transshipped to various destinations. In this case, transportation cost to Singapore would be rather high if shipment volume is small. The Consultant will therefore carefully analyze freight cost based on the existing transportation network, and suggest a better method if necessary.

The assessment of live fish markets in Singapore, Hong Kong and other countries will be emphasized in the Project.

(4) Institutional/Manpower Aspect

The Consultant will assess the existing institutions related to fisheries, and suggest the due approach to strengthening cooperatives as a project operating body, and also examine possible government supports to them. The manpower aspect should include the analysis of the resettlement of land-less artisanal fishermen into farming activity.

(5) Environmental Aspect

The assessment of coastal environment is very important to forestry and fisheries; the preservation of the coastal green belt (50m from shore-line or 10m from river-side according to the

government's regulations) and the protection of nursery grounds of high-value fish species. The Consultant will consider how to keep and manage coastal environment in sound condition, in harmony with appropriate degree of development of aquaculture, particularly in relation with tambak.

(6) Socio-economic Aspect

Aquaculture is generally a family operation regardless of the type and kind of farming. In this regard, it is emphasized to reorient fishermen/farmers into aquaculture as their main- or side-job. It is particularly preferable to introduce land-less artisanal fishermen into tambak farming, island-located fishermen into seaweed/fish cage culture, and land-holding rice farmers into freshwater pond culture.

4. EXECUTION OF THE STUDY

4.1. Executing Agency

The executing agency of the feasibility study on the Indonesian side will be the Directorate General of Fisheries (DGF), Ministry of Agriculture (MOA).

4.2. Expertise and Man-Months

About 16 man-months of consulting services covering aquaculture economics, culture technology including hatchery, engineering, marketing and infrastructure, and credit/institution, will be required to carry out the feasibility study of the project.

4.3. Time Schedule

The study will be completed within 5 months after the commencement of the field services.

2. Industry

D-4

TECHNICAL COOPERATION ON DEVELOPMENT OF MARKETABLE HANDICRAFT PRODUCTS*

1. BACKGROUND

1.1. Location

The project will be located in some selected industrial clusters in the IDEP areas.

1.2. Project's Role in the IDEP Areas

There exist 111,065 units of small/cottage industries (the sub-sector)** in the northern part of Sumatra (the Region) which employ a total of 309,034 persons. Although the sub-sector's contribution to the regional economy in terms of production value is rather limited (26% of the sectoral total), its contribution in terms of employment is significant, accounting for 71% of the total employment in the all manufacturing establishments in the Region. The central government as well as the regional governments have continuously accorded the highest priority to the development of this sub-sector, as witnessed in the successive Five Year Development Plans (Repelita).

The contribution of these industries, actual and potential, is particularly important in the IDEP areas. In most of these areas, there exists a very small base of medium/large industries, which is not likely to grow so rapidly for some time in the future while other sectors are not expected to create employment opportunities large enough to absorb the under-utilized labor force. Many small/cottage industries are located in the depressed parts within the IDEP areas, where sources of additional income have to be found in order for them not to be left behind the economic take-off envisaged during the next Repelita period. This aspect is one of the highest priority targets of the current Repelita.

The government's programs of assistance to this sub-sector have been evolved over many years and at present they include, among others, BIPIC (guidance and training programmes), KIK/KMKP (credit schemes), and Bapak Angkat (assistance by large companies).

Among many difficulties faced by the small/cottage industries, such as financial, managerial, technical, and other problems, the difficulty in marketing has been identified through the experience of assistance for many years as the most crucial problem. That is, these industries do not have the capability to find niche markets and develop products to fit them.

This project is designed to address this problem especially in the aspects new to the expertise and experience of the existing cadre of the assistance programs. It is envisaged that this project will give considerable impacts on the development of the sub-sector in question.

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** Small/cottage industries are defined by the Ministry of Industry as those with investment in the production facilities below Rp. 700 million.

2. OBJECTIVES OF THE PROJECT

Objectives of this project are to widen the markets of selected small/cottage industries in the Region through market and product development and, ultimately, to increase the employment in these industries and raise the income of those engaged in them.

3. SCOPE OF WORK

Toward the end described above, the project will have following components.

- Services of junior experts in combination with that of senior experts.
- Fellowship for staff of Dinas Perindustrian (Office of Industry) at the levels of the Province and the Regency (Kabupaten) as well as industrialists.
- Provision of equipment for pilot manufacturing units, that for quality testing, etc.

There will be an arrangement for the junior experts to obtain assistance of senior experts from time to time. The project will be carried out in close collaboration with industrial research institutes, universities, large industries, etc. as appropriate. The general responsibilities of the junior experts are as follows:

- To identify products which could possibly find niche market from among those produced by existing industrial clusters.
- To liaise with prospective buyers/traders.
- To improve products to fit the market through necessary modifications (following suggestion of the prospective buyers).
- To improve production technology.
- To design and organize a system of production so that required quantity of the products with required quality at reasonable prices within acceptable delivery time could be ensured.
- To supervise the implementation of the above.

While the industries under consideration are dispersed widely in the Region, a number of them in the identical or similar line of business are located in geographical concentration, forming industrial clusters. It is proposed that the project will focus its assistance in selected industrial clusters, in view of achieving some success in the shortest possible time (this will be important for the project to gain momentum). Table below shows industrial clusters which have been preliminarily identified as the possible targets of this project. It is further suggested that the assistance will be initially concentrated in only one cluster in each of the selected industry groups which is most responsive and enterprising and thus most likely to bring about some success quickly (by the same token as above).

4. IMPLEMENTATION OF THE PROJECT

4.1. Executing Agency

The executing agency is Dinas Perindustrian of each Province under the supervision of the Ministry of Industry.

4.2. Expertise and Man-Months Required

The project will require the following expertise:

- Senior experts: Marketing
  Production Technology
  Rural Development

- Junior Experts: Marketing
  Industrial Design
  Production Technology

The total-man-months of the senior experts required are estimated at 10 and those of the junior experts at 240.

4.3. Time schedule

The project will continue for 2.5 years.

D-7

FEASIBILITY STUDY ON DEVELOPMENT OF INDUSTRIAL ESTATES/AREAS*

1. BACKGROUND

1.1. Location

The proposed industrial estates/areas will be located in Medan, Padang and Lhokseumawe.

1.2. Project's Role in the IDEP Areas

The industry sector in the Region has achieved an impressive growth in the recent years. In North Sumatra Province, the number of industrial establishments increased 4.4 times, employment 2.3 folds and production value 3.7 times during the 9 years since 1978/79. Realized private investments in industries in the Region amounted to US$6 billion for financing 275 projects between the year 1967 and 1987. These figures are only for BKPM approved projects and, therefore, there should have been many small/medium scale projects not counted in the above. As expected, a large portion of the new investments was concentrated in a few locations, namely, Medan and its vicinity and Lhokseumawe, etc. In the Medan area, due to the rapid expansion of the sector estimated at over 10% per year in the recent years, the shortage of industrial land is being felt and some conflicts with urban environment surfaced. Although not yet that level so far, other urban centers like Padang and Lhokseumawe will soon experience similar phenomena. Well planned industrial estates/areas are becoming a necessity in these cities.

2. OBJECTIVES OF THE STUDY

This project aims at examining feasibility of establishing industrial estates/areas in Medan, Padang and Lhokseumawe and promoting successful implementation of them. The ultimate objectives are to accelerate the industrial development in the localities and to ensure its harmony with the urban environment.

3. SCOPE OF WORK

The study shall cover;

(1) review of the economic development in the vicinity of the proposed location of the industrial estates/areas considered, paying particular attention to the industry sector.

(2) examination of the impacts of the above to the socio-economy and the environment of the vicinity.

(3) review of the government policies concerning (1) and (2) above and the establishment of industrial estates/areas.

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(4) examination of the investment opportunities for new industrial ventures in the vicinity, taking also the likely development of other sectors in consideration.

(5) identification of those which will find locating in the industrial estates/areas advantageous from among the opportunities identified in (4) above.

(6) assessment of investors' intention of actually investing in such ventures and locating them in the industrial estates/areas.

(7) identification of optimum mix of tenant industries and the size of the industrial estates/areas.

(8) identification of desired common facilities.

(9) identification of necessary infrastructures.

(10) selection of the possible site(s).

(11) basic design of the industrial estates/areas.

(12) examination of the economic and financial viability.

(13) examination of pricing policies for the land, building, services, etc. (including leasing/renting arrangement).

(14) identification of financing source(s).

(15) planning investment promotion activities.

(16) designing the organizational structure of the management of the industrial estates/areas.

4. EXECUTION OF THE STUDY

4.1. Executing Agency

The executing agency is Dinas Preindustrian (Office of Industry) of each Province under the supervision of the Ministry of Industry.

4.2. Expertise and Man-Months Required

The study will require following fields of expertise:

- Regional planner
- Industrial Economist
- Industrial Engineer
- Financial Analyst

The total man-months required to study the three industrial estates/areas are provisionally estimated at 30.

4.3. Time Schedule

The project will be completed within one year from the date when the assignment is started.

D-26,39,52,65

FEASIBILITY STUDY ON THE DEVELOPMENT OF AGRO-INDUSTRIES*

1. BACKGROUND

The agricultural sector bears the largest share of 23% of Indonesia's GDP in 1988 and constitutes the important mainstay to support the national economy. In addition, majority of the manufactured goods for export comes from agricultural products. During the Repelita IV period production of staple food crops (rice, soybean, corn and cassava) as well as export-oriented cash crops (coffee, cacao, rubber, oil palm and coconut) was strengthened. Horizontal and vertical diversifications in the agricultural sector have been stressed (i) to make exporting profits through production increase in rubber, coffee and palm oil (ii) to improve food security through production increase in rice, corn, soybean and groundnuts, and (iii) to improve national nutrition through production increase in livestock products, vegetables and fruits. Acceleration of such diversifications will remain one of the main strategies adopted in Repelita V.

Export-oriented cash crops have been dealt with as raw materials and/or primarily processed materials at their best, of which the commodity price used to fluctuate depending on the international market demand. To cope with such risky fluctuation of the international market prices of agricultural commodities and to stabilize cash income of the grower, secondarily or further processed commodities seem advantageous to secure cash flow into the national economy.

2. THE PROJECT

The project consists of the establishment of all or part of the following seven agro-industrial plants:

Seed-Oil Plant
Cassava Starch Syrup Plant
Margarine Plant
Tomato Ketchup Plant
Fruit Juice/Jam Plant
Toilet Soap Plant
Animal Feed Plant

(1) Seed-Oil Plant

Soybean, corn, groundnuts, sesame, rapeseed, and rice bran are sources of vegetable oil and fat. Oil and fat in seeds are extracted mechanically by means of pressing (expeller or screw press) after the prepress solvent process. Low oil concentration seeds, such as soybean, corn and rice bran, are processed by means of direct solvent extraction.

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The proposed plant should be established at a site where raw materials are easily obtained and processed oil can easily be distributed.

Breakdown of the project components are as follows:

Building components

- Processing hall
- Administration office
- Storages

Equipment components

- Mechanical press unit
- Solvent extraction unit
- Continuous extraction unit
- Refining unit
- Vehicles
- Others

(2) Cassava Starch Syrup Plant

Use of low-price material is priority requirement for the starch hydrolyzing industry. Accordingly, the industry usually uses potato starch rather than corn starch because of the low price of potato starch. But cassava starch seems most preferable because its price is the lowest among the three materials.

The plant is operated by means of the malt syrup making system which is able to produce 1-2 tons/day using approximately 2 tons/day of cassava starch.

Breakdown of the project components are as follows:

Building components

- Processing hall
- Administration office

Equipment components

- Dipping tank
- Germination tank
- Malt dryer
- Malt storage tank
- Starch regulating tank
- Pumps
- Cooker
- Converter
- Deactivator
- Packing machine
- Boiler
- Vehicles

(3) Margarine Plant

After a long history of research and industrial trial since the late 19 th century, it has become possible to produce margarine from various kinds of oil/fat from vegetables/animals. An improvement of

oil refining techniques has made it possible manufacturing high quality margarine as natural as genuine butter.

Principal ingredients used for margarine manufacturing differ by country, however. Soybean, cotton seed, corn, coconut, oil palm seed, rapeseed, fish and livestock animal are all possible materials. In general, blending of ingredients mixture of fish oil, soybean oil, palm oil, beef tallow, lard, coconut oil, cotton-seed oil and others has become a common practice. These ingredients are abundantly available in Indonesia. Home-made margarine is really one of the most probable import-substitutes.

Breakdown of the project components are as follow:

Building components

- Processing house
- Warehouse
- Administration office
- Laboratory
- Others

Equipment components (Capacity 850 ton/m)

- Decolovation unit (tank, accessory, etc.)
- Decolovation unit
- Hydrogenation unit
- Deodorization unit
- Sterilization unit
- Tanks
- Others (generator, waste-water treatment, etc.)
- Vehicles

(4) Tomato Ketchup Plant

Consumption of secondarily processed tomato products such as tomato ketchup and tomato juice has become very common in our dietary habits; in home kitchens and restaurants, they are almost ubiquitous.

Tomato can be grown all year round, and the successful progress of the crop diversification program in Indonesia will make it possible to produce a good amount of qualified tomato for tomato ketchup manufacturing. High altitude arable land in Northern Sumatra ,in particular, would be the most promising tomato production area.

What concern the manufacturer most are quality of tomato used as raw material and availability of a large amount of washing water required during the short period of harvest time, a month or so. In other words, possibility of manufacturing tomato ketchup depends on the quality of tomato and water the availability of the tomato ketchup production is a typical seasonal industry which is closely related to agriculture.

Breakdown of the project components are as follows :

Building components

- Processing house
- Warehouse
- Boiler house
- Administration office

Equipment components

Charging/washing/sorting unit
Concentrating unit
Homogenizer
Mixer
Bottling unit
Labeller
Packing machine
Others (waste water treatment, etc.)
Vehicles

(5) Fruit Juice/Jam Plant

Consumption of concentrated natural fruit juice and jam has been increasing tremendously supported by a remarkable advance in packing technology. One advantage of canned/paper-packed/bottled drink or packed jam is its long life without being refrigerated. As for materials, orange, tomato, pineapple, passion fruit, banana, etc. are all available with ease. Keeping natural flavour, colour, and taste of the original fruit materials is the major concern in making juice/jam. Advanced manufacturing technology has made it possible by means of pasturization process, freezing-concentration process, cut-back and add-back process, vacuum concentration method, and so on.

Breakdown of the project components are as follows :

Building components

Processing house
Warehouse
Administration office
Laboratory
Others

Equipment components (Capacity 850 ton/m)

Conveyers
Tanks
Pumps
Screener
Peeler
Hoppers
Pulper
Heat exchanger
Centrifuge separator
Others
Vehicles

(6) Toilet Soap Plant

Soap is indispensable to our daily life, and a large quantity of soap is used for housekeeping purposes. Though synthetic detergent is increasingly used in these decades, demand for toilet soap has remained high.

Such as tallow, coconut oil, palm oil, and additive ingredients are used for the toilet soap manufacturing. All of these oil ingredients are very common agricultural products in northern Sumatra.

Breakdown of the project components are as follows :

Building components

Processing house
Warehouse
Administration office
Laboratory
Boiler house

Equipment component (Capacity 5 ton/day)

Saponification equipments
Vacuum drying unit
Soap shaping line
Others
Vehicles

(7) Animal Feed Plant

Demand for animal feed will increase since livestock development programs are going to extend to small-scale or large-scale operation. In the case of the planned "Cattle Fattening Project" in Aceh Province, something like assorted animal feed, mixture of hey and rice bran, has been introduced since October 1988. There is a big hope that the demand for assorted animal feed will grow as northern Sumatra becomes an animal meat producing region in the nearest future.

To produce assorted animal feed, such raw materials as corn, milo, rice bran oil-lees, soybean oil-lees, vegetable oil-lees, mash, fish meal, oil and fat, and other additives are usually used. These ingredients are also very common agricultural bi-products in northern Sumatra.

Breakdown of the project components are as follows :

Building Components

Processing house
Warehouses
Administration office

Equipment components (Capacity 850 ton/m)

Silo
Hoppers
Pellet making machine
Packing machine
Tanks
Boiler
Others
Vehicles

3. OBJECTIVE OF THE STUDY

This Agro-Industries Development Project, a complex project consisting of individual plant construction works, has been formulated to promote home-made import-substitutes. Each component may be handled independently to formulate specific projects which suit local circumstances.

Feasibility of the project as a whole and of individual plants should be carefully determined by means of economic project analysis.

4. SCOPE OF WORK

Taking into consideration the generation of job opportunities and cash income as well as the betterment of nutrition of local people, a small-and medium-scale manufacturing/processing plants seem appropriate wherever the manufactured/processed products have some prospects of entering local and international markets. Raw ingredients for the manufacturing/processing should be locally available agricultural commodities and, hopefully, the manufactured/processed goods should be import-substitutes in the initial stage. Possibly in the nearest future some of the home-made goods will attain export quality, while others can be exported from the beginning. The development will much on program implementation and the national economic growth.

These present and foreseeable conditions should be taken into consideration for feasibility analysis.

In this connection, items to be studied by the feasibility study team are :

- to clarify progress of agricultural products in quantity and quality with/without diversification policy,
- to clarify supply-demand conditions of agriculture related commodities in local/foreign market,
- to clarify the transportation network/linkage in reference to domestic/international marketing,
- to clarify knowledge/technology on plant O/M,
- to clarify existing facilities and production capacities of agriculture-related industry
- to clarify socio-cultural cuvironment and farmers' references,
- to clarify organization/function of local/cential governments and role of private agencies concerned,
- to identify appropriate sites for plant construction,
- to clarify the regulation matter in relation to development of agro-industry, and
- to make economic project analysis.

5. EXECUTION OF THE STUDY

The responsible executing agency will be BAPPEDA.

Required experts, fields of expertise, and man-months for the feasibility study of the seven plants are as follows :

Economist (Team Leader)	10	m/m
Food Science Specialist	6	m/m
Food Processing Specialist	6	m/m
Agronomist	6	m/m

Plant Operating Engineer	10	m/m
Market Analysis Specialist	10	m/m
Total	48	m/m

All experts are required fielding for 4 months and the remaining man-month will be spent in home-office work. Time schedule for the study will be determined taking into consideration the program priority to be set for each IDEP.

3. Energy/Power

E-1

STUDY ON FUEL EFFICIENT STOVE DISSEMINATION*

1. BACKGROUND

1.1. Program Area

This program will cover the whole northern part of Sumatra (all IDEP areas are to be covered with the initial program starting in South Tapanuli).

1.2. Program's Role

Fuel wood characterizes the household energy supply/demand in the region, whereas commercial energy such as LPG, kerosene and natural gas are available for just a limited number of household in the urban population. This main source of household energy, fuelwood is also consumed in the brick, tile and foodprocessing industries.

With the outcomes of field survey during "the Integrated Regional Development Plan for the Northern Part of Sumatra" and the available traditional energy studies, the followings are revealed:

(i) The per capita consumption of fuel wood is estimated as 0.36 m^3/year.

(ii) Over 75% of the total population in the region are depending on this energy and occupies 85% of the total fuel wood use against industrial use of 15%.

(iii) The biomass, mainly fuel wood contributes 44% of the total regional energy consumption (about 16,000 BOE.)

The overall national situation on the fuel wood use draws the almost same picture. The supply and demand balance for the fuel wood at the provincial level in the region presently seems adequate. However at the district level, it shows sign of potential shortage with increasing prices for fuel wood. Given the estimated population growth and the increase of the number of households with upward trend of household energy use along with rise of income level, the sustainability of the current fuel wood situation is questioned. In further in view of energy resource availability for household income level, it is difficult to envisage that the transition from traditional to commercial energy will take place next 10 years.

In these instances, efforts should be directed to enhance the thermal efficiency in fuel wood use in the rural household. The currently wide use fuelwood stoves are the open fired type with extremely low energy efficiency. The related studies show the efficiency of such stoves is mere 5 - 8%, in comparison to 24% by the efficiency improved strove. With the dissemination of the improved

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stove, the current level of fuelwood consumption is possible to be reduced to 1/2 to 1/3.

The dissemination of the improved stove could also complement betterment of the life in the rural population especially for women and children. It is the work for women and children to collect the fuelwood and to cook. The results of the case study for West Sumatra villages in 1983 shows that the time spent in fuel wood collection is 6.6 manhours/week and the time spent for cooking is 4.2 manhours/day. With the introduction of the improved stove, the more time for other work on study would be available.

2. OBJECTIVES OF THE PROGRAM

The goal of this program is to assist the GOI in formulating and implementing the efficiency improved stove dissemination program with strategic action plan towards commercialization.

The direct objective of the Program is to rectify the inefficient way of fuel wood consumption by at least twice better. As a result this program aims to make more time available by reducing the fuelwood collecting and cooking time.

The improved stove acceptance may lead to drastic habitual changes (i.e., way of cooking, ingredients preparation, etc.) which work as a constraint for effective dissemination. In this context, social factors should carefully be considered and clearly be addressed so as the dissemination program to incorporate these factors in its program elements as well institutional involvement in the program.

3. SCOPE OF WORK

3.1. General

The proposed program is divided into three phases. Phase 1 is designed to carryout test marketing with free of charge dissemination of the said stove. Phase 1 would also establish the data requirement, approach and organizational structure for the stove dissemination program as well as to identify the target volume and priority program areas.

Phase 2 will be designed to formulate the dissemination program and to implement the program in an order set in Phase 1. The results of Phase 1 are evaluated in view of commercialization of the program and Phase 2, then, will furnish strategic action plan for commercialization with clear investment and manufacturing options.

3.2. Major Steps of Work

Phase 1

Step 1. Review the state of existing fuel efficient stove in Indonesia including the data on stove efficiency and design, manufacturing and marketing aspects (costs and prices), and socialization. Within this context, conduct a literature review of relevant reports addressing the improved stove dissemination issues locally and internationally. Also conduct a review of past and present activities in Indonesia relating the promotion of the stove. The result of this step should be a clear definition of the adequacy or inadequacy of stove design, method of introduction of the stove, and crucial elements of the dissemination program.

Step 2. Based on information collected in Step 2 and on knowledge of efficiency of cookstoves with laboratory testing, set out the test marketing frame. Test marketing should provide information on performance and acceptability of the selected stove, as well as data on pricing, promotion, distribution, and the stove itself. The text marketing should hold two scheme of free of charge dissemination and priced stoves marketing.

Step 3. Select the ten villages from the region with knowledge of degree of fuel wood availability and perform the test marketing.

Step 4. Monitor and evaluate the test marketing. The outcome of this step should be clear definition of major constraints inhibiting the adoption of the stove.

Step 5. Review potential manufactures and suppliers. The assessment should leads to economically feasible option.

Step 6. Having above informations, specify target volume and priority program areas.

Phase 2

Step 7. Based on the results of Phase 1, formulate the dissemination program, where region specific volume of stove dissemination, the system of supplying stoves, the means of promotion for adoption of the stove and institutional development strategy should be clearly defined. This step should provide a financing system for manufactures, suppliers and users.

Step 8. Prepare guidance to manufactures, suppliers and users for the implementation of the most effective cookstoves with due attention on institutional development for the program.

Step 9. Calculate revolving fund necessary for the implementation and dissemination activities and formulate financial program.

Step 10. Assist and facilitate the implementation program in view of achieving smooth coordination among related institutions and organization.

Step 11. Perform initial evaluation of the program implementation for possible refinement of the program and recommend transfer of management responsibility of the program from the national level to the provincial level in view of wider dissemination of the stove.

4. EXECUTION OF THE STUDY

4.1. Executing Agency

The institution which will be responsible for the implementation of the project is Directorate General of Electric Power and New Energy through the cooperation with other government institutions (Directorate General of Rural Development-Bangdes, Ministry of Cooperation, BPPT, and the Ministry of Industry) as well as nongovernmental.

4.2. External Expertise

Phase 1 of the program will require the following expertise:

Energy planning specialist

Appropriate technology specialist

Sociologist

Biomass specialist

Financialist

Local consultants

4.3. *Time Horizon for the Program, Manpower Requirement and Budget*

Duration of 1.5 years is expected for the program with total requirement of 32 man-months. The total budget requirement is envisaged as $75,000.

E-2

STUDY ON ACCELERATING RURAL ELECTRIFICATION PROGRAM*

1. BACKGROUND

1.1. Location

This program will cover the northern part of Sumatra (all IDEPs are included).

1.2. Issue Statement (National Context) by the Government

The objective of power sector development of Indonesia's (GOI) Broad Outline of State Policy, is to improve the welfare of the population in both rural and urban areas and to support and stimulate economic activities. PLN has been connecting customers though, the results are the uneven distribution of electricity in rural v.s. urban areas with total households connection rate of 17% in 1988.

For this country where 78% of the total population resides in rural area, rural electrification (RE) is a challenging task, in view of 21 million households left for electrification. RE is always difficult achieve adequate financial return, especially in its initial stage. PLN's operating expenses has been exceeding its revenue from the sales, which leads to difficulties in managing the electricity supply program. Main cause of this deficit operation stems from the PLN's RE program. RE has been the major financial drain on PLN and expansion of RE program in massive manner will certainly worsen the PLN's financial condition. In addition capital expenditure to finance PLN's RE program is growing so large that it certainly gets resource constraints. During Repelita V, RE investments requirement is estimated to occupy 23% of the total projected investments for PLN in comparison to that of 19% during Repelita IV. (It is estimated that the RE absorbed 4% of public investment during Repelita IV). These magnitude and difficulty associated with RE leads to formulation/implementation of a strategy to manage the targeted figure of total household electrification and coordinate comprehensive set of actions required to take advantage of available options for RE.

These magnitude and difficulties associated with RE leads to the total electrification target at less than half of the population ten years from now. This electrification ratio is far lower than those of neighboring countries, such as Malaysia's 72% in 1983, Thailand's 60.2% in 1986.

In these instances, GOI should consider to formulate and implement a strategy to manage and coordinate comprehensive set of actions required to take advantage of available options for RE.

Currently RE consists of three types of electrification systems. The foremost and large part of RE programs are carried out by PLN, which serve about 4 million in 1988. Ministry of Cooperatives and some

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provincial governments also carry RE but their contribution is limited and serve mere 40,000 households. The third type is the informal RE operation by initiative of individual entrepreneurs at village level. This third type RE is operated unsafe manner and quality of service is not suitable to stimulate productive users though, almost the same number of villages are reported to have services of this kind.

The sources of power for these RE are mainly by diesel and very smaller extent by micro hydro. In view of long term national energy out look where no exportable surplus petroleum will be left unless alternative energy resources are utilized, it is difficult to project RE by current system of scattered diesel. In this context expanded use of New and Renewable Energy Resources (NRER) mainly biomass with abundant annual endowments is considered to complement the development of RE. Despite the Repelita IV energy policy guideline which explicitly mentions the needs of exploring the potential of local biomass resources, there has not yet developed a comprehensive strategy for utilization of such resources. This partly due to range picture on the supply, consumption and disposal of biomass resources. Thus the comprehensive biomass utilization strategy is required in view of regional assessment of current and potential endowments in relation to the possible use in RE.

1.3. Regional Context

The above mentioned issues related to RE also hold true for the Northern part of Sumatra. The current total household electrification rate by PLN is reported as 25% and in 1998 it is targeted by each village of PLN to double that number. In reviewing the past achievement of individual villages in the Region, those targets seems too ambitious, however, it is necessary to reach to that level of electrification from the point of view of regional development goal and equity point of view. "The Integrated Regional Master Plan" sets the target of electrification in the year 2008 at 90% for the Region with a strategic scenario of implementing RE.

The scenario of electrification in the study is to utilize current set up for RE with introduction of decentralized system of utilizing locally endowed resources for RE at first and in the later stage those systems are connected in view of scale of economy for satisfying the increased demand. In this way PLN can concentrate on the grid extension electrification at possible extent with adequate financial returns in relation to its own expansion plan. At the same time, by promoting RE by other institutional set up different from PLN with locally endowed new and renewable energy resources in the isolated rural areas, where PLN grid extension is economically unfeasible, the RE should be able to be accelerated.

The prolification of unregulated non PLN operation is the evidence of organizational skills and technical capabilities that could be channelled into higher quality services. In addition in the Region there exists a vast potential availability of new and renewable energy resources especially biomass associated with wood products, palm oil, coconut oil, paddy production plans in the Region as suggested by the Study.

Thus the required is the comprehensive strategy to connect and coordinate those potentially available resources not only energy resources but also human and financial resources for the challenging task of rural electrification in the Region.

In utilizing new and renewable energy resources, proven technologies are already available in Indonesia by efforts undertaken by governmental agencies, universities and the private sectors, but the commercializing or financial viability proof of such technologies are still limited. In pursuance of the above said strategy, examination of financial viability on RE by new and renewable energy are required with actual implementation.

The magnitude and complexity of challenge combined with identified opportunities and weakness in the current system for the pursuit of RE, justify the proposed program.

2. OBJECTIVES OF THE STUDY

The main objective of this program is to assist the GOI in developing and implementing a coordinated strategy for acceleration of rural electrification in the Northern Sumatra region. In pursuing this objective, the study also aims utilization of economically and environmentally acceptable use of new and renewable energy resources to meet the vast needs of electrification as well as reaching recommendation for institutional reform. In this context, with actual implementation of rural electrification projects, in utilization of the said resources, the specific issues to be addressed are:

(1) Identifying and defining the available new and renewable resources which could be effectively utilized as energy resources for rural electrification;

(2) Identifying current and projected electricity demand which could technically and economically be met by the said resources in relating to the dependability of electricity supply in its quality and stableness;

(3) Analyzing the policy, institutional, social and logistical constraints in realization of the technically and economically viable opportunities;

(4) Examining the commercial and economic performances from the actual application of such resources utilization scheme for rural electrification with comparative analysis to the grid base electrification;

(5) Specifying the technical, institutional, financial, and human resources necessary for accelerated application of new and renewable energy resources for rural electrification; and

(6) Outlining a policy, institutional set up, and investment strategy for the realization of accelerated electrification by use of new and renewable resources to meet the electrification objectives while ensuring maintenance of social and environmental objectives.

In further on the basis of the current institutional framework for RE, there is a room to strengthen some institutional elements for actualization of accelerated RE. This institutional aspect has already been mentioned in the report "Indonesia Rural Electrification Review" by the World Bank in 1986. The crucial institutional elements envisaged are; i) leadership/responsibility for RE, ii) financial arrangement, iii) charting system for subunits RE, iv) training/technical assistance scheme, v) the system of tariff regulation.

The proposed program should enlighten these institutional considerations and provide concrete recommendation for justification of institutional reform with regard to RE.

3. SCOPE OF WORK

3.1. General

The proposed program is divided into three distinct phases. Phases I is designed to determine if there is a real viability and benefit for a coordinated new and renewable energy resource utilization strategy for electrification in the Region. In turn Phase I would establish the frame for development of viable strategy satisfying with data requirement, approaches, and organizational aspects. After this assessment of opportunity for the coordinated utilization strategy, Phase II will carry implementation of several new and renewable energy electrification projects with commercialization scheme, and furnish performance evaluation results. Then Phases 3 should be able to address specific resource oriented electrification scheme priority and effective coordinated strategy in utilization of new and renewable energy resources with due to concern impacts to the acceleration of the electrification. These efforts in Phase III should also systematically define economic and commercial opportunities with specific new and renewable energy resources with recommended institutional set up resulting a clear delineation of investment options to realize such opportunities.

3.2. Tasks for the Action

Phase I.

The following tasks are proposed to achieve the objectives of Phase I.

Task 1: Review the state of existing new and renewable energy resource use for electrification in Indonesia with due attention on supply, demand and consumption. In this context, also review relevant report and literature so as to determine the degree to which issues pertinent to utilization of new and renewable resources for electrification. In addition conduct a review of past and present programs and activities in Indonesia. This task should then result in evaluation of existing programs, reports, projects etc. for defining and promoting efficient utilization of resources for RE.

Task 2: Based on information collected in Task A with knowledge of new and renewable energy resources utilization options set out the options available in the Region. Indicate the degree to which options are promoted in the Region.

Task 3: Review existing and projected power demand and its characteristic in the Region and determine the extent to which options identified in Task 3 could technically contribute to meet the regional demand. Identify the major constraints associated with introduction of such options.

Task 4: Prioritize the opportunities for RE program by new and renewable resources based on technical potential, economics, institutional constraints and regional development objectives, and evaluate the test projects. The assessment should include the degree to which options are technically proven and

economically feasible and commercially possible. Then the projects below should be prioritized for implementation.

Task 5: Set out the frames for implementation of the options identified and test projects mentioned below for financial sustainability delineate the work plan in detail. It should include organizational approach, investment, and tariff collection strategy.

Phase II

Task 6: Implement the test projects

Task 7: Monitor and evaluate the test projects in technical, economic, institutional social and environmental aspects. The outcomes of this task should be clear definition of major constraints inhibiting introduction or wide dissemination of the project scheme as well as refinement of the said systems for RE.

Task 8: Reprioritize the opportunities identified in Task 4 with necessary actions for improving for performances of the options.

Phase III

Task 9: Prepare guidelines for application of such options in the other parts of the Region as well as other parts of the nation. Formulate a plan for coordination of research activities and seek the domestic material procurement system for components of the system for RE in utilization of new and renewable resources.

Task 10: Clarify the certain contribution of new and renewable energy resources for RE in the Region.

Task 11: Recommend socio-economic financial, institutional arrangement for utilization of new and renewable energy resources.

Every task should involve counterparts in view of technology transfer and the significant role that new and renewable energy play in this country.

3.3. Possible Projects for Implementation in View of Testing the Commercialization Viability

(1) Micro hydro - South Sijunjung IDEP

Due attention should be paid on resposibility, demarcation of work for implementation operation, and financing of the project under currently considered cooperation scheme among DGENE, Ministry of cooperative and PLN. The implementation of this project should provide concrete recommendation on the above issues as well as on how this scheme implemented in massive scale.

(2) Biomass utilization

Rice husk utilization: Nias, West Aceh IDEP

Palm oil residues utilization: East coast North Sumatra, West Aceh, Indragiri IDEP

Coconut husk utilization: Nias, Indragiri IDEP

Biomass procurement system should gather due attention especially for off peak production of agro products. Economy of scale in generation and organizational set up for operation also require careful evaluation.

(3) New energy utilization

Photovoltaic energy: Nias, Mentawai, Riau islands

Wave power: Mentawai

In case of photovoltaic power supply project the degree of quality of supply required should be considered so as to seek the possibility of investment cost reduction.

In case of wave power, the project is characterized as BHN assistance to serve minimum demand , however, multiple utilization of the system component as break water or a port facility should carefully planned.

(4) Mini hydro - possible areas in the Region

Economic rate of return for rural electrification varies according to the number of houses interconnected. It is necessary to explore options for increasing within village electrification rate as well as options for mobilization of non-PLN resources to increase efficiency in investments.

4. EXECUTION OF THE STUDY

4.1. Executing Agency

The proposed action will be undertaken by the Directorate General of Electric Power and New Energy (DGENE) with overall responsibility for the program. Execution of the program, especially in Phase I, however, should be supported by inter-ministerial committee on electrification (IMCE) similar to Inter-Ministerial Technical Committee on Energy (IMTCE), which consists of the Ministry of Science and Technology, Ministry of Forestry and Ministry of Agriculture. IMCE should include Ministry of Cooperatives and PLN in addition to the members of IMTCE and be chaired by DGENE as same as IMTCE. The results of Phases I and proposed efforts for Phase II will be discussed with the members of IMCE.

In Phases II, directly related ministry should play a focal counterpart role in project execution while DGENE should play an evaluator role of the actual implementation so as to utilize those results for future policy development. In Phase III the program should undertaken by the same outset of Phase I.

Currently DGENE is submitting the proposal to BAPPENAS to establish a "Center for new energy studies and development," where commercialization of proven technologies and strengthening the planning/designing capability for the new and renewable energy projects are aimed. The proposed program here them could be combined with this DGENE proposal to establish a center for research and development of new and renewable energy utilization. If these proposal were to be combined together, the program described here would be placed as the initial base activity for the new center.

4.2 Expertise and Man-Month

Phase I

The following expertises are deemed necessary with total of 32 man-months.

Energy planner
Energy/environmental economist
Power specialist
New energy specialist
Biomass energy specialist
Local consultants

Phase II

Subject to the outcome of the Phase I though, at least 6 projects are to be implemented. The expertise in each project should consist of the following inputs at minimum:

Energy planner;
Appropriate technology specialist;
Socio-environment specialist;
Local consultants; and the overall.

Management of the all the projects should be governed by the program manager (energy economist). The overall expert service would amount to 250 man-months.

Phase III

The following expert services are required with the total 20 man-months.

Energy planner
New energy specialist
Renewable energy/environment specialist
Industrial specialist
Socio institutional specialist
Local consultants

The grand total expertise requirement is considered as 302 man-months. Equipment assistances are envisaged as follows:

Photovoltaic	US$ 500,000
Gasfier for coconut husk	300,000
3.2 MW power system by palm oil	4,000,000
270 kw power system	2,000,000
(with carbonized husk for soil improvement as by product)	
Wave power of 30 kw	1,000,000
Micro hydro of 40 kw	70,000
	US$ 7,870,000

Since the equipment costs amounts rather high, donor coordination may necessary, and the project which is directly related to commercial operation, should be subject to soft loan (in case of utilization of palm oil residents and rice husks).

4.3. Time Schedule

This program should start as soon as possible. The total duration of program implementation is anticipated for 2.5 years, in which Phase I occupies 4 months, Phase I will require 22 months and Phase III 3 months.

4. Transportation

F-1

FEASIBILITY STUDY ON ARTERIAL ROAD UPGRADING*

1. BACKGROUND

The Government of Indonesia has been emphasizing the development of road infrastructures to strengthen the country's economic structure in each of its four Repelitas.

During Repelita IV, the Directorate General of Highways (Bina Marga), the Ministry of Public Works of Indonesia determined to establish road networks throughout Indonesia and focused on implementation of rehabilitation and maintenance of existing road networks. The policy of road development has been to improve only the existing road networks to stable conditions due to financial constraints.

There is now a need for upgrading of formerly neglected bottleneck of road sections. In addition, elimination of dangerous slopes in cut and embankment will reduce the risk of road users and enhance the safety level. Besides this, it could be said that arterial road network in Sumatra is very important to exploit natural resources and to tap the development potentials in the area.

In the "Study on the Integrated Regional Development Plan for the Northern Part of Sumatra (LTA-78)" by JICA in 1990, the arterial road upgrading project in Sumatra is proposed as one of high-priority projects during Repelita V.

Under such circumstances, it is recommended to carry out the feasibility study on Arterial Road Upgrading Project to confirm technical and economic feasibility of the project.

2. OBJECTIVES OF THE STUDY

2.1. Objectives

The objectives of this study are:

(1) To execute a preliminary study for the rehabilitation of road sections of strategic roads which fall far below the practical road design standards of arterial roads, hindering smooth and safe traffic movement,

(2) To execute a feasibility study to establish the priorities of improvement plan among the strategic roads and to formulate improvement program for road sections of high priority.

2.2. Proposed Roads

The project roads included in the study will cover strategic roads among the arterial roads in Sumatra, which are expected to contribute to the enhancement of socio-economic activities in the region.

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3. SCOPE OF WORK

The study comprises the following two (2) phases:

Phase I : Preliminary study
Phase II: Feasibility study

3.1. Phase I

(1) Data collection and review

Management system, screening system, data collection system, road and bridge inventories, and other information related to the study shall be collected and analyzed.

(2) Field surveys

Field survey of road and traffic conditions shall be conducted along the study roads.

(3) Review of the current practice of road betterment

A review work shall be carried out about the road betterment strategies ever applied under the external financial aid projects.

(4) Review of road design standard

Present road design standards shall be thoroughly reviewed.

(5) Establishment of criteria

Engineering criteria shall be established for the study of identifying deficient road sections. Criteria will take into account the current design standards and expected future traffic demands.

3.2. Phase II

(1) Design standard

Reasonable improvement design standards shall be determined applying or modifying the current standards of Bina Marga.

(2) Selection of roads for feasibility study

The deficient road sections identified in the Phase I shall be thoroughly selected for the feasibility study, considering their priority, social impact and physical conditions. The study roads shall be preferably selected so that they might become appropriate size for external financial aid.

(3) Improvement plans

Improvement plans for each section shall be formulated.

(4) Project cost estimate

Costs of improvement works shall be estimated in consideration of local conditions.

(5) Economic and financial evaluation

Improvement plans shall be evaluated for project feasibility taking into account the economic cost and benefit as well as technical aspects.

(6) Implementation program

For the most feasible projects, implementation program shall be proposed.

4. EXECUTION OF THE STUDY

4.1. Organization

The executing agency is the Directorate General of Highways (Bina Marga), the Ministry of Public Works of Indonesia.

4.2. Expertise and Man-Months

It is estimated that about 75 man-months of foreign expatriates will be required to support the executing agency for this study. The experts for this study are as follows:

(1) Project Manager
(2) Senior Transport Planner
(3) Traffic Engineer
(4) Economist
(5) Senior Highway Engineer
(6) Highway Engineer
(7) Structural Engineer
(8) Soil/Material Engineer
(9) Surveyor

4.3. Time Schedule

The study is to be completed within twelve (12) months after the commencement of the study.

F-2

FEASIBILITY STUDY ON ROAD DISASTER PREVENTION*

1. BACKGROUND

The Government of Indonesia has been emphasizing the development of road infrastructures to strengthen the country's economic structure in each of its four Repelitas.

During Repelita IV, the Directorate General of Highways (Bina Marga), the Ministry of Public Works of Indonesia determined to establish road networks throughout Indonesia and focused on implementation of rehabilitation and maintenance of existing road networks. The policy of road development has been to improve only the existing road networks to stable conditions due to financial constraints.

There is now a need for upgrading of formerly neglected bottleneck of road sections. In addition, elimination of dangerous slopes in cut and embankment will reduce the risk of road users and enhance the safety level. It has been pointed out that arterial road network in Sumatra is very important to exploit natural resources and to tap development potentials in the area.

In the "Study on the Integrated Regional Development Plan for the Northern Part of Sumatra (LTA-78)" by JICA in 1990, the road disaster prevention project for arterial road networks in Sumatra is proposed as one of high-priority projects during Repelita V, in connection with some of the "Integrated Development Programs (IDEP)" formulated in the study.

Under such circumstances, it is recommended to carry out the feasibility study on Road Disaster Prevention Project to confirm technical and economic feasibility of the project.

2. OBJECTIVES OF THE STUDY

2.1. Objectives

The objectives of this study are:

(1) To identify the sections with high incidence of the disasters on road slope or those with high possibilities along the project roads,

(2) To prepare a program of countermeasures along the selected sections,

(3) To develop techniques for road disaster prevention.

2.2. Project Roads

The project roads included in the study will be several national and provincial roads which pass through the critical parts of mountainous areas in Sumatra.

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3. SCOPE OF WORK

The study comprises the following two (2) phases:

Phase I : Identification of high disaster potential spots
Phase II: Project evaluation

3.1. Phase I

(1) Data collection and analysis

a) Traffic data
b) Socio-economic data
c) Road and transportation data
d) Engineering data (e.g. topographical, geological, hydrological, meteorological, etc.)
e) Records of road disasters
f) Records on the construction and the countermeasures for disaster of the project roads
g) Other data necessary for the study

(2) Field reconnaissance survey

Field reconnaissance survey shall be conducted to identify causes, types and scales of disasters among others.

(3) Identification and classification of high disaster potential spots

High disaster potential spots shall be identified then analyzed to trace the causes of disaster, in which disaster shall be classified in an appropriate manner.

(4) Identification of sections for feasibility study

Priority road sections for the feasibility study shall be identified relative to spots with high disaster potential and expected socio-economic impact.

3.2. Phase II

The following studies shall be carried out for the section identified for the feasibility study.

(1) Traffic study

a) Traffic survey
b) Analysis of traffic data and traffic demand forecast

(2) Engineering study

a) Topographical survey
b) Geological survey
c) Meteorological survey
d) Hydrological survey

(3) Preliminary design

a) Study of countermeasures
b) Preliminary design

(4) Project cost estimate

a) Construction cost
b) Maintenance cost

(5) Economic and financial evaluation

(6) Implementation program

(7) General review on disaster prevention measures

Measures to prevent road disaster shall be generally reviewed through the study including below:

a) High disaster potential spot identification technique
b) Classification of road disaster
c) Control works and construction method
d) Traffic control and information system

4. EXECUTION OF THE STUDY

4.1. Organization

The executing agency is the Directorate General of Highways (Bina Marga), the Ministry of Public Works of Indonesia.

4.2. Expertise and Man-Months

It is estimated that about 75 man-months of foreign expatriates will be required to support the executing agency for this study. The experts for this study are as follows:

(1) Project Manager
(2) Transport Planner
(3) Traffic Engineer
(4) Economist
(5) Landslide Engineer
(6) Senior Highway Engineer
(7) Highway Engineer
(8) Structural Engineer
(9) Soil/Material Engineer
(10) Surveyor

4.3. Time Schedule

The study is to be completed within twelve (12) months after the commencement of the study.

F-3

FEASIBILITY STUDY ON SUMATRA EAST COAST ROAD DEVELOPMENT*

1. BACKGROUND

The Government of Indonesia is determined to develop the eastern lowlands of Sumatra to exploit rich natural resources and potentials expected there, along with the transmigration policy and transportation development scheme there. This decision coincides with the policies set in the Repelita V.

The 2,600 km Trans-Sumatra Highway, which runs from Banda Aceh in the north to Bandar Lampung in the south, was completed in 1984 as the paved national road and has been contributing much to the promotion of regional development and the enhancement of the living standard of the people along the Highway. The Highway mainly passes through the mountain area on the west side of Sumatra. This route does not pass through some capitals, such as Pekanbaru, Jambi and Palembang, located on the eastern lowlands, and an arterial road network has not been provided in the vast eastern lowland area, where transmigration, agricultural and industrial developments are planned, though some parts of improvements of arterial road links have been completed or are on-going.

The Directorate General of Highways (Bina Marga), Ministry of Public Works of Indonesia has been endeavouring to establish road networks, but the previous plan appears to have been worked out without comprehensive and systematic approaches. Bina Marga now considers it necessary as a new policy for development of arterial road network in the area to carry out more in-depth investigation from the overall viewpoints.

In the "Study on the Integrated Regional Development Plan for the Northern Part of Sumatra (LTA-78)" by JICA in 1990, the Sumatra east coast road development project is proposed as one of the high-priority projects during Repelita V.

Under such circumstances, it is recommended to carry out the feasibility study on Sumatra East Coast Road Development Project to confirm technical and economic feasibility of the project.

2. OBJECTIVES OF THE STUDY

The objectives of the study are to examine the economic and technical feasibilities of the construction and grade-up of arterial road network to be connected among the provincial capitals along the east coast of Sumatra, namely Medan, Pekanbaru, Jambi, Palembang and Bandar Lampung, and to carry out route alternative study in consideration of the future traffic demand and future land use development plan.

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3. SCOPE OF WORK

The study will be conducted in two (2) phases, the road network formation study (Phase I) and the feasibility study (Phase II).

3.1. Phase I: Road Network Formation Study

In order to achieve the objectives mentioned above, the road network formation study shall include the following activities:

(1) Collection and review of all relevant existing data and development plans in the study area

(2) Supplementary investigations to clarify conditions of transportation in the study area

(3) Formulation of future development programs including land use plans in the study area

(4) Forecasting of future transportation demands in the study area

(5) Alternative study on road networks in the study area

(6) Traffic assignment and traffic analysis on each link

(7) Engineering study and preliminary cost estimate on road development schedule

(8) Establishment of strategy of road network formation

(9) Selection of priority road links

(10) Establishment of a system for periodic review of the road development program

3.2. Phase II: Feasibility Study

The feasibility study will be made for the high priority road links selected from the road network formation study, which will cover the following activities:

(1) Study of socio-economic framework including the land use and distribution of population

(2) Traffic investigation and traffic demand forecast

(3) Field survey for soil and materials investigations and analysis, hydrological survey and analysis, and topographic survey

(4) Determination of design policy, design criteria and standard

(5) Preliminary engineering designs

(6) Cost estimate including construction costs, right-of-way acquisition costs, maintenance costs, etc.

(7) Economic evaluation and socio-economic impact study

(8) Preparation of implementation program taking stage-wise construction into account

4. EXECUTION OF THE STUDY

4.1. Organization

The executing agency is the Directorate General of Highways (Bina Marga), the Ministry of Public Works of Indonesia.

4.2. Expertise and Man-Months

It is estimated that about 120 man-months of foreign expatriates (about 55 man-months for Phase I and about 65 man-months for Phase II) will be required to support the executing agency for this study. The experts for this study are as follows:

(1) Project Manager
(2) Senior Transport Planner
(3) Regional Planner
(4) Transport Economist
(5) Agricultural Economist
(6) Traffic Engineer
(7) System Analyst
(8) System Engineer
(9) Cost Estimator
(10) Senior Highway Engineer
(11) Highway Engineer
(12) Structural Engineer
(13) Soil/Material Engineer
(14) Surveyor

4.3. Time Schedule

The all study is to be completed within twenty-one (21) months after the commencement of the study, nine (9) months for Phase I and twelve (12) months for Phase II.

F-4

STUDY ON BRIDGE REPLACEMENT PROGRAM FOR SELECTED RURAL ROADS IN ACEH AND RIAU*

1. BACKGROUND

The Government of Indonesia currently aims to reinforce the physical foundation of the economy to support the sustained economic growth, economic efficiency and recovery and social justice. It seeks to establish and improve essential transport facilities in rural areas to increase activities in these areas for greater production and to induce direct development therein.

Some of the bridges in rural areas of Indonesia are old and temporary wooden bridges which are often closed to the traffic, especially during the rainy season. Missing or weak bridges diminish the usefulness of many existing roads. The situation has been regarded as one of the main constraints to the development of rural areas. The Government has selected some provinces in Indonesia, in which Aceh and Riau provinces are included.

The replacement of these old temporary and dilapidated bridges by permanent steel structures will ensure fast, safe and smooth land transportation, which will certainly contribute to socio-economic development in these areas.

Under such circumstances, it is recommended to carry out the Bridge Replacement Program for Selected Rural Roads in Aceh and Riau to providing the basic transport facilities in the rural areas.

2. THE PROJECT

The project involves the construction of new bridge structures to provide crossing facilities over rivers and streams along rural roads in the areas which are either at present unbridged or existing weak temporary structures.

In general, the design of the proposed bridge structures will be to utilize to the maximum extent possible steel components (H-beams, steel piles, etc.) on both the super-structure and sub-structure. The steel structures will be pre-fabricated to suit the requirements of the structures over river crossings ranging from 25 - 60 meters.

The criteria applied in selection of replacement bridges are as follows:

a) The internal rate of return (IRR) of the along road is below 15%,
b) Replacement/reconstruction of bridges are in urgent need,
c) Data necessary for the detailed design are almost completed except for geological information,
d) Steel girders can be easily transported from the designated parts to the bridge sites.

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About 100 bridge sub-projects have been initially identified with an aggregate length about 3,000 lineal meters in Aceh and Riau provinces.

3. OBJECTIVES OF THE PROJECT

The objectives of the project are to enhance regional development and facilitate the effective delivery of socio-economic extension services to the communities served, seek to support movement of non-oil product of the rural areas in Aceh and Riau provinces.

4. SCOPE OF WORK

(1) Site investigation

Site investigation is planned to inspect the existing condition of bridges proposed for replacement. Based on findings thorough site investigation, technical and economical assessment will be conducted to finally identify bridges to be replaced and to justify their viability from the view points of economics as well as socio-economic impacts.

(2) Detailed design

Technical investigation and surveys necessary for the design of bridges such as topographic survey, subsurface survey, hydraulic survey, etc., will be undertaken.

(3) Procurement

The steel materials for bridges may be procured by grant aid. These materials will be determined based on the detailed design.

(4) Construction

Bridges are planned to be constructed by either contract or administration with the utilization of labor-intensive methods to the maximum extent possible. Actual implementation will be supervised by the respective regional offices of Bina Marga with the technical assistance.

5. EXECUTION OF THE PROJECT

5.1. Organization

The executing agency is the Directorate General of Highways (Bina Marga), the Ministry of Public Works of Indonesia.

5.2. Expertise and Man-Months

It is estimated that about 200 man-months of consulting engineers will be required to support the executing agency for the implementation of the project. The consulting engineers shall be as follows:

(1) Project Manager
(2) Highway Engineer
(3) Bridge Engineer
(4) Design Engineer
(5) Structural Engineer
(6) Construction Engineer
(7) Mechanical Engineer

(8) Quantity Surveyor
(9) Cost Estimator
(10) Document Specialist
(11) Topographic Surveyor

5.3. Time Schedule

The project is to be completed within thirty (30) months after the commencement of the project.

F-32,47

FEASIBILITY STUDY ON REMOTE ISLANDS SEA TRANSPORTATION SERVICE*

1. BACKGROUND

1.1. Project Area

This project covers all the small islands in the Northern Part of Sumatra (the Region) including Sabang, Simeulue, Nias, Mentawai, Benkalis and other Riau islands.

1.2. Project's Role

Among other areas in Indonesia, the Region is well known for the large number of small islands existing there. For the inhabitants of those small islands, sea transportation has long been the sole means to support their lives and economic activities. The ships used for this transportation are traditionally called Nusantara Lokal, Perahu, etc., by their size and function.

According to the statistics in 1988, the numbers of calling ships in the Region are about 4,100, 13,000 and 14,500 for Nusantara, Lokal and Perahu respectively. These vessels have been playing principal roles in inter-island transportations including cargos and passengers and in the future no major changes are expected in them. However, there are several problems with this transportation system including i) handling inefficiency in terms of TONS/DWT; ii) weather-bound ship service; and iii) obsolete port facilities.

Besides the above traditional sea transportation services, ferry boat services have been in operation reflecting the increasing economic activities and the demand for automobiles on several islands. Currently two lines are in operation in the Northern Part of Sumatra: Malahayati (Aceh) - Balohan (P. Sabang) and Meulaboh (Aceh) - Sinabang (P. Simeulue). Statistics show an increasing demand for passengers, automobiles and cargos for these two ferry service lines. This tendency is expected to continue in the future. The demand for ferry services is not limited to these two islands, (ferry service between Sibolga and Gunung Sitoli is under consideration), but because of various reasons such as budget constraint, ferry boat service have not been available on other islands so far.

As described above, the sea transportation will continue to be essential for the inhabitants of the small islands, but there also exist several problems to be solved in future. Taking account of this situation, adequate countermeasures are required to establish efficient and safe inter-island sea transportation networks considering the roles of traditional transportation and the ferry services.

2. THE PROJECT

This project consists of two element projects, as follows:

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(1) the study on the sea transportation system including the formulation of a master plan for the inter-island transportation system and the formulation of an improvement/rehabilitation plan for the port facilities of small island ports

(2) the improvement/rehabilitation of old port facilities on small islands. A single small jetty for each port is sufficient.

3. OBJECTIVES OF THE STUDY

The objectives of this study are to formulate a master plan for an efficient and safe inter-island sea transportation network in the Region and also to establish an improvement/rehabilitation plan for the port facilities of the related small island ports.

4. SCOPE OF WORK

The following items shall be covered in this study:

(1) to collect and analyze basic data on natural conditions and socio-economic conditions.

(2) to evaluate the conditions of existing sea transportations between small islands focusing on the movement of passengers, cargos and vehicles, ship capacities, physical conditions of related facilities, natural conditions and the conditions of port operation and management.

(3) to forecast the future traffic volume for the ports including passengers, cargos, and vehicles.

(4) to identify the roles of Nusantara, Lokal, Rakyat, ferry boat etc. as means of sea transportation for all service lines.

(5) to formulate a master plan for an efficient and safe inter-island sea transportation network based upon the evaluations of items (1) to (4) above.

(6) to formulate an improvement plan for port facilities of related small islands ports.

(7) to make preliminary designs and rough cost estimations of related ports in item (6).

(8) to provide recommendations on the management and operations of sea transportation among small islands.

5. EXECUTION OF THE STUDY

5.1. Executing Agency

The Directorate General of Sea Communications (DGSC) of the Ministry of Communications is in charge of inter-island sea transportations in general. And the Directorate General of Land Communications (DGLC) of the Ministry of Communications is in charge of ferry boat services. Both of these organizations are concerned with this study.

5.2. Expertise and Man-Months

The expertises and total man-months required for the execution of this study are as follows:

Team leader
Port planner
Demand forecast expert
Shipping Expert
Port engineer
Oceanographic engineer
Port operation and management expert
Economic and financial analyses expert

The total man-months required will be about 40 m/m.

5.3. Time Schedule

The duration of the study will be 12 months.

5. Telecommunication

G-4

FEASIBILITY STUDY ON INTRODUCTION OF RURAL TELECOMMUNICATIONS*

1. BACKGROUND

1.1. Location

This project will cover the four provinces in the northern part of Sumatra: Aceh, North Sumatra, West Sumatra, and Riau. Specifically, the project will be implemented in the following Integrated Development Program s (IDEPs): West Aceh (P-2), West Coast Tapanuli (P-4), Nias Islands (P-5), South Sijunjung (P-7), Rokan Basin (P-9), Indragiri River (P-10) and Riau Islands (P-11).

1.2. Project's Role

The rural population of each IDEP area shown in Figure 1 enjoy fewer and less adequate telecommunication services than the urban population. Access to service and the penetration of service in rural areas are very low.

There are many kecamatans in the Region which do not have telephone services. For example, 88 kecamatans in Aceh and 122 kecamatans in North Sumatra are still without telephone lines. Furthermore, in the development areas, the average telephone penetration ratio is 0.17, a figure much lower than that of major cities (1.17). In view of social equity, this disparity should be rectified.

These areas are far from main exchanges, due to the presence of sea and mountains. There are some difficult areas which can not be covered by general telecommunication networks.

Under such circumstances, Integrated Development Programs are going to be executed to the aforementioned areas. In consideration of the development areas for the future, the installation of minimum telecommunication infrastructure is necessary. Therefore specific investment programs to extend and expand services at village centers and other remote centers are required.

Telecommunications media are essential for the smooth implementation of Integrated Development Programs and for the operation and maintenance of facilities after implementation.

With regard to the accomplishment of the Feasibility Study on the Introduction of Rural Telecommunication, the study should be based on the JICA Report concerning the guidelines for the feasibility study to be carried out for rural telecommunication network improvement and expansion in each rural area, issued in October 1985.

2. OBJECTIVES OF THE STUDY

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The objectives are to study the feasibility of the introduction of rural telecommunications.

3. SCOPE OF WORK

3.1. General

This work studies the rural telecommunication development plan and its feasibility in the development areas as shown in Figure 1 for twelve months. PERUMTEL is requested to implement a rural telecommunication project during Repelita V based on this feasibility study.

3.2. Major Items to Be Studied

"The Plan" will cover the following items:

(1) Background of the project

(2) Social and economic conditions

(3) Existing telecommunication facilities and services

(4) Present state of rural areas and telecommunication facilities and services

(5) demand and traffic forecast

(6) Kind of telecommunication services

(7) Rural telecommunication development plan

(8) Operation and maintenance

(9) Estimate of project cost

(10) Tariff and estimate of revenue

(11) Economic and financial analysis

(12) Implementation schedule and priority

4. EXECUTION OF THE STUDY

4.1. Executing Agency

The executing agency will be the Directorate General of Posts and Telecommunications, Ministry of Tourism, Post and Telecommunications.

4.2. Expertise and Man-Months

(1) Foreign Consultant

Team leader

Assistant team leader

Outside plant engineer

Network planning engineer

Traffic forecasting engineer

Radio engineer

Switching engineer

Construction engineer

Economist

(2) Requested Counterparts

Team leader

Switching engineer

Radio engineer

Outside plant engineer

Economist

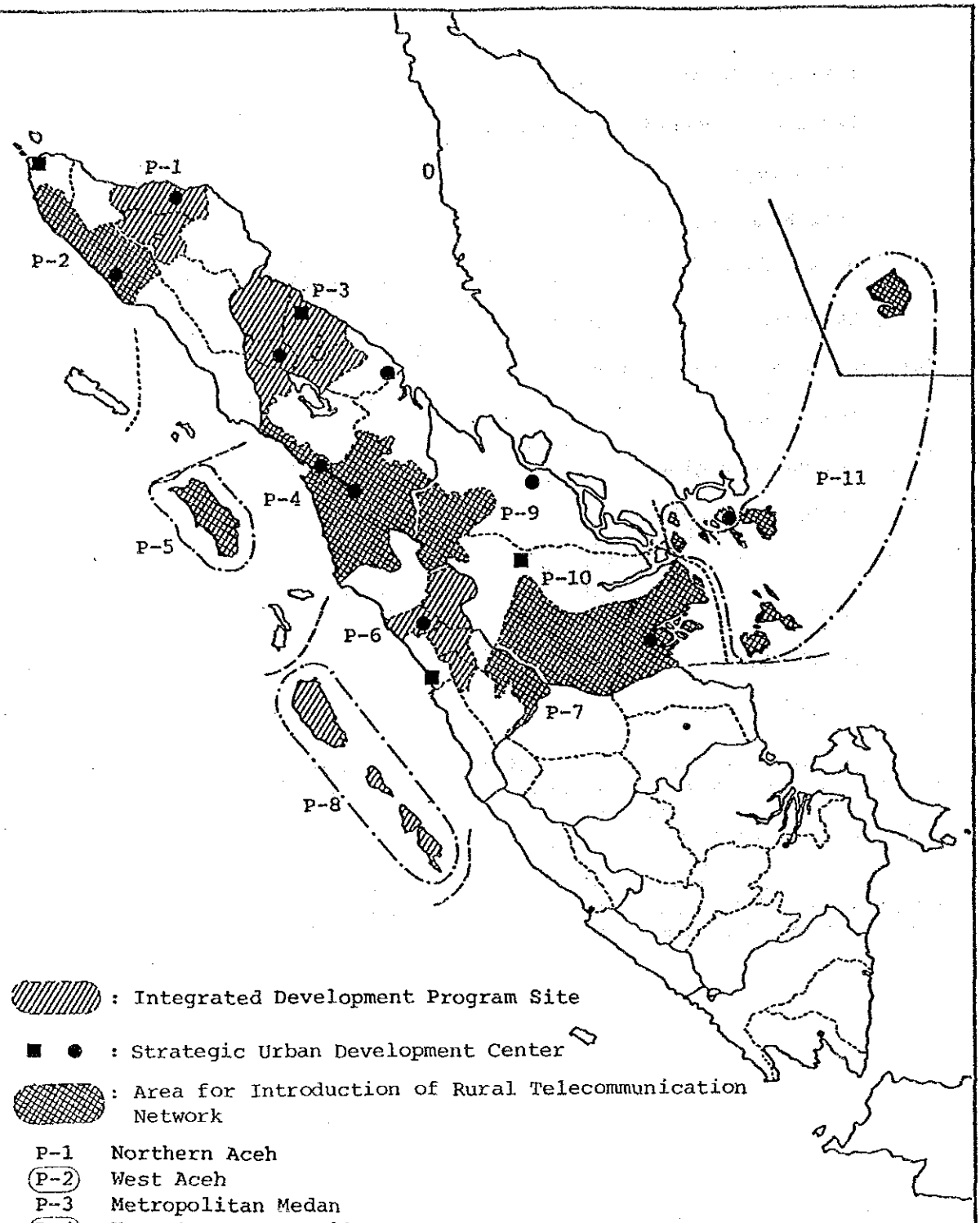
Technician

(3) Man-Month Estimate

The estimated total man-months are 94 m/m for foreign consultants and 50 m/m for local consultants.

4.3. Time Schedule

The study should be conducted by foreign consultants in cooperation with counterparts from POSTEL/PERUMTEL. The duration of the study will be 12 months.



P-1 Northern Aceh
P-2 West Aceh
P-3 Metropolitan Medan
P-4 West Coast Tapanuli
P-5 Nias Island
P-6 Minang Highlands
P-7 South Sijunjung
P-8 Mentawai Islands
P-9 Rokan Basin
P-10 Indragiri River
P-11 Riau Islands

Figure 1. Introduction of Rural Telecommunication Network Areas

G-25,35

CONSULTING SERVICES FOR TELEPHONE OUTSIDE PLANT MAINTENANCE CENTER*

1. BACKGROUND

1.1. Location

The project will be implemented in Medan, North Sumatra, and Padang, West Sumatra.

1.2. Project's Role

The northern part of Sumatra is divided into two areas according to administrative division by PERUMTEL. WITEL I consists of Aceh and North Sumatra Provinces which have their headquarters in Medan. WITEL II consists of West Sumatra and Riau Provinces, which are located in Padang. Both cities are situated at important points of the Telecommunication network. Moreover, these cities are the commercial and industrial centers of the region. There are still many applicants waiting for subscription to telephones in these big cities. In order to decrease the number of waiting applicants, the expansion of telecommunication network and telephone equipment has been carried out every year. Furthermore, the Integrated Regional Development Plan for Northern Sumatra is going to be started in the future. The need for telecommunication to transmit information is growing. The innovation of technique in telecommunications is progressing yearly. It is important to train staff to be more productive in order to cope with the increase of facilities and the latest equipment. As a result of the field study on the integrated regional development plan for Northern Sumatra, the following observation were made:

The condition of most of the existing equipment and supporting buildings for maintenance services is not adequate for full operation for expanded subscriber network facilities.

An investigation of the present maintenance service levels and field practices in the outside plant sector in PERUMTEL, reveals that:

- The maintenance technology and management system applied in the outside plant sector are considerably below the standards of those in the exchange and transmission maintenance sector of PERUMTEL.

- The present telephone fault rate appears to be around 9 faults/100 telephone-sets/month in average, which is still very high compared with many industrialized countries, where the average fault rate is around 4 to 5. (Japan=0.5)

- Outside plant faults represent by far the largest number of faults occurring in the telecommunication networks, accounting for around 95% of all reported faults.

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- The number of faults carried over for more than 6 days is considerably high. In most industrialized countries, 80 to 90% of the complaint faults are cleared within the end of the next working day (48 hours), and the percentage of faults carried over more than 6 days is virtually 0%.

- The average number of faults repaired by one lineman per day is 1.17 faults, which is a fairly low productivity. Usually one lineman should be able toclear 3 faults on average.

To achieve high-grade telecommunication network services, greater emphasis must be placed on improving the current maintenance practices and management controls, and on introducing new maintenance technology in the outside plant sector.

Accordingly, the Fifth Five-year plan emphasizes, as one of the most productive and effective measures for bringing about substantial improvement, that the majority of the existing outside plant maintenance division of telephone offices have to be improved into advanced Outside Plant Maintenance Centers (OPMCs).

The Outside Plant maintenance model center, which was constructed in Bandung in 1987, is well operated by the personnel of PERUMTEL and experts dispatched from Japan through the Japan International Cooperation Agency (JICA). Therefore, based on the success of OPMC in Bandung, and focusing on Northern Sumatra, PERUMTEL decided to establish telephone outside plant maintenance centers for the further improvement of maintenance conditions in Medan and Padang.

The sites and number of centers are as follows:

Medan	(1)
Padang	(1)

2. OBJECTIVES OF THE SERVICES

The objectives are to study the survey as well as , design and prepare tender documents for implementation of the OPMCs project.

3. SCOPE OF WORK

3.1. General

This work covers the Basic design, Detailed design and Tender documents of OPMC by consultants for twelve months. PERUMTEL is requested to implement the OPMC project during Repelita V based on this design.

3.2. Scope of Work

The scope of the consulting services for the Project will cover the following items in five (5) steps:

Step 1. Review of the operation of the OPMC in Bandung and field survey

(1) To review the operation of the OPMC in Bandung

(2) To assist PERUMTEL in deciding basic matters of the Project

(3) To confirm and investigate the project site

(4) To collect and analyze the data and information required for the basic and detailed designs

Step 2. Basic design and check/approval by PERUMTEL

(1) To conduct basic design

-Building
-Supporting facilities
-Communication system
-Measuring Equipment
-Tools

(2) To submit the basic design to PERUMTEL for check/approval in order to determine the scope of detailed design

Step 3. Detailed Design

To conduct detailed design including cost estimate and schedule of construction and installation.

Step 4. Preparation of Tender Documents

The Consultant shall assist PERUMTEL in preparing the necessary tender documents composed of the following, to meet the requirement for a formal and open international tender.

(1) Prequalification document
(2) Instruction to tenderers
(3) General terms of contract
(4) Special terms of contract
(5) Drawings
(6) Technical specifications
(7) Bill of Quantities

4. EXECUTION OF THE SERVICES

4.1. Executing Agency

The executing agency will be the Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications.

4.2. Expertise and Man-Months

Composition of the Fields Survey Team will be as follows:

(1) Foreign Consultant

Project manager
Chief architects
Architect
Building engineer
Outside plant engineers

(2) Requested Counterpart

Assistant project manager
Architects

Building engineers
Draftman

(3) Man-Month Estimate

The estimated total man-months are 50 m/m for foreign consultants and 54 m/m for local consultants.

4.3. Time Schedule

Consulting Services should be done by foreign consultants in cooperation with counterparts from POSTEL/PERUMTEL. The duration of the services will be 12 months.

G-28,37

STUDY ON LONG-TERM PLAN FOR LOCAL TELECOMMUNICATION NETWORK IN MULTI EXCHANGE AREA*

1. BACKGROUND

1.1. Location

The project covers two cities, Medan (North Sumatra) and Padang (West Sumatra).

1.2. Project's Role

The northern part of Sumatra is divided into two areas (WITEL I and WITEL II) according to the administrative division by PERUMTEL. WITEL I consists of Aceh and North Sumatra Provinces which have their headquarters is Medan. WITEL II consists of West Sumatra and Riau Provinces whose headquarters are located in Padang. Both big cities are situated at important points of the telecommunication network. Moreover, these cities are the commercial and industrial centers of the Region. The service quality and conditions for the telecommunications network in northern Sumatra have been gradually improved by past telecommunications development programs, i.e., Repelita I, II, III, IV and the on-going development program, Repelita V. But the fulfillment of the required telecommunication services has not improved much because of the unexpectedly rapid.increase in demand.

Up to now, the following long-term plans/master plans for Sumatra have been prepared by PERUMTEL.

City	Planning Period	Study Start	Assisted by	Final Report
Medan	1986 - 2005	1984	JICA	Nov. 1985
Whole Indonesia	- 2004	1986	JICA	Feb. 1987

Reflecting the rapid development and vitalization of economic and social activities throughout northern Sumatra, telecommunications demand in major cities is increasing and changing rapidly. So, in major cities, which usually coincide with multi-exchange areas in the telecommunication networks, it has become the most urgent matter to prepare a long-term plan (1989-2008) for each urban area.

The results of the JICA studies are still useful and valid in most part. However, some deviations and new service demand have been appearing for the last several years. It is therefore necessary to revise the study reports on Medan to cope with the present situation. In addition, a new plan for Padang is required. Particularly since

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local junction networks in Medan and Padang have not been studied well, this should be taken into account in the long-term plan.

A long-term plan generally covers a period of 10-20 years and must be reviewed from time to time. Yearly expansion plans must always be based on the latest long-term plan according to the stage of city development.

The following is important information to be derived from the long-term plan study:

-The location of the exchanges including new sites and new buildings

-The boundaries of the exchange areas

-The forecast number of subscribers within exchange areas

-The main cables and duct routes

-The junction network

-The scale of switching systems to be installed

-The application of new technology

-The cost estimates

In order to carry out the above long-term plan, the following main activities must be done:

-Investigations of the telecommunications network condition as well as environmental and socio-economical conditions in the project areas.

-The survey of detailed conditions on the telecommunications demand, i.e., for the telephone and for the non-voice in the project areas.

-The study of the future traffic conditions until 2008 and to plan the optimum junction network in the project areas.

-To develop subscribers cable network plan and to study the optimum condition on the concentration point of local cable network.

-To develop the medium-term telecommunication network development program and general comments on the implementation of the project.

-The follow-up of the smooth implementation for the development of future telecommunication networks in the project areas.

2. OBJECTIVES OF THE STUDY

The objectives are to study the long-term plan for local telecommunications network in multi-exchange area project.

3. SCOPE OF WORK

3.1. General

This work covers the long-term plan for the local telecommunications network in multi-exchange areas of Medan and Padang for twelve months.

3.2. Major Items to Be Studied

(1) General conditions, circumstances and the present situation of telecommunication facilities.

(2) Field survey with regard to telecommunications demand and cable networks.

(3) Data collection and discussion with staff from municipalities and POSTEL/PERUMTEL.

(4) Forecasts

(4-1) Municipality development forecast

(4-2) Telecommunications demand forecast

(4-3) Traffic forecast

(5) Preparation of Telecommunication Network Plan. Based on the aforementioned forecasts, the following will be carried out:

(5-1) Optimum local junction network plan

(5-2) Optimum local cable network plan

(5-3) Recommendable exchange plan

(5-4) Financial and Socio-economical analysis

(6) Preparation of Telecommunications Network Implementation Plan

(6-1) Basic Plan for telecommunication of installation work

(6-2) Implementation schedule

(6-3) Estimate of work and costs

4. EXECUTION OF THE STUDY

4.1. Executing Agency

The Executing agency of the study will be the Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications.

4.2. Expertise and Man-Months

The composition of the Field Survey Team will be:

(1) Foreign Consultant

-Team leader

-Assistant team leader

-Network planning engineer

-Traffic engineer

-Traffic and switching engineer

-Transmission engineer

-Outside plant engineer

-Economist

-Administrator

(2) Requested Counterparts

-Team leader

-Traffic and switching engineer

-Outside plant engineer

-Civil and building engineer

-Multiplex engineer

-Radio engineer

-Power engineer

-Economist

(3) Man-Month Estimate

Total man/month required will be 101 m/m (foreign consultant) and 99 m/m (national consultant).

4.3. Time Schedule

The study should be conducted by foreign consultants in cooperation with counterparts from POSTEL/PERUMTEL. The duration of the study will be 12 months.

6. Foresty/Environment

H-3

STUDY ON CONSERVATION AND MANAGEMENT OF PROTECTED WILDLIFE (ELEPHANT)*

1. BACKGROUND

1.1. Background of the Project

The northern part of Sumatra is endowed with rich and various wildlife and natural resources. The vegetation is primarily tropical rainforest dominated by species of the family Dipterocarpaceae. In addition, there are extensive tracts of swamp forest, peat swamp forest, deciduous forest, coastal forest, and mangroves. This rich natural resource base is a bulwark for ecological stability. Being ecologically fragile, these lands are vulnerable to development activities.

Land development has always been a cornerstone of economic development in Indonesia, and various kinds of development activities such as logging, mining, transmigration and establishment of monocultural plantations have destroyed vast areas of tropical rain forests.

The disruptive processes first became apparent in the northern part of Sumatra about the turn of the century, when agricultural settlements caused a substantial degree of deforestation. The conversion of primary forest into agricultural holdings has been one of the causes of conservation problems in the Region, and the elephant has been among the large mammals most seriously affected. The elephant by virtue of its enormous body size, mobility and intemperate appetite is unlikely to adapt to a man-dominated environment where agriculture is the principal mode of land use (Linsey 1986). Herein lies the key to the "elephant problem" in the Region.

The primary forest on Sumatra Island has been shrinking rapidly in extent over the recent decades, and most species of protected wildlife, especially the elephant (Elephas maximus sumatranus), have been seriously affected by the conversion of forest areas to agricultural land. Hence there is a need to take necessary steps to halt the trend and to ensure its long-term survival in the wild. More conscientious land use policies are needed to prevent further loss of primary forests and habitats of the protected wildlife and to establish conservation and management systems of the protected wildlife.

1.2. Project Area

(1) Location

The project area is the northern part of Sumatra which consists of 4 provinces, namely, Aceh, North Sumatra, West Sumatra and Riau .

(2) Description of the Project Area

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The land use activities in the northern part of Sumatra have almost squeezed the elephant out of North Sumatra Province. The elephant is one of the protected species of wildlife with requiring of large habitat. And there are only a few areas left even in Aceh and Riau provinces where elephants can be found. If firm, well planned and timely actions were not taken, the elephant would be under severe risk in the wild outside the protected areas. At present, several wildlife reserves have been designated in the Area. However, it is reported that some of their locations are quite inadequate. Unless much firmer conservation and management policies are adopted in remaining forest areas, the protected wildlife is likely to be squeezed out of the other provinces as well.

2. OBJECTIVES OF THE PROJECT

The objectives of the project are as follows:

- to establish conservation and management systems of the protected wildlife and their habitats;
- to reduce damage on agricultural crops by the protected wildlife and to mitigate complaints of the local people; and
- to establish a proper utilization plan for land and natural resources.

3. SCOPE OF WORK

The scope of work for the study shall cover the following items:

(1) Investigation of ecological conditions of the protected wildlife especially elephants and their habitats,

- to prepare a list of the protected wildlife in the area,
- to study existing conditions of habitat and its distribution,
- to study the annual home range of selected elephant population,
- to list up the protected wildlife which will be needed urgent conservation measures to be taken,

(2) Analysis and consideration of wildlife reserves and national parks for the protected fauna and flora,

- to review existing conservation measures which have been taken by the Government,
- to evaluate effectiveness and efficiency of them,
- to enumerate problems to be solved on wildlife conservation in Indonesia,
- to propose recommendable distribution and management system of wildlife reserves and national parks through the viewpoint of harmonization between wildlife conservation and land use activities of the local people,

(3) Estimation of damages to agricultural products by the protected animals,

- to study existing conflicts between the local people and protected wildlife,

- to estimate damages to agricultural products by the protected animals quantitatively,

(4) Consideration of mitigation measures which contribute to attain harmonious coexistence between the protected animals and the local people,

- to study possible countermeasures,

- to propose effective and practical countermeasures to be taken with several alternatives,

(5) Preparation and implementation of the wildlife conservation and management plan,

- to prepare the most effective conservation and management plan for protected wildlife

- to prepare a concrete action plan with necessary equipment,

- to estimate cost and schedule,

- to prepare its implementation plan,

4. EXECUTION OF THE STUDY

4.1. Executing Agency

The executing agency is the Directorate General of Forest Protection and Nature Conservation, the Ministry of Forestry. The consultant for the project shall fully cooperate with the Ministry of Population and Environment.

4.2. Expertise and Man-Months

(1) Expertise

Team leader (Biologist)

Ecologist (Fauna)

Forest planner

Land use planner

(2) Man-months

The project will require 26 man-months in total.

4.3. Time Schedule

The project is to be completed within eight (8) months after the commencement of the project.

7. Other

P-12

STUDY ON PRODUCTION AND MARKETING IN THE IDEP*

1. BACKGROUND

The Study on the Integrated Regional Development Plan for the Northern Part of Sumatra (Aceh, North Sumatra, West Sumatra and Riau) was conducted by a team of JICA (Japan International Cooperation Agency) for a period of 22 months ending in March 1990. In order to achieve the development goals most effectively and systematically, the JICA Team has proposed 11 Integrated Development Programs (IDEPs). They are: (i) Northern Aceh, (ii) West Aceh, (iii) Metropolitan Medan, (iv) West Coast Tapanuli, (v) Nias Island, (vi) Minang Highlands, (vii) South Sijunjung, (viii) Mentawai Islands, (ix) Rokan Basin, (x) Indragiri River, and (xi) Riau Islands. The Government of Indonesia has accepted the IDEP concept and decided to implement an appropriate part of the IDEPs during the Repelita V period (1989/90-1993/94) subject to confirmation of their feasibility and availability of funds. For details about the IDEPs see the Final Report of the JICA Study above.

2. NECESSITY OF THE PRODUCTION AND MARKETING STUDY

The rationale of the IDEP is that it can encompass a number of projects of various sectors under one program covering a sufficiently large area. The projects are so coordinated as to be mutually consistent and supportive. This close inter-project relation is particularly evident between the productive sector and the supportive/inducive infrastructural sector. For example, a port vitalization project is highly subject to the future levels of agricultural and industrial production in the hinterland. The same also applies to a road betterment project for which future traffic volume and routes are essential information. On the other hand, without good road system, agricultural production may not be induced to fully develop its potential. It is thus necessary that if there are a port project and a road project under the same IDEP, they should be based on the same projections of future production levels to be consistent with each other. For this purpose, projection must be on a commodity basis, specifying the levels in quantity terms. Production study of some commodity, however, cannot be adequate without examining the commodity's marketing possibility. Thus, production and marketing must be studied together to have more realistic and better framework for the IDEP projects.

3. OBJECTIVES OF THE STUDY

The objectives of the study are as follows:

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This Guideline only shows a general format, to be elaborated and modified when applied to a specific IDEP.

(i) To identify major agricultural and industrial commodities, both current and potential, and locate their production in the IDEP area under study;

(ii) To estimate the actual production volume of each of the major commodities identified above in some future year considering its maximum possible production level as well as the market for the commodity, both domestic and overseas; and

(iii) To identify possible bottlenecks with infrastructures, financing and institutions and make recommendations as to their elimination.

4. SCOPE OF WORK

4.1. Agriculture

The consultant shall:

(i) determine technically possible products (food and estate crops/livestock/fishery/forestry) in the IDEP area under study based on their development potentials and constraints and identify their production location;

(ii) select some major products which have comparative advantages and project their future, maximally possible production and their locations;

(iii) study international and domestic marketing possibilities of the selected commodities;

(iv) estimate the actual production of each commodity in the future considering the results from (ii) and (iii) above as well as government policies on employment, farmer's income, environment, women in development and so forth;

(v) identify necessary supporting services (agricultural inputs credit, extension and research) and propose incentive measures to encourage the farmers and prospective entrepreneur to take part;

(vi) identify those infrastructures which would be required to support the above production; and

(vii) make recommendations on the infrastructural, financial and institutional bottlenecks, if any, to be resolved for the realization of the projected production.

4.2. Industry

The consultant shall:

(i) identify small/medium-scale agro-industries and mineral processing industries which use locally-produced materials, is technically feasible and financially viable (e.g., oil seeds processing, starch, canning, rubber processing, palm oil mills, brick, ceramic);

(ii) identify home industries locally suitable, such as rattan, textile (ulos), furniture, souvenir goods, food processing

(shrimp cracker, tahu, tempe, etc.) and agricultural equipment (hoe, plow, etc.);

(iii) study international and domestic marketing possibilities of the identified products and examine their competitiveness especially with the same products from Java;

(iv) estimate the actual production of each product in the future considering the results from (iii) above;

(v) identify incentive measures to encourage the prospective entrepreneur to take opportunity;

(vi) identify those infrastructures which would be required to support the above production; and

(vii) make recommendations on the infrastructural, financial and institutional bottlenecks, if any, to be resolved for the realization of the identified enterprises.

5. EXECUTION OF THE STUDY

5.1. Executing Agency

The executing agency of this study will be the IDEP Unit to be established in BAPPEDA TK.I of the province concerned.

5.2. Expertise and Man-Months

The following expertise will be generally required to do the study (exact composition depends on the characteristics of the IDEP in question):

Regional planner/economist
Agricultural specialist
Industrial specialist
Marketing analysis specialist
Sociologist
Transportation planner
Water resources planner

In total 40-50 man-months (depending on the IDEP) will be required.

5.3. Time Schedule

The duration of the study will be about 9 - 12 months.

C. Outside IDEP Projects

B-39

FEASIBILITY STUDY ON WATER EXPORT FROM ACEH*

1. BACKGROUND

Needs for safe and sweet potable water have been rapidly increasing particularly in urbanized areas due to improvement of the living standard of people, scarcity of water source or insufficiency in piped water supply services. Now in Indonesia, it is not unusual that bottled water is sold not only in the urban area but also in the rural area.

It is reported by the newspaper (Indonesia Times, July 31, 1989) that some of European countries, the USA, the Mid-East Arabian countries, Singapore and Japan spent US$ 722 million to import mineral drinking water in 1987. This amount is expected to grow significantly in future.

Indonesia is generally endowed with water resources. In particular, Aceh in Sumatra is one of intensive rainfall areas and could present water of satisfactory level of quality for export, though subject to study. Taking into account the full use of the above marketing opportunity, comparative advantage in its geographical location (closest to the Arabian countries), production cost and source, water export from Aceh appears to have a brighten prospect.

Source of water for such purpose should be carefully and strictly found in springs, wells or streams, while usually the lowland might not be suitable because of turbidity and contamination and good source would be rather in the intermountainous rural zone.

For encouraging export-oriented and light industries and vitalizing the local economy, water export could become a break-through. In order to realize the water export project in Aceh, possibly coupled with such local water supply activities as the IKK projects, it is necessary to conduct the feasibility study at the earliest time.

2. OBJECTIVES OF THE STUDY

The objectives of the study is to conduct the feasibility study on water export from Aceh to be combined with local water supply system.

3. SCOPE OF WORK

The study should include the following items.

(1) Review the current status and issues of water bottling industries.

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(2) Study the water demands in Aceh and in the international market in terms of export volume and quality.

(3) Investigate alternative sources of water in Aceh, including quality analysis.

(4) Study the exploration, treatment, processing, storage and transportation methods of water.

(5) Study infrastructures required to produce and transport water (energy, road, harbour , etc.).

(6) Study the local water demand and the possible combined development mode for local water supply and industrial use for export.

(7) Estimate the cost required for the establishment of water export.

(8) Evaluate the feasibility of the water export project.

4. EXECUTION OF THE STUDY

4.1. Executing Agency

The executing agency for the study will be Ministry of Industry in full cooperation with Ministry of Public Works, Ministry of Health and Ministry of Mines and Energy. The coordination among the ministries, and other agencies will be made by BAPPENDA TKI, Aceh.

For executing the study, technical assistance is required in a form of a team of expertise under the official development assistance program.

4.2. Expertise and Man-Months

For executing the study, the following expertise will be required.

(1) Team leader (water supply planner)
(2) Hydrologist
(3) Hydrogeologist/Chemical analyst
(4) Geologist
(5) Water supply engineer
(6) Well engineer
(7) Water plant engineer
(8) Market research specialist / Economist

The total man-months required will be about 60 m/m.

4.3. Time Schedule

The duration of the study will be 12 months.

C-1

ESTABLISHMENT OF NON-METALLIC MINERAL RESOURCES RESEARCH CENTER*

1. BACKGROUND

The northern part of Sumatra, consisting of Aceh, North Sumatra, West Sumatra, Riau Provinces, covers about 264,000 km^2, inhabited by 18.6 million people. Many kinds of non-metallic mineral resources, namely dolomite, kaoline, feldspar, quartz sand, trass, bentonite, perlite etc., are distributed through the region as shown in Figure 1. However, little is done to determine their emplacement condition, quality and amount. Only limestone is being used for raw material of cement in two areas, as well as granite and marble resources for building materials. The Ministry of Mines and Energy has a regional office in each province, and these offices are in charge of local mining and energy affairs, jointly with the Provincial government. The Medan Regional Office, one of such regional offices, is constructing a new office which is supposed to be completed by the end of the 1989 fiscal year. As an annex to the office, a new laboratory is also established . Since many kinds of metallic minerals like gold, silver, tin, copper, zinc, lead, and rare metals are also distributed in the Region, the laboratory will be useful for research and development of these metallic mineral resources.

2. NECESSITY OF THE CENTER

Non-metallic mineral resources are very useful materials to develop local industries in the Region, together with metallic mineral resources and energy resources. A reason why these resources have not been fully developed so far is the lack of detailed survey to define their quality and quantity and to find their marketing possibility. Therefore, systematic reconnaissance survey should be carried out to identify and evaluate these resources, and promote their production and utilization.

In order to establish such a laboratory, some technical transfer is necessary for members of the Regional Office to conduct field surveys and treat samples in the laboratory. It is thus expected that the Medan laboratory will facilitate such activities. It also has a role of giving advice and consultation to firms or persons upon their request for general reconnaissance of mineral detection, chemical assay, field survey, etc.

3. OBJECTIVES OF THE CENTER

The Center will have the following objectives:

-to confirm locations of non-metallic resources in field on the basis of existing data and information.

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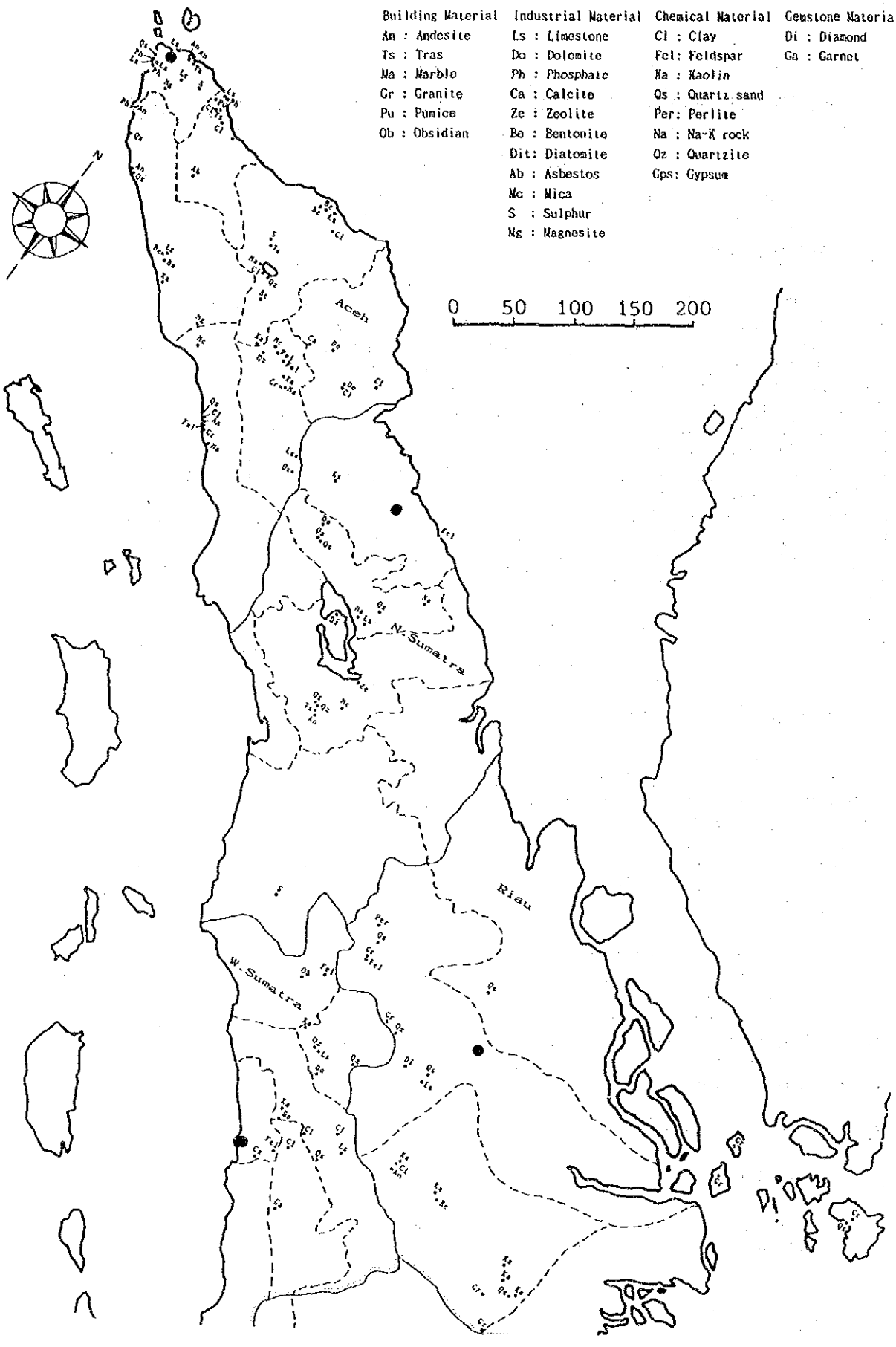

(source: Data of Directorate of Mineral Resources)

Figure 1. Distribution of Non-Metallic Minerals

-to carry out geological survey and sampling to unravel their potential.

-to assay and determine their grade and component through laboratory work.

-to test their property for utilization and search for their market.

It is urgently needed to strengthen the laboratory in Medan by installing necessary equipment for laboratory work and to attach experts for the purpose of advice and technical training on general reconnaissance survey.

4. INSTITUTIONAL ASPECT

The center will be operated for four provinces, Aceh, North Sumatra, West Sumatra and Riau. However, a field laboratory would be located at the North Sumatra Regional Office of the Ministry of Mines and Energy in Medan because the city is the center for the four provinces and a new office building is under construction with the plan to instal a laboratory. Counterpart personnel who are necessary to operate the Center will be provided from the four Regional Offices. The center will thus be collaborated among the four Regional Offices under coordination by the Medan Regional Office and the Directorate General of Geology and Mineral Resources, depending upon the scope and level of works.

5. SCOPE OF WORK FOR THE CENTER

(1) Review and study of the existing data

Existing data and information on non-metallic resources in the Region are computer filling as data bank.

(2) Execution of geological investigation

On the basis of the inventory, geological survey is carried out to estimate potential of the resources and collect sample for laboratory test.

(3) Laboratory work of samples collected from the field work

Samples collected from the field are analyzed in order to identify mineral components contained and detect their quality.

(4) Testing their property for a product on a warranted deposit

A good quality material obtained shall be ascertained its suitability for commodity product by necessary test.

(5) Evaluation of potentiality and quality of a resources

The results of the survey and the work in laboratory are generalized and evaluated. A good raw material shall be study its feasibility to use commercially.

(6) Market research

Market research shall be investigated on utilization of the exploitable non-metallic mineral resources.

(7) Transfer of technical knowledge

(i) Technical assistance through on-the-job training

(ii) Training operation of laboratory equipments, data treatment and report on assay result to counterpart

(iii) Training of overseas country for selected government staff to obtain wider technical knowledge of modern practices regarding the project

6. EXTERNAL AND INTERNAL INPUTS

6.1. External Input

The breakdown of the technical assistance required for the project is as follows:

(1) Equipment

Equipment requested for the project

(2) Technical advice

This will include experts of a exploration geologist, a mineralogist a ceramic engineer, a industrial mineral engineer and chemical engineer through the project.

(3) Overseas training

Counterpart staff will be invited for special training by overseas agency being in charge of the project.

6.2. Internal Input

The Government of Indonesia will provide the following items on its expense:

(1) Suitable office, spaces installing equipment for the laboratory

(2) Necessary members of counterpart

(3) Maintenance spare parts parts of laboratory equipments and consuming good, water, and electricity

(4) Reconnaissance survey expense of the experts and the counterparts

7. IMPLEMENTATION

The project will be implemented in two stages:

Stage 1: Reconnaissance Survey Phase

On the basis of the Plan of Operation described above, review and study of the existing data, execution of geological investigation, collection of samples for laboratory test, laboratory work of samples collected from the field work.

Stage 2: Evaluation Survey Phase

Necessary tests shall be done on good quality materials to ascertain suitability property for producing a commodity, and evaluation of potentiality and quality, marketing research of the resources to investigate feasibility for a production.

The second phase will be started for adaptable resources among investigated materials in the first phase survey. Taking the program into consideration, the project shall continue for five years.

F-12

FEASIBILITY STUDY ON MEDAN-BESITANG-LANGSA RAILWAY RECONSTRUCTION*

1. BACKGROUND

1.1. Project Area

This project covers the railway section between Medan and Langsa with particular emphasis on the section between Besitang and Langsa. The above section is part of the Aceh railway system which has been out of service in the recent years. The length of the proposed reconstruction section is about 79km.

1.2. Project's Role

The area surrounding the proposed railway section is one of the most industrially developed areas in Sumatra. There exist along the line many small- and medium-sized factories of timber processing, fertilizer and agro-processing. Besides, this area is one of the oldest plantation areas producing palm oil, rubber and many other plantation products.

Those plantation products used to be transported mainly by railway with a weak structure of 750mm width before motorization. Inefficient operation and poor management, however, caused the railway to lose its dominant position in the land transportation.

But the incentive role of the railway in regional development here should be reevaluated for the spherically continuous development of the area along the east coast of northern Sumatra, on which, especially in the areas located to the south of Medan, an aggressive modernization program for the railway system is about to launch. It is easily expected that the reconstructed railway, connected to the North Sumatra Railway system, whose full-scale innovation is also to be proposed, will form a transportation backbone of the Region. It is very possible that the reconstructed railway would contribute to the realization of efficient transportation in the Region.

2. THE PROJECT

The project aims at the vitalization of the transportation system along a corridor featuring the revival of the Aceh railway. The project consists of the following elements:

(1) Construction of a railway with 1067mm gauge which enables continuous railway service with the North Sumatra Railway centered around Medan and the port of Belawan.

(2) Establishment of an efficient railway operation and maintenance system which enables the railway sector to be competitive with the road transportation sector for the sake of industrial development of the surrounding areas.

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(3) As a future prospect, possibility of commuter service, corresponding to the expected spherical expansion of the Medan metropolitan area, is to be taken into account.

3. OBJECTIVE OF THE STUDY

The objective of this study is to examine the possibility of the reconstruction of the Aceh railway system based upon comparative study of functional attributes of different means of transportation, especially road transportation.

4. SCOPE OF WORK

Sub-studies to be covered in the study are as follows:

(1) To forecast future economic framework of the Region
(2) To forecast the demand for railway transportation
(3) To formulate a future train operation plan
(4) To conduct preliminary design for the reconstruction of road
(5) To estimate costs required
(6) To conduct economic/financial evaluation and socio-economic impact study

5. EXECUTION OF THE STUDY

5.1. Executing Agency

The Directorate General of Land Transportation (DJPD) of the Ministry of Communication and the Indonesian State Railway are responsible for the execution of the study and implementation of the work thereafter.

5.2. Expertise and Man-Months

The xpertise and total man-months required for the execution of this study are as follows:

1.Team leader/Railway planner
2.Transportation planner
3.Regional planner
4.Railway engineer
5.Train operation specialist/Management expert
6.Cost estimator
7.Structure engineer
8.Economist/Financial analyst

About 40 man-months will be required in total.

5.3. Time Schedule

The duration of the study will be 8 months.

H-7

STUDY ON WATERSHED MANAGEMENT TECHNOLOGY CENTER AND FORESTRY EDUCATION AND TRAINING CENTER*

1. BACKGROUND

1.1. Location

The center will be located at Aek Nauli, Sibatuloteng Forest Area, near Pematang Siantar, Kabpaten Simalungun, North Sumatra.

1.2. Project's Role

Owing to population pressure, deforestation and increased cultivation of annual crops on steep slops, Indonesia is increasingly facing problems of soil erosion, loss of productivity of agricultural land, siltation of river basins and dams, flooding, and consequent environmental and economic degradation. The Government of Indonesia with UNDP (United nations Development Programme) assistance has identified 81 watersheds of which 36 are considered priority areas, and of these 22 are considered to be in a highly critical condition. In these 22 area, the Northern Sumatra Region has 4 high priority watersheds, which are as follows:

Priority Order	Name of Watersheds	Province
10	Asahan Barumun	North Sumatra
17	Indragiri--Rokan	Riau
21	Wampu--Ular	North Sumatra
22	Krueng Aceh--Jambu	Aceh

In accordance with the National Policy Guidance (GBHN 1988), the Government has placed emphasis on watershed management and decided to establish six watershed management technology centers (WMTC) in different agricultural zones. The first one is currently being developed in Solo, Central Java. The proposed one will be the second WMTC to cover high rainfall-low population density ecological zone in Sumatra. Also, the Ministry of Forestry has established the master plan by planning to sep up a forestry complex at Pematang Siantar, North Sumatra, centralizing the Forest Research and Development Center (FRDC) and WMTC as well as the Forestry Education and Training Center (FETC) at one location. As for the forestry complex, FRDC Project was initiated in 1987 as the Forestry Institute and Conservation Project with assistance from the World Bank. WMTC and FETC have yet to be started, however, for financial reasons.

2. THE PROJECT

The outline of the master plan prepared by the Ministry of Forestry is as follows:

2.1. Land Site

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3,231 ha is prepared at the Sitatuloteng Forest Area with following description:

-Office, Laboratory, House, Dormitory	49 ha
-Forest for Education and Training	800 ha
-Forest for Research	2,382 ha

WMTC can utilize the above two forests for their activity.

2.2. Outline of the Forestry Complex

	Building	Area	Facilities	Numbers of staff
FRDC	73 units	7,472 m^2	Office, Lab. House	Max. 215 persons
WMTC	90 units	8,890 m^2	Office, Lab. House	Max. 141 persons
FETC	89 units	9,996 m^2	Office, Dormi. Mess.	Max. 95 persons
Total	252 units	26,358 m^2		Max. 451 persons

2.3. Contents of WMTC (Watershed Management Technology Center)

Staff	Number
Experts for experimental test	38
Assistant for Experts	64
Administrative Staff	39
Total	141

	Facilities and Infrastructure		Area (m^2)	Cost (Rp. 1,000)
1	Office		2,000	750,000
1	Laboratory for Soil, Hydrology, Geography and Workshop		1,200	450,000
1	Laboratory for Agronomy		600	225,000
1	Mess for Experts		150	56,250
2	Mess for Staff		140	52,500
1	House for Chief Officer		150	50,625
3	Houses for Assistant Officer		300	101,250
30	Houses for Experts		2,100	708,750
50	Houses for Staff		2,250	759,375
90	Buildings	Sub Total	8,890	3,153,750
	Road and Drainage			200,000
	Watersupply piping			100,000
	Electricty network			250,000
	Dike			400,000
	Landscaping			50,000
		Sub Total		4,153,750
	Equipments			1,000,000
	Site Opening cost			250,000
		Grand Total		5,403,750

2.4. Contents of FETC (Forestry Education and Training Center)

Staff	Number
Instructor	17
Assistant Instructor	15
Administrative Staff	63
Total	95

	Facilities and Infrastructure	Area(m2)	Cost (Rp. 1,000)
1	Office and Meeting Room	1,300	487,500
1	Lecture Room, Multipurpose Hall and Green House	1,000	375,000
1	Domitory	2,500	937,500
1	Dining Room and Kitchen	500	168,750
15	Houses for Instructors	1,050	354,375
1	Houses for Chief Officer	150	50,625
1	Houses for Assistant Officer	200	67,500
1	Mess for Instructors	150	56,250
2	Mess for Staff	140	52,500
14	Houses for Technician	756	255,150
50	Houses for Staff	2,250	759,375
89	Buildings Sub Total	9,996	3,564,525
	Road and Drainage		300,000
	Watersupply piping		200,000
	Electricity network		200,000
	Dike		400,000
	Landscaping		50,000
	Sub Total		4,714,525
	Equipments		1,750,000
	Site Opening cost		500,000
	Grand Total		6,964,525

2.5. Project Cost by Master Plan:

(Rp 1.000)

Item	WMTC	FETC	Total
Facilities & Infrastructure	4,153,750	4,714,525	8,868,275
Equipments	1,000,000	1,750,000	2,750,000
Site Opening Cost	250,000	500,000	750,000
Total	5,403,750	6,964,525	12,368,275

3. OBJECTIVES OF THE STUDY

The Forestry Complex as a single body, which is consisting of three bodies, that is, Forestry Research, Watershed Management Technology and Forestry Training Centers, is necessary to be built to enhance the performance of training, land rehabilitation and re/afforestation. The Complex can develop balanced technology with mutual coordination and, by utilizing facilities and human resources effectively, disseminate the results among forestry officials, non-officials and farmers. Objectives of this service is to prepare a construction plan and to estimate total costs incurred by the construction of WMTC and FETC upon the detail design atudy based on the existing master plan.

4. SCOPE OF WORK

4.1. General

Based upon the master plan, construction blueprints and cost estimates shall be prepared for WMTC and FETC to realize a harmonious and reasonable Forestry Complex after conducting detail design study.

4.2. Detail Design Study

- To draw complete blueprints of the Forestry Complex in accordance with the above mentioned contents of WMTC and FETC and to build miniature model of the Complex

- To make the specified construction plan for each building and to make respective blueprints with easily accessesible scale by constructors

- To calculate necessary volume and kinds of materials and commodities in accordance with each blueprint

- To estimate expected construction charges of each building

- To draw road route maps to meet each function of the buildings and to classify each road conditions including bridges with horizontal and vertical blueprints

- To estimate road construction expenses including bridge costs with practical calculations of molding and disposing soils

- To make blueprints for electricity, telephone or television lines and to estimate their installation costs

- To facilitate water-pipes, sewage disposals throughout the facilities with respective blueprint and to calculate installation charges

- To prepare dike and drainage facilities to meet heavy rainfall, and to estimate their costs with drawings

- To list up needed equipments for WMTC and FETC respectively and to calculate their amounts with estimated expenditures to maintain the total facilities and equipments

- To estimate site opening expenses for WMTC and FETC

5. EXECUTION OF THE STUDY

5.1. Executing Agency

The executing agency will be the Directorate General of Reforestation and Land Rehabilitation, the Center for Forestry Education and Training, Agency for Forestry Research and Development, Ministry of Forestry.

5.2. Expertise and Man-Months

The following expertise will be required to carry out the project:

Architect
Civil engineer
Surveying engineer

In total 56 man-months will be required.

5.3. Time Schedule

The duration of the project will be as follows:

Detail Design Study	12 months
Construction	2 years

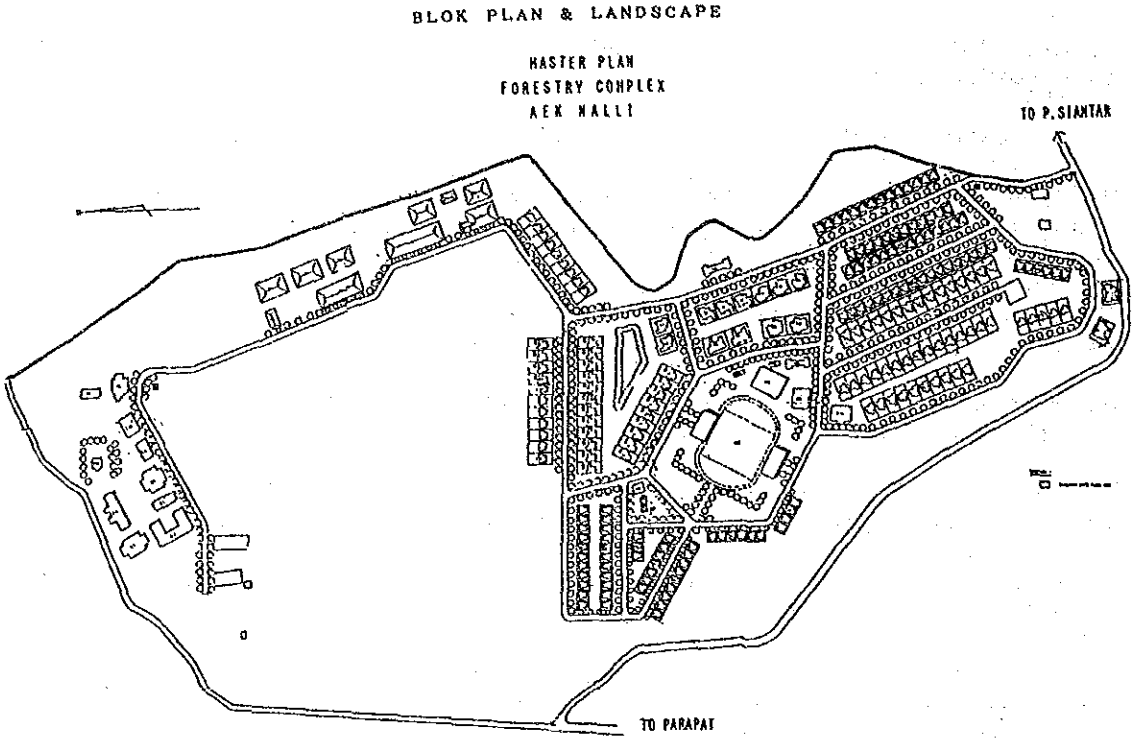

Figure 1. Blok Plan and Landscape

ESTABLISHMENT OF TOURISM MANAGEMENT TRAINING PROGRAM*

1. BACKGROUND

1.1. The Area

The program will primarily serve Sumatra. The program's base will be a center whose location is to be selected in a separate study.

1.2. Necessity of the Program

In the 1980s international tourism has increased substantially in Indonesia; the number of international tourist arrivals has more than doubled from 501,000 in 1979 to 1,286,000 in 1988. The targeted arrivals of 1,254,000 at the end of Repelita IV and the average annual growth of 14% were achieved successfully. Similarly, tourism revenue rose drastically to US$1,061 million in 1988 which indicated that the targeted revenue of US$1,080 million at the end of Repelita IV could likely be achieved, too. It is an eventual goal to place tourism in a place second or third to the oil and gas sector in the economy in terms of foreign exchange earnings.

Repelita V has set a target of 2.5 million foreign arrivals by 1994. General trends predicted a strong and continuing growth of international tourism in Southeast Asia and Indonesia. In addition, demand for domestic tourism is also expected to grow during Repelita V, perhaps by as much as 3% per annum. There are no complete data on domestic tourism yet. However, some indicators like domestic transport volume, visitor flow to tourist resorts, room occupancy rate and so forth indicate its continuing increase.

In order to support and respond to the expected development of the tourism sector, one of the key issues is to recruit and train necessary personnel. The Government of Indonesia has already established two tourism development and training schools (BPLPs), one in Bandung and the other in Bali. The two schools have provided the basis for the development of the various diploma courses offered. This has contributed to the establishment of the guidelines in the network of existing 25 private training centers in the country. Because of their locations the two national centers have responded primarily to the needs of two major tourism destination areas, namely Java and Bali. Sumatra, a growing area of tourism concentration, has not yet received the benefit of the major Government training institutions. Based on the recent trends of international tourist arrivals in the northern part of Sumatra, i.e., provinces of Aceh, North Sumatra, West Sumatra and Riau, it can be predicted that at least 4,500 rooms of the classified hotels will have to be provided by the end of Repelita V, 1993, and over 15,000 rooms by 2008 in the region. Therefore, it is quite crucial to the tourism development in Sumatra to respond to the growing needs to recruit and train the manpower and to improve the quality of services in the tourism sector.

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2. OBJECTIVES OF THE PROGRAM

The main goal of the program is to develop and promote the tourism industry by providing training programs for management staff in various occupations in the government sector as well as in the private sector primarily in Sumatra.

In order to develop an appropriate program, a study is necessary whose objectives are: (i) to identify and assess manpower needs and requirements on present circumstances and trend in the government offices and the tourism industry such as hotels, travel agencies, tourism consultants and so forth; (ii) to develop the training system and programs, both pre-service and in-service trainings; and (iii) to assist the Government to build and open a new training institute in Sumatra.

3. PLAN OF OPERATION OF THE PROGRAM

The training program will be organized taking local needs and conditions into account. A basis for the program is the standard curriculums currently used at the BPLPs which cover the following subjects:

(1) Diploma I
- Frond office
- Food service
- Food production
- Housekeeping

(2) Diploma II
- Accommodation
- Frond office
- Food service
- Food production
- Kitchen
- Pastry
- Tours and travel
- Tour leader
- Hotel accounting

(3) Diploma III
- Hotel management
- Food and beverage management
- Tourism planning and marketing

In order to formulate the program, a preparatory study is needed whose scope of work is as follows:

(1) Identification and Assessment of Manpower Needs in Sumatra

In particular relation to Sumatra, the study will assess the existing backlog of hotel and tourism personnel in need of training and provide the basic parameters for determining future manpower requirements, using data on manpower characteristics currently available or being researched. In this step the study can utilize the experiences of the existing BPLPs in Bandung and Bali and their impact on the human resource needs of the sector.

The study will establish projections for hotel and tourism staff in Sumatra for the next decade. The projections will be based on the expected development of tourism, the list of proposed new projects, the likely changes in the geographical distribution of hotels, patterns of recruitment and employment, projected rates of drop-outs and replacement, and so forth.

Based on the projections the study will identify the training needs to be met by the new center, and relate them to a particular structure and program of courses.

(2) Development of Training System and Programs

The study will propose the range of the full-time diploma courses to be offered and the standard curriculum to be used, based on the experiences of both BPLP Bandung and Bali as well as the relevant criteria of the Ministry of Education. The study will also define the role of the program in relation to part-time and upgrading courses, and will describe the proposed program to be offered during a typical year of operation. It will specify the corresponding numbers trained over the initial five years of the program.

(3) Basic Design of the Training School

The study will evaluate the proposed location and site for the school in Sumatra. It will also recommend a solution for the best use of the site. The solution will orient the construction and development of the first phase of the project and indicate the additional use of the site for the further phases. The study should, in accordance with the recommended training activities, the number and throughput of students, list the complete range of facilities to be provided in the first phase together with the corresponding allocations of space.

The study should produce sketch plans of the conceptual design of the first phase and indicate the outline of construction specifications. The needs for physical infrastructure will also be examined, and the manner and cost of its provision identified. Furthermore, a full list of equipment for the proposed study, with specifications, should also be prepared.

(4) Estimation of Program Costs

Based on the basic design a detailed estimate of capital costs should be prepared. The study should also include an estimate of the operating costs of the school and, in addition to that, identify sources for funding the recurrent expenditure with a corresponding budget allocation.

(5) Organizational Framework

The study should also include an organizational proposal for the program with not only outlines of roles and responsibilities of key staff but also outlines of administrative structure. In connection with the above the staffing plan should be prepared with proposals as to the recruitment of the necessary teaching staff. The needs for any international teaching staff should also be included with proposed sources for this kind of technical cooperation. The outline of an overall proposal for technical cooperation should be discussed and may include not only international expertise but also equipments, a fellowship program and other inputs, if any.

4. EXECUTION OF THE PROGRAM

4.1. Executing Agency

The executing agency of the program will be the Directorate General of Tourism, Ministry of Tourism, Post and Telecommunication.

4.2. Expertise and Man-Months

The program will be carried out by a team of hotel and tourism training specialists (about 10) together with some administrative staff.

The study will be undertaken by a consulting team of hotel and tourism training specialists, and hotel and tourism school planners (architects) with total 33 man-months.

4.3. Time Schedule for the Study

The study will require a total period of 12 months to be completed.

D. Guideline for Study Index