

Code Number: F-31

1. Project Title : BELAWAN PORT EXPANSION II
2. Location : North Sumatra (Belawan)
3. Executing Agency : Directorate General of Sea Communication,  
Ministry of Transport & Indonesia Port  
Authority I
4. Objectives : - Overall Industrial Development in North  
Sumatra  
- For Container transportation
5. Project Description : - Dredging and reclamation, quay  
construction  
- Road construction (3.5 km)  
- Paving of road and services  
- Port sheds and buildings  
- Procurement of tug boats, pilots boats  
- Procurement of cargo handling equipment  
(for container)
6. Project Duration : 36 months
7. Project Cost : US\$ 117,560,000,
8. Related to Project Aid: - North Sumatra Railway System Improvement  
- Aceh Railway Construction  
- Binjai - Medan Toll Road
9. Stage of Project  
Preparation : F/S and E/S of Phase II was completed on  
Dec. 1983

Code Number: F-32

1. Project Title : REMOTE ISLAND SEA TRANSPORTATION SERVICE (NIAS)
2. Location : Nias Island, North Sumatra
3. Executing Agency : Directorate General of Sea Communication, Ministry of Transport & Indonesia Port Authority I
4. Objectives :
  - Promotion of Nias Island Integrated Development Program
  - Introduction of car ferry service for tourism development
5. Project Description :
  - Feasibility study on improvement of port in Nias Island
  - Implementation of new construction of 80 m berth
6. Project Duration : Feasibility Study: 12 months  
Implementation : 24 months
7. Project Cost : US\$ 2,000,000 \*
8. Related to Project Aid: Nias ring road, airport development projects
9. Stage of Project Preparation :
  - Project idea
  - In junction with Nias Island Integrated Development Program

\* Cost tentative to be based on F/S

Code Number: F-33

1. Project Title : SIBOLGA PORT EXPANSION
2. Location : Sibolga, North Sumatra
3. Executing Agency : Directorate General of Sea Communication,  
Ministry of Transport & Indonesia Port  
Authority I
4. Objectives : - Promotion of Nias Island and West Coast  
Tapanuli Integrated Development Programs
5. Project Description : - Feasibility study on the expansion of  
port facilities (berth, warehouse and  
yard)
6. Project Duration : Feasibility Study: 12 months  
Implementation : 24 months
7. Project Cost : US\$ 5,000,000 \*
8. Related to Project Aid: - Arterial road upgrading, west coast  
Tapanuli road network development and  
remote island sea transportation  
services.
9. Stage of Project  
Preparation : - Project idea  
- In junction with Nias Island and West  
Coast Tapanuli Integrated Development  
Programs

\* Cost tentative to be based on F/S

Code Number: F-37

1. Project Title : NIAS ISLAND AIRPORT IMPROVEMENT
2. Location : Nias Island, North Sumatra
3. Executing Agency : Directorate General of Air Communication,  
Ministry of Transport
4. Objectives : - Promotion of tourism
5. Project Description : - Extension of runway for F-27
6. Project Duration : Feasibility Study: 15 months  
Implementation : 24 months
7. Project Cost : US\$ 3,500,000 \*
8. Related to Project Aid: None
9. Stage of Project Preparation : F/S, E/S needed

\* Cost tentative to be based on F/S

Code Number: F-38

1. Project Title : MEDAN AIRPORT EXPANSION
2. Location : Medan, North Sumatra
3. Executing Agency : Directorate General of Air Communication,  
Ministry of Transport
4. Objectives : - For the safety of aircraft landing and  
take-off  
- Promotion of tourism industry
5. Project Description : - Extension of runway (4000 m)  
- Modernization of safety facilities (ILS,  
etc.)  
- Environmental protection  
- In relation to urban planning in the city  
of Medan  
- Study for relocation may be needed
6. Project Duration : 36 months
7. Project Cost : US\$ 84,000,000
8. Related to Project Aid: - Tourism promotion project around Lake  
Toba and Brastagi  
- Road improvement project (Brastagi Road,  
Toba ring road)
9. Stage of Project  
Preparation : E/S completed

Code Number: F-39

1. Project Title : BUKITTINGGI - PEKANBARU ROAD BETTERMENT
2. Location : Bukittinggi - Pekanbaru, West Sumatra and Riau
3. Executing Agency : Directorate General of Highways, Ministry of Public Works
4. Objectives : - To improve the road network between Bukittinggi in West Sumatra and Pekanbaru in Riau to promote regional industry and to promote balanced socio-economic development in the region
5. Project Description : The project comprises of:
  - Implementation of upgrading existing highway (217 km), and
  - Consulting services for detailed design and supervision works.
6. Project Duration : 30 months
7. Project Cost : US\$ 24,000,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: F-45

1. Project Title : SAWAHLUNTO - PADANG - TELUKBAYUR RAILWAY IMPROVEMENT
2. Location : Padang Pariaman, Tanah Datar and Sawahlunto, West Sumatra
3. Executing Agency : Directorate General of Land Transport, Ministry of Transport & Indonesian State Railways
4. Objectives : - Enhancement of coal production level at Sawahlunto coal mining
5. Project Description : - Improvement of rack-truck and rehabilitation of existing track
6. Project Duration : 36 months
7. Project Cost : US\$ 50,000,000 \*
8. Related to Project Aid: None
9. Stage of Project Preparation : - F/S and E/S were conducted by French consultant (Dec. 1986) and Japanese consultant (Oct. 1987)  
- The above study should be reviewed

\* Cost tentative to be based on review study

Code Number: F-47

1. Project Title : REMOTE ISLAND SEA TRANSPORTATION SERVICE  
AROUND MENTAWAI ISLANDS
2. Location : Padang and Mentawai Islands, West Sumatra
3. Executing Agency : Directorate General of Sea Communication,  
Ministry of Transport & Indonesia Port  
Authority II
4. Objectives : - Remote islands sea transportation service  
- Incentive role for regional development
5. Project Description : - Construction of ports of small scale for  
each of the islands (Siberut, Sipora and  
Pagai)  
- Integration with the mainland
6. Project Duration : Feasibility Study: 10 months  
Implementation : 24 months
7. Project Cost : US\$ 2,000,000 \*
8. Related to Project Aid: None
9. Stage of Project  
Preparation : Project idea

\* Cost tentative to be based on F/S



Code Number: F-49

1. Project Title : TELUKBAYUR PORT EXPANSION
2. Location : Padang, West Sumatra
3. Executing Agency : Directorate General of Sea Communication,  
Ministry of Transport & Indonesia Port  
Authority II
4. Objectives : - Containerization  
- Remote island sea transportation service
5. Project Description : - Construction of container terminal  
- Rehabilitation of port facilities  
- Transfer of passenger service from the  
port of Muara Padang
6. Project Duration : Feasibility Study: 15 months  
Implementation : 36 months
7. Project Cost : US\$ 5,000,000 \*
8. Related to Project Aid: - Sawahlunto - Padang - Telekbayur railway  
improvement  
- Remote island sea transportation service  
around Mentawai Islands
9. Stage of Project  
Preparation : Project idea

\* Cost tentative to be based on F/S

Code Number: F-50

1. Project Title : PADANG AIRPORT IMPROVEMENT
2. Location : Padang, West Sumatra
3. Executing Agency : Directorate General of Air Communication,  
Ministry of Transport
4. Objectives : - For the safety of aircraft landing and  
take-off
5. Project Description : - Extension of runway  
- Renovation of terminal and related facilities
6. Project Duration : 36 months
7. Project Cost : US\$ 70,000,000 \*
8. Related to Project Aid: None
9. Stage of Project Preparation : Existing relocation project should be reviewed

\* Cost tentative, assuming almost same extension work would be conducted instead of relocation

Code Number: E-55

1. Project Title : DUMAI PORT EXPANSION
2. Location : Dumai, Riau
3. Executing Agency : Directorate General of Sea Communication,  
Ministry of Transport & Indonesia Port  
Authority I
4. Objectives : - Transportation of palm oil and industrial  
products
5. Project Description : - Berth for miscellaneous cargoes (10 m  
deep, 400 m long)  
- Berth for multi-purpose use (6 m deep,  
250 m long)  
- Palm oil berth (10 m deep)
6. Project Duration : 36 months
7. Project Cost : US\$ 87,000,000
8. Related to Project Aid: Batam industrial development
9. Stage of Project Preparation : M/P was completed on Oct. 1983 by JICA but  
there was a scale-down of the plan relative  
to Batam development

Code Number: F-56

1. Project Title : PEKANBARU PORT IMPROVEMENT
2. Location : Pekanbaru, Riau
3. Executing Agency : Directorate General of Sea Communication &  
Directorate General of Land Transport and  
Inland Waterways, Ministry of Transport
4. Objectives : - Industrial development utilizing river
5. Project Description : - Project under DGSC  
- Construction of berth (80 m)  
- Dredging
6. Project Duration : 18 months
7. Project Cost : US\$ 1,500,000
8. Related to Project Aid: None
9. Stage of Project Preparation : - M/P and F/S were completed on Sept. 1987  
- The study result was feasible  
- E/S not started

Code Number: F-57

1. Project Title : INTEGRATED TRANSPORT SYSTEM DEVELOPMENT
2. Location : Indragiri Hulu and Indragiri Hilir, Riau
3. Executing Agency : Directorate General of Sea Communication & Directorate General of Land Transport and Inland Waterways, Ministry of Transport
4. Objectives :
  - Promotion of plantation development
  - Transportation of agricultural products (rice, etc.)
  - Transportation of palm oil to Batam
5. Project Description :
  - River dredging of Indragiri river
  - Development of small- and medium-sized ports (Kuala Enok, Cinako, Kualaguang, Tembilihan)
6. Project Duration : 18 months
7. Project Cost : US\$ 10,000,000 \*
8. Related to Project Aid: None
9. Stage of Project Preparation : Project idea. Needs urgent masterplan formulation

\* Cost tentative to be based on F/S, assuming three 80 m berths at three ports (\$ 810,000) and dredging cost of Indragiri river up to 1994 (\$ 120,000)

Code Number: E-58

1. Project Title : RIAU ISLANDS SEA TRANSPORTATION SERVICE
2. Location : Riau
3. Executing Agency : Directorate General of Sea Communication,  
Ministry of Transport
4. Objectives : - Remote island sea transportation service  
(Singkep, Karimun, etc.)  
- Promotion of local industries  
- Include ferry services
5. Project Description : - Berth extension & improvement of port  
facilities
6. Project Duration : 24 months
7. Project Cost : US\$ 2,000,000 \*
8. Related to Project Aid: None
9. Stage of Project  
Preparation : Project idea, M/P needed

\* Cost tentative to be based on F/S, assuming three ferry ports (80 m)  
for at least three islands, and improvement facility

Code Number: F-59

1. Project Title : BENGKALIS - MAINLAND FERRY CONNECTION
2. Location : Bengkalis, Riau
3. Executing Agency : Directorate General of Sea Communication, & Directorate General of Land Transport and Inland Waterways, Ministry of Transport
4. Objectives : - Integration of off-shore islands with the mainland and resultant enhancement of industrial activities
5. Project Description : - Construction of ferry berth and related facilities
6. Project Duration : 18 months
7. Project Cost : US\$ 1,000,000 \*
8. Related to Project Aid: None
9. Stage of Project Preparation : Project idea, M/P needed

\* Cost tentative, assuming ferry ports construction (80 m) and related facilities on the side of Bengkalis

Code Number: F-60

1. Project Title : BATAM - BINTAN FERRY CONNECTION
2. Location : Batam and Bintan Islands, Riau
3. Executing Agency : Directorate General of Land Transport and  
Inland Waterways, Ministry of Transport
4. Objectives : - Expansion of Batam influenced area
5. Project Description : - The berth already under construction at  
Tanjunguban (Bintan island), the berth at  
Kabil has begun to be constructed (1989)  
- Ro-Ro system to facilitate tourism  
especially from Singapore and Malaysia
6. Project Duration : 18 months
7. Project Cost : US\$ 1,000,000 \*
8. Related to Project Aid: None
9. Stage of Project  
Preparation : Implementation

\* Cost tentative, assuming ferry port construction (80 m) and related facility on the side of Bintan



Code Number: F-63

1. Project Title : RENGAT AIRPORT IMPROVEMENT
2. Location : Indragiri Hulu, Riau
3. Executing Agency : Directorate General of Air Communication,  
Ministry of Transport
4. Objectives : - Remote area passenger service
5. Project Description : - Construction of terminal building
6. Project Duration : 18 months
7. Project Cost : US\$ 3,500,000 \*
8. Related to Project Aid: None
9. Stage of Project  
Preparation : Project idea

\* Cost tentative to be based on F/S

Code Number: F-64

1. Project Title : TANJUNG PINANG AIRPORT IMPROVEMENT
2. Location : Bintan Island, Riau
3. Executing Agency : Directorate General of Air Communication,  
Ministry of Transport
4. Objectives : - Remote Island Service
5. Project Description : - Extension of runway for the accommodation  
of larger aircraft (F-28)
6. Project Duration : 24 months
7. Project Cost : US\$ 14,000,000 \*
8. Related to Project Aid: None
9. Stage of Project  
Preparation : Project idea, M/P & F/S needed

\* Cost tentative to be based on F/S

Code Number: F-65

1. Project Title : SINGKEP AIRPORT IMPROVEMENT
2. Location : Singkep Island, Riau
3. Executing Agency : Directorate General of Air Communication,  
Ministry of Transport
4. Objectives : - Remote island service
5. Project Description : - Extension of runway for the accommodation  
of larger aircraft (F-27)
6. Project Duration : 18 months
7. Project Cost : US\$ 7,000,000.\*
8. Related to Project Aid: None
9. Stage of Project  
Preparation : Project idea, M/P & F/S needed

\* Cost tentative to be based on F/S

Code Number: F-66

1. Project Title : PEKANBARU AIRPORT IMPROVEMENT
2. Location : Pekanbaru, Riau
3. Executing Agency : Directorate General of Air Communication,  
Ministry of Transport
4. Objectives : - Passenger service  
- Safety of aircraft
5. Project Description : - Extension of runway for the accommodation  
of larger aircraft (DC 9)
6. Project Duration : 18 months
7. Project Cost : US\$ 7,000,000 \*
8. Related to Project Aid: None
9. Stage of Project  
Preparation : Project idea, M/P & F/S needed

\* Cost tentative to be based on F/S

Code Number: G-4

1. Project Title : INTRODUCTION OF RURAL TELECOMMUNICATIONS
2. Location : Aceh, North Sumatra, West Sumatra and Riau
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives :
  - To fulfill and support the following requirements for the telephone and non-telephone services:
    - (a) To improve accessibility to telephone service
    - (b) To promote regional economic activities
    - (c) To ensure social equity
5. Project Description :
  - Feasibility study of introduction of rural telecommunication
  - Basic/detailed engineering design
  - Procurement of transmission system, power plant, building and land
  - Construction of rural telecommunication network
6. Project Duration : Feasibility study: 12 months  
Implementation : 48 months
7. Project Cost : Feasibility study: US\$ 1,700,000  
Implementation : US\$ 57,000,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: G-5

1. Project Title : SUMATRA KOTAMADYA LOCAL TELEPHONE NETWORK EXPANSION (I)
2. Location : Banda Aceh, Aceh
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Post and Telecommunications
4. Objectives : - To fulfill and support the following requirements for the telephone and non-telephone services:
  - (a) To accommodate the existing waiting applicants
  - (b) To reduce waiting period for new subscription
  - (c) To improve service grade
  - (d) To promote regional economic activities
  - (e) To modernize telecommunication facilities
5. Project Description : - Provision of telephone service facilities in accordance with demand including the following:
  - (a) Digital switching system (for local and toll switching systems)
  - (b) Local cable network
  - (c) Transmission system
  - (d) Power plant
  - (e) Building and land
6. Project Duration : 240 months
7. Project Cost : US\$ 57,000,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: G-12

1. Project Title : COIN TELEPHONE SETS PROVISION
2. Location : Banda Aceh and other kotamadyas and kabupatens, which have automatic switching centers
3. Executing Agency : - Directorate General of Post and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To fulfill and support the following requirements for the telephone and non-telephone service:
  - (a) To improve accessibility to telephone service
  - (b) To promote regional economic activities
5. Project Description : Provision of coin telephone sets in accordance with the needs
6. Project Duration : 240 months
7. Project Cost : US\$ 600,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: G-15

1. Project Title : SUMATRA KOTAMADYA LOCAL TELEPHONE NETWORK EXPANSION (I)
2. Location : Medan, Binjai, Tebin Tinggi, Pematangsiantar, Sibolga
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To fulfill and support the following requirements for the telephone and non-telephone services:
  - (a) To accommodate the existing waiting applicants
  - (b) To reduce waiting period for new subscription
  - (c) To improve service grade
  - (d) To promote regional economic activities
  - (e) To modernize telecommunication facilities
5. Project Description : - Provision of telephone service facilities in accordance with demand including the following:
  - (1) Digital switching system (for local and toll switching system)
  - (2) Local cable network
  - (3) Transmission system
  - (4) Power Plant
  - (5) Building and land
6. Project Duration : 240 months
7. Project Cost : US\$ 480,000,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Partly on-going as of January 1990



Code Number: G-21

1. Project Title : PACKET DATA COMMUNICATION SYSTEM (SKDP) EXPANSION
2. Location : Medan, North Sumatra
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives :
  - To improve and extend Data Communication Network to enable to serve the demand of data communication which is growing rapidly
  - To promote regional economic activities
5. Project Description : - The project is composed of:
  - (a) Detailed engineering design
  - (b) Procurement of packet switching equipment, data transmission facilities and accessories
  - (c) Delivery, insurance, installations
  - (d) Testing and commissioning
  - (e) Maintenance support
  - (f) Training
6. Project Duration : 240 months
7. Project Cost : US\$ 12,000,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: G-23

1. Project Title : COIN TELEPHONE SETS PROVISION
2. Location : Medan and other kotamadyas and kabupatens which have automatic switching centers
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To fulfill and support the following requirements for the telephone and non-telephone services:
  - (a) To improve accessibility to telephone service
  - (b) To promote regional economic activities
5. Project Description : - Provision of coin telephone sets in accordance with the needs
6. Project Duration : 240 months
7. Project Cost : US\$ 4,320,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: G-25

1. Project Title : TELEPHONE OUTSIDE PLANT MAINTENANCE CENTER (OPMC)
2. Location : Medan, North Sumatra
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - The OPMC is required to fulfill the following functions:
  - (a) To implement daily maintenance of outside plant efficiently through a centralized management system
  - (b) To train personnel's knowledge and technique on telephone outside plant maintenance using standard method and system which has been developed on OPMC Model Center in Bandung
5. Project Description : - The project is composed of:
  - (a) Review of the operation of the OPMC in Bandung and field survey
  - (b) Basic design
  - (c) Detailed design
  - (d) Preparation of tender document
6. Project Duration : 12 months
7. Project Cost : Feasibility study: US\$ 500,000  
Implementation : US\$ 3,500,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under contract process (Japanese OECF loan) as of January 1990

Code Number: G-27

1. Project Title : EDUCATION AND TRAINING CENTER EXPANSION
2. Location : Medan, North Sumatra
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To meet the practicing laboratory at training center of WITEL-I in Medan
5. Project Description : - The project will be on a turnkey basis covering:
  - (a) Field survey
  - (b) Detailed engineering design
  - (c) Procurement and installation of switching, transmission, power supply, and telegraphy laboratories
6. Project Duration : 36 months
7. Project Cost : US\$ 2,400,000
8. Related to Project Aid: None
9. Stage of Project Preparation : On-going with local funds as of January 1990

Code Number: G-28

1. Project Title : LONG TERM PLAN FOR LOCAL TELECOMMUNICATION NETWORK IN MULTI EXCHANGE AREA
2. Location : Medan, North Sumatra
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : To establish the long-term plan for local telecommunication network in multi exchange area
5. Project Description :
  - 1) General analysis of present situation of telecommunications facilities
  - 2) Field survey with regard to telecommunications demand and cable network
  - 3) Data collection and discussion with staff from municipalities and POSTEL/PERUMTEL
  - 4) Forecasts on 1. Municipality development,  
2. Telecommunications demand, and  
3. Traffic
  - 5) Preparation of Telecommunication Network Plan
  - 6) Preparation of Telecommunication Network Implementation Plan
6. Project Duration : 12 months
7. Project Cost : US\$ 1,100,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: G-29

1. Project Title : SUMATRA KOTAMADYA LOCAL TELEPHONE NETWORK EXPANSION (I)
2. Location : Padang, Bukittinggi and Payakumbuh, West Sumatra
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To fulfill and support the following requirements for the telephone and non-telephone services:
  - (a) To accommodate the existing waiting applicants
  - (b) To reduce waiting period for new subscription
  - (c) To improve service grade
  - (d) To promote regional economic activities
  - (e) To modernize telecommunication facilities
5. Project Description : - Provision of telephone service facilities in accordance with demand including the following:
  - (a) Digital switching system (for local and toll switching systems)
  - (b) Local cable network
  - (c) Transmission system
  - (d) Power plant
  - (e) Building and land
6. Project Duration : 240 months
7. Project Cost : US\$ 75,600,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Partly on-going as of January 1990

Code Number: G-33

1. Project Title : COIN TELEPHONE SETS PROVISION
2. Location : Padang and other kotamadyas and kabupatens which have automatic switching centers
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To fulfill and support the following requirements for the telephone and non-telephone services:  
(a) To improve accessibility to telephone service  
(b) To promote regional economic activities
5. Project Description : - Provision of coin telephone sets in accordance with the needs
6. Project Duration : 240 months
7. Project Cost : US\$ 720,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: G-35

1. Project Title : TELEPHONE OUTSIDE PLANT MAINTENANCE CENTER (OPMC)
2. Location : Padang, West Sumatra
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - The OPMC is required to fulfill the following functions:
  - (a) To implement daily maintenance of outside plant efficiently through a centralized management system
  - (b) To train personnel's knowledge and technique on telephone outside plant maintenance using standard method and system which has been developed on OPMC Model Center in Bandung
5. Project Description : - The project is composed of:
  - (a) Review of the operation of the OPMC in Bandung and field survey
  - (b) Basic design
  - (c) Detailed design
  - (d) Preparation of tender document
6. Project Duration : 12 months
7. Project Cost : Feasibility study: US\$ 500,000  
Implementation : US\$ 3,200,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Preliminary study was completed



Code Number: G-36

1. Project Title : EDUCATION AND TRAINING CENTER EXPANSION
2. Location : Padang, West Sumatra
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To meet the practicing laboratory demand at training center of WITEL-II in Padang
5. Project Description : - The project will be on a turnkey basis covering:
  - (a) Field survey
  - (b) Detailed engineering design
  - (c) Procurement and installation of switching, transmission, power supply and telegraphy laboratories
6. Project Duration : 36 months
7. Project Cost : US\$ 2,400,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Preliminary study was done by PERUMTEL

Code Number: G-37

1. Project Title : LONG TERM PLAN FOR LOCAL TELECOMMUNICATION LOCAL NETWORK IN MULTI EXCHANGE AREA
2. Location : Padang, West Sumatra
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives :
  - Yearly expansion plans must always be based on the latest long term plan according to the stage of city development
  - To establish the long term plan for local telecommunication network in multi exchange area
5. Project Description :
  - 1) General analysis of present situation of telecommunications facilities
  - 2) Field survey with regard to telecommunications demand and cable network
  - 3) Data collection and discussion with staff from municipalities and POSTEL/PERUMTEL
  - 4) Forecasts on 1. Municipality development,  
2. Telecommunications demand, and  
3. Traffic
  - 5) Preparation of Telecommunication Network Plan
  - 6) Preparation of Telecommunication Network Implementation Plan
6. Project Duration : 12 months
7. Project Cost : US\$ 800,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: G-38

1. Project Title : INTRODUCTION OF RURAL TELECOMMUNICATIONS
2. Location : Mentawai islands, West Sumatra
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To fulfill and support the following requirements for the telephone and non-telephone service:
  - (a) To improve accessibility to telephone service
  - (b) To promote regional economic activities
  - (c) To ensure social equity
5. Project Description : - Feasibility study of introduction of rural telecommunication  
- Basic/detailed engineering design  
- Procurement of transmission system, power plant, building system  
- Construction of rural telecommunication network
6. Project Duration : Feasibility study: 6 months  
Implementation : 12 months
7. Project Cost : Feasibility study: US\$ 700,000  
Implementation : US\$ 1,000,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: G-39

1. Project Title : SUMATRA KOTAMADYA LOCAL TELEPHONE NETWORK EXPANSION (I)
2. Location : Pekanbaru and Batam Island, Riau
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To fulfill and support the following requirements for the telephone and non-telephone services:
  - (a) To accommodate the existing waiting applicants
  - (b) To reduce waiting period for new subscription
  - (c) To improve service grade
  - (d) To promote regional economic activities
  - (e) To modernize telecommunication facilities
5. Project Description : - Provision of telephone service facilities in accordance with demand including the following:
  - (a) Digital switching system (for local and toll switching system),
  - (b) Local cable network,
  - (c) Transmission system,
  - (d) Power plant,
  - (e) Building and land
6. Project Duration : 240 months
7. Project Cost : US\$ 103,200,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Partly on-going as of January 1990

Code Number: G-45

1. Project Title : PACKET DATA COMMUNICATION SYSTEM (SKDP)  
EXPANSION
2. Location : Batam Island, Riau
3. Executing Agency : Directorate General of Posts and  
Telecommunications, Ministry of Tourism,  
Posts and Telecommunications
4. Objectives : - To improve and extend Data Communication  
Network to enable to serve the demand of  
data communication which is growing  
rapidly  
- To promote regional economic activities
5. Project Description : - The project is composed of:  
(a) Detailed engineering design  
(b) Procurement of packet switching  
equipment, data transmission  
facilities and accessories  
(c) Delivery, insurance, installations  
(d) Testing and commissioning  
(e) Maintenance support  
(f) Training
6. Project Duration : 240 months
7. Project Cost : US\$ 20,000,000
8. Related to Project Aid: None
9. Stage of Project  
Preparation : Under promotion

Code Number: G-46

1. Project Title : COIN TELEPHONE SETS PROVISION
2. Location : Pekanbaru and other kotamadyas and kabupatens which have automatic switching centers
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To fulfill and support the following requirements for the telephone and non-telephone service:
  - (a) To improve accessibility to telephone service
  - (b) To promote regional economic activities
5. Project Description : - Provision of coin telephone sets in accordance with the needs
6. Project Duration : 240 months
7. Project Cost : US\$ 1,200,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: G-49

1. Project Title : SOUTH RIAU DIGITAL MICROWAVE SYSTEM
2. Location : Riau
3. Executing Agency : Directorate General of Posts and Telecommunications, Ministry of Tourism, Posts and Telecommunications
4. Objectives :
  - To fulfill and support the following requirements for the telephone and non-telephone services:
    - (a) To accommodate the existing waiting applicants
    - (b) To improve accessibility to telephone service
    - (c) To promote regional economic activities
5. Project Description :
  - Feasibility study of introduction of rural telecommunication
  - Basic/detailed engineering design
  - Procurement of transmission system, power plant, building, access road, and tower
  - Construction of digital microwave system
6. Project Duration : Feasibility study: 7.5 months  
Implementation : 36 months
7. Project Cost : Feasibility study: US\$ 900,000  
Implementation : US\$ 8,000,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: H-3

1. Project Title : CONSERVATION AND MANAGEMENT OF PROTECTED WILDLIFE
2. Location : Aceh and Riau
3. Executing Agency : Ministry of Forestry in cooperation with Ministry of Population and Environment (KLH)
4. Objectives :
  - To establish conservation and management systems of protected wildlife and their habitats
  - To reduce damages of agricultural crops by protected wildlife and to mitigate complains of local people
  - To establish a proper utilization plan for land and natural resources
5. Project Description :
  - Investigation of ecological conditions of protected wildlife especially elephant, and their habitats
  - Analysis and consideration of wildlife reserves and national parks for protected animals
  - Estimation of damages to agriculture products by protected animals especially by elephants
  - Consideration of mitigation measures which contribute to attain harmonious co-existence between protected animals and local people
  - Preparation and implementation of protected wildlife conservation and management plan
6. Project Duration : 36 months
7. Project Cost : US\$ 1,000,000
8. Related to Project Aid: No information available
9. Stage of Project Preparation : Under promotion



Code Number: H-6

1. Project Title : RE/AFFORESTATION
2. Location : Central Aceh, Aceh
3. Executing Agency : Ministry of Forestry
4. Objectives : - To rehabilitate forested areas and  
grassland as part of northern Aceh  
Integrated Development Program  
- To disseminate the importance of soil  
conservation through re/afforestation
5. Project Description : - To study the current status of forest and  
grassland utilization and establish  
priority areas for re/afforestation  
- To initiate pilot projects at selected  
locations for demonstration
6. Project Duration : 48 months
7. Project Cost : Expert services US\$ 240,000  
Equipment US\$ 300,000  
Fellowship US\$ 120,000  
Total US\$ 660,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: H-7

1. Project Title : WATERSHED MANAGEMENT TECHNOLOGY CENTER (WMTC) & FORESTRY EDUCATION AND TRAINING CENTER (FETC)
2. Location : Aek Nauli, Sibatuloteng Forest Area, North Sumatra
3. Executing Agency : Directorate General of Reforestation and Land Rehabilitation, Center for Forestry Education and Training, Agency for Forestry Research and Development, Ministry of Forestry
4. Objectives :
  - To support the operations such as land rehabilitation, soil conservation and greening in the deteriorated watershed areas in the Region by organizing technological development
  - To make an efficient performance by training site-workers, and farmers to execute soil conservation, reforestation and greening
  - To utilize facilities and personnels organically and efficiently as a single unity with already initiated construction of Forest Research and Development Center (FRDC)
5. Project Description : The Ministry of Forestry established Master Plan by planning to set up Forestry Complex centralizing WMTC and FETC with FRDC. FRDC was started by the assistance from the World Bank from 1987, but the remaining two have not started the construction yet because of financial reasons.  
According to the Master Plan, the total construction area is 49 ha, and forests for Research and Training is 3,182 ha.
6. Project Duration : 36 months
7. Project Cost : US\$ 11,000,000
8. Related to Project Aid: Forestry Institution and Conservation Project (IBRD)
9. Stage of Project Preparation : Under promotion

Code Number: H-8

1. Project Title : RE/AFFORESTATION DEVELOPMENT
2. Location : Nias Island, North Sumatra
3. Executing Agency : Directorate General of Reforestation and Land Rehabilitation, Ministry of Forestry/North Sumatra Provincial Government
4. Objectives :
  - To preserve water and soil by establishing productive forest and reserve forest through reforestation in current bare land and second growth land in the Nias forest area
  - To aim economical development in the Island by producing forest products through conversion from non-productive land into rich forest areas
  - To improve self-sufficiency of forest products, construction materials and firewood
  - To increase employment by executing the above operations
5. Project Description : 40,000 ha of artificial reforestation shall be accomplished with 10 years; 20,000 ha is from productive forest, and the rest 20,000 ha from reforestation and soil conservation on the reserved forest based upon land utilization divided by the Government. In future wood processing industry is aimed to be built in order to use forest products from the productive forest lands. Besides the above productive land, 3,000 ha of social forest and private forest shall be established with 10 years by promoting and guiding reforestation on the disposed land as nonforest land, second growth land, etc. Those activities contribute to own use materials and firewood, and local peoples' income. In consequence, better understanding of forest function in the environment shall be enhanced and forest fire could be reduced.
6. Project Duration : 10 years
7. Project Cost : US\$ 36,500,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: H-9

1. Project Title : AGROFORESTRY DEVELOPMENT
2. Location : North Tapanuli and South Tapanuli, North Sumatra
3. Executing Agency : Ministry of Forestry  
Ministry of Agriculture
4. Objectives : - To establish an effective system of agroforestry as part of Medan Integrated Development Program
5. Project Description : - To study the current status of agricultural and forest land utilization and identify suitable models to integrate agricultural and re/afforestation efforts  
- To initiate pilot projects to disseminate and train foresters and key farmers
6. Project Duration : 60 months
7. Project Cost :

Expert services	US\$ 300,000
Equipment	US\$ 300,000
Fellowships	US\$ 150,000
Total	<u>US\$ 750,000</u>
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: H-10

1. Project Title : REHABILITATION OF CRITICAL AREAS
2. Location : North Tapanuli and South Tapanuli, North Sumatra
3. Executing Agency : Ministry of Forestry
4. Objectives : - To rehabilitate critical areas through regreening efforts as part of Medan and South Tapanuli Integrated Development programs
5. Project Description : - To study the current status of critical areas and identify priority locations with suitable models of regreening  
- To initiate pilot projects to disseminate and train foresters and local population
6. Project Duration : 60 months
7. Project Cost :

Expert services	US\$ 240,000
Equipment	US\$ 300,000
Fellowship	US\$ 120,000
Total	<u>US\$ 660,000</u>
8. Related to Project Aid: None
9. Stage of Project Preparation : Under preparation

Code Number: H-11

1. Project Title : RIVER CLEANING PROGRAM (PROKASIH)
2. Location : North Sumatra
3. Executing Agency : Ministry of Population and Environment (KLH)
4. Objectives :
  - To monitor existing water quality conditions and pollution loads of the rivers
  - To establish water quality pollution control and management system
  - To improve environment conditions of the rivers
5. Project Description :
  - Investigation of existing water quality conditions and pollution loads of hazardous substances of the selected rivers (Deli River, Asahan River, Semayang River, Merbau River)
  - Preparation of river water cleaning program by setting up waste water discharge control
  - Implementation of urgent countermeasures to reduce pollution loads to the rivers
  - Establishment of environmental monitoring and management system
6. Project Duration : 12 months
7. Project Cost : US\$ 1,500,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: H-12

1. Project Title : REFORESTATION AND AGROFORESTRY SYSTEM DEVELOPMENT
2. Location : Tanah Datar and Agam, West Sumatra
3. Executing Agency : Ministry of Forestry  
Ministry of Agriculture
4. Objectives : - To establish an effective system of reforestation and agroforestry as a part of Minang Highlands integrated Development Program
5. Project Description : - To study the current status of agricultural, forest and grassland utilization and identify suitable models to integrate agricultural and re/afforestation efforts  
- To initiate pilot projects to disseminate and train foresters and key farmers
6. Project Duration : 60 months
7. Project Cost : Expert services US\$ 400,000  
Equipment US\$ 400,000  
Fellowships US\$ 150,000  
Total US\$ 950,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: H-14

1. Project Title : RE/AFFORESTATION DEVELOPMENT
2. Location : Indragiri Hulu District, Riau
3. Executing Agency : Directorate General of Reforestation and Land Rehabilitation, Ministry of Forestry/Riau Provincial Government
4. Objectives : - To establish model project to enlarge social and private forests by promoting and guiding re/afforestation in the many such lands that are non productive and deteriorated land as being disposed on the conditions of grass land, second growth land or rubber land in the Forest lands which are not managed by the Ministry of Forestry
5. Project Description : 5,000 ha of social forest and private forest shall be established with 10 years through re/afforestation.  
And the nursery to provide the above seedlings shall be provided.  
In order to expand various use of forest products, researches and study of their products shall be performed for the processing, utilization and/or market-ability.
6. Project Duration : 10 years
7. Project Cost : US\$ 3,000,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion



Code Number: I-1

1. Project Title : TOURISM MANAGEMENT TRAINING PROGRAM
2. Location : Four Provinces (Aceh, North Sumatra, West Sumatra, and Riau)
3. Executing Agency : Directorate General of Tourism, Ministry of Tourism, Posts and Telecommunications
4. Objectives :
  - To develop and promote the tourism industry by providing training programs for management staffs in various occupations in the government sector as well as in the private sector in the region
5. Project Description :
  - 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, and tourism consultants
  - To develop the training system and programs, both pre-service and in-service trainings
  - To assist the Government to build and open a new training institute in the region
6. Project Duration :
  - Preparation study : 18 months
  - Technical cooperation after the study : 60 months
7. Project Cost :
  - Preparation study : US\$ 1,800,000
  - Technical cooperation and a facility : US\$ 18,000,000
8. Related to Project Aid: Tourism Education and Training Institutes in Bandung and Bali
9. Stage of Project Preparation : Under promotion

Code Number: I-3

1. Project Title : LAKE LAUT TAWAR AND THE VICINITY DEVELOPMENT
2. Location : North and Central Aceh, Aceh
3. Executing Agency : Directorate General of Tourism, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To identify tourism facilities with high economic feasibility as well as to establish an appropriate system of nature conservation and relevant tourism facilities in support of rural development programs
5. Project Description : - To evaluate existing tourism facilities and related infrastructure and identify requirements for future development including accessibility improvement from Lhokseumawe, Banda Aceh and other gateways  
- To undertake a feasibility study on tourism-related infrastructure, facilities and nature conservation schemes  
- To conduct engineering design and construction works
6. Project Duration : Preparation study and feasibility study : 18 months  
Engineering design and construction : 36 months
7. Project Cost : Preparation study and feasibility study : US\$ 1,800,000  
Engineering design and construction : US\$ 60,000,000
8. Related to Project Aid: No information available
9. Stage of Project Preparation : Under promotion

Code Number: I-6  
(See also F-24)

1. Project Title : LAKE TOBA AND THE VICINITY TOURISM DEVELOPMENT
2. Location : North Sumatra
3. Executing Agency : Directorate General of Tourism, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To develop and utilize tourism objects with great potential compared with the tourism objects in the region, and to strengthen the area's leading role in tourism
5. Project Description : - To review and update the 1979 JICA Tourism Master Plan  
- To undertake a feasibility study on tourism-related minimum infrastructure, facilities, information services and tourism software to improve its management in the tourism industry and enhance tourism objects in the area; The study covers the ring road on Samosir Island, a betterment of the road section between Brastagi and Pangururan via Parapat, urban infrastructure improvement in Parapat  
- To conduct detail design and construction works
6. Project Duration : Feasibility study : 12 months  
Engineering design and construction : 36 months
7. Project Cost : Feasibility study : US\$ 1,500,000  
Engineering design and construction : US\$ 29,000,000
8. Related to Project Aid: Master Plan on Tourism development in North and West Sumatra (JICA), 1979
9. Stage of Project Preparation : Under promotion

Code Number: I-8

1. Project Title : NIAS ISLAND TOURISM DEVELOPMENT
2. Location : Nias, North Sumatra
3. Executing Agency : Directorate General of Tourism, Ministry of Tourism, Posts and Telecommunications
4. Objectives :
  - To develop and utilize tourism objects with high development potential and to strengthen the island's economic base
5. Project Description :
  - To evaluate existing tourism objects, facilities and related infrastructure, and to identify requirements for future development including accessibility improvement from Sibolga and Medan
  - To undertake a feasibility study on tourism-related minimum infrastructure and facilities taking account of development potential of marine sports, beach resort and unique cultural heritage
  - To conduct engineering design and construction works
6. Project Duration :
  - Preparation study and feasibility study : 12 months
  - Engineering design and construction works: 36 months
7. Project Cost :
  - Preparation study and feasibility study : US\$ 1,200,000
  - Engineering design and construction : US\$ 30,000,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: I-9

1. Project Title : MINANG HIGHLANDS TOURISM DEVELOPMENT
2. Location : Bukittinggi and the vicinity (including South Solok), West Sumatra
3. Executing Agency : Directorate General of Tourism, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To develop and utilize tourism objects with high potential, and to strengthen the area's important role as one of major tourists' destinations and the network of excursion routes with other destinations, especially with Lake Toba area
5. Project Description : - To review and update the 1979 JICA Tourism Master Plan  
- To undertake a feasibility study on tourism-related minimum infrastructure, facilities, information services and tourism software to improve its management in the tourism industry and enhance tourism objects in the area
6. Project Duration : Feasibility study : 12 months  
Engineering design and construction : 36 months
7. Project Cost : Feasibility study : US\$ 1,500,000  
Engineering design and construction : US\$ 60,000,000
8. Related to Project Aid: Master Plan on Tourism development in North and West Sumatra (JICA), 1979
9. Stage of Project Preparation : Under promotion

Code Number: I-12

1. Project Title : BATAM ISLAND AND BINTAN ISLAND MARINE TOURISM DEVELOPMENT
2. Location : Riau
3. Executing Agency : Directorate General of Tourism, Ministry of Tourism, Posts and Telecommunications
4. Objectives : - To develop marine tourism objects and related infrastructure in the islands which will become one of major tourists' destinations from and via Singapore, and to stimulate economic activities as a forward and backward linkage of the tourism activities in the islands
5. Project Description : - To formulate a technical plan of infrastructure such as:
  - (a) road improvement to Nongsa, Batam Center and Bukit Pancur in Batam Island
  - (b) road network, water supply, electricity, telecommunications, sewerage, drainage in Bintan Island- To provide guidance for construction works
- To implement construction works
6. Project Duration : Engineering design: 12 months  
Construction : 36 months
7. Project Cost : Engineering design: US\$ 1,200,000  
Construction : US\$ 30,000,000
8. Related to Project Aid: Marine Tourism Plan for Indonesia (UNDP), 1988
9. Stage of Project Preparation : A pre-feasibility study was done by UNDP in 1988

Code Number: J-1

1. Project Title : URBAN AND RURAL WATER SUPPLY PROGRAM I (IKK WATER SUPPLY SYSTEMS)
2. Location : Sub-district capitals (IKK) in Aceh, North Sumatra and Riau
3. Executing Agency : Directorate General of Human Settlements, Ministry of Public Works
4. Objectives :
  - To provide safe and stable supply systems of portable water for urban and rural communities to satisfy basic human needs, to improve public health and to stimulate economic activities
5. Project Description :
  - To evaluate the current IKK water supply programs
  - To investigate alternative water sources (ground water, spring, river, etc.) with due considering to energy sources for operation and maintenance
  - To formulate an overall plan for the IKK water supply systems in the area
  - To conduct a feasibility study on priority IKKs
  - To implement construction works
6. Project Duration : Feasibility study: 12 months  
Engineering design  
and construction : 36 months
7. Project Cost : Feasibility study: US\$ 1,200,000  
Engineering design  
and construction : US\$ 30,000,000
8. Related to Project Aid: Water supply projects in Aceh and West Sumatra under the bilateral aid from the Netherlands and West Germany
9. Stage of Project Preparation : Under preparation

Code Number: K-3

1. Project Title : SUMATRA SECONDARY CITIES URBAN DEVELOPMENT PROGRAM
2. Location : 4 Provinces (Aceh, North Sumatra, West Sumatra, Riau)
3. Executing Agency : Directorate General of Human Settlements, Ministry of Public Works
4. Objectives : - To support Integrated Urban Infrastructure Development Programme (IUIDP) for small and medium size cities and to increase the effectiveness of their urban services, and also to strengthen implementation and management capabilities of the local Government and concerned Government agencies
5. Project Description : - To formulate a package program of urban infrastructure development with intersectoral balance for each city and to implement the program  
- Technical assistance to strengthen the local Government capability
6. Project Duration : 48 - 60 months
7. Project Cost : US\$ 200,000,000
8. Related to Project Aid: IUIDP supported by UNDP, UNCHS, IBRD and ADB
9. Stage of Project Preparation : ADB loan is expected to be approved in 1989



Code Number: K-4

1. Project Title : BANDA ACEH DRAINAGE PROJECT
2. Location : Banda Aceh, Aceh
3. Executing Agency : Directorate of Human Settlements, Ministry of Public Works
4. Objectives : To support Integrated Urban Infrastructure Development Programme for Banda Aceh, whose most urgent planning element is urban drainage
5. Project Description :
  - To revise the drainage plan of Banda Aceh taking account of effects brought about by the Krueng Aceh flood control project by OECF loan
  - To prepare a detail design
  - To implement construction works for the area with high priority
6. Project Duration : Detail design with revision of the existing drainage plan : 18 months  
Construction : 36 months
7. Project Cost : Detail design and construction : US\$ 25,000,000
8. Related to Project Aid: IUIDP supported by ADB
9. Stage of Project Preparation : Feasibility Study completed by ADB in 1988 and a construction work for 400 ha will be financed by ADB

Code Number: K-5

1. Project Title : KAMPUNG IMPROVEMENT SUPPORT PROGRAM
2. Location : Aceh (Banda Aceh, Lhokseumawe, Langsa, etc.)
3. Executing Agency : Directorate General of Human Settlements,  
Ministry of Public Works
4. Objectives : - To support Kampung Improvement Programme (KIP) which is one of 12 planning elements in the Integrated Urban Infrastructure Development Programme (IUIDP), and to improve living conditions of the population in major urban areas in the region, and of the low income groups in particular
5. Project Description : - To evaluate the current KIP programs  
- To formulate an overall plan for KIP with high priority in the Urban areas in the province  
- To implement construction works
6. Project Duration : Feasibility study : 9 months  
Engineering design  
and construction : 24 months
7. Project Cost : Feasibility study : US\$ 1,000,000  
Engineering design  
and construction : US\$ 10,000,000
8. Related to Project Aid: IUIDP supported by ADB  
Small Towns Sanitation Project for Aceh by  
the Netherlands
9. Stage of Project Preparation : Under promotion

Code Number: K-7

1. Project Title : URBAN DRAINAGE AND SOLID WASTE PROGRAM
2. Location : North Sumatra (Sibolga, Tanjung Balai and Kisaran)
3. Executing Agency : Directorate General of Human Settlements, Ministry of Public Works
4. Objectives : - To formulate several integrated pilot projects of drainage network and solid waste management system improvement, to respond to growing environmental health protection demands in the areas, and to improve living environment in the strategic urban development centers in the province
5. Project Description : - To evaluate the existing drainage network and solid waste management system in each urban area  
- To formulate integrated pilot projects for selected areas with high priority including the system management training program  
- To implement construction works
6. Project Duration : Feasibility study : 12 months  
Engineering design and construction : 24 months
7. Project Cost : Feasibility study : US\$ 1,500,000  
Engineering design and construction : US\$ 40,000,000
8. Related to Project Aid: IUIDP supported by UNDP/UNCHS  
Lower Asahan Flood Control and Irrigation Project by OECF (D/D)
9. Stage of Project Preparation : Under promotion

Code Number: L-2

1. Project Title : RURAL TECHNOLOGY EXTENSION PROGRAM
2. Location : 4 Provinces (Aceh, North Sumatra, West Sumatra, Riau)
3. Executing Agency : Directorate General of Rural Development, Ministry of Home Affairs
4. Objectives :
  - To increase the capability of the Government administration in the efforts of training rural leaders as development agent so as to encourage more active roles of rural people in the national development activities
  - To increase and encourage people's initiative to be sufficient for the development of their own communities
5. Project Description :
  - To provide training program and system for rural development extension workers (KPD) to render their services to solve rural problems
  - To introduce the most appropriate technology to encourage rural economic development with particular emphasis on the increased roles of women and youth
  - To formulate pilot projects in support of the program implementation
6. Project Duration :
  - Preparation study : 18 months
  - Technical cooperation after the study : 60 months
7. Project Cost :
  - Preparation study : US\$ 1,800,000
  - Technical cooperation after the study : US\$ 20,000,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Under promotion

Code Number: L-4

1. Project Title : AREA DEVELOPMENT PROGRAM FOR PIDIE AND ACEH BESAR
2. Location : Aceh (Pidie and Aceh Besar)
3. Executing Agency : Directorate General of Regional Development, Ministry of Home Affairs
4. Objectives : - To establish an integrated Area Development Program for Pidie and Aceh Besar:
  - (i) to raise agricultural production and farmer's income by improving irrigation systems, through diversified agricultural development
  - (ii) to enhance the living standard of the population
5. Project Description : - To conduct a preparatory study to identify areas, target people and planning components for the program  
The identification is based on studies such as natural condition survey, socio-economic condition survey, agricultural potential survey, infrastructure survey and so forth
  - To organize the program and components identified into an integrated Area Development Program
  - To implement the program
6. Project Duration : Preparation study: 24 months  
Implementation : 96 months
7. Project Cost : Preparation study: US\$ 2,400,000  
Implementation : US\$ 50,000,000
8. Related to Project Aid: Provincial Area Development Program by USAID, Aceh Area Development by the Netherlands
9. Stage of Project Preparation : Under promotion

Code Number: L-6

1. Project Title : AREA DEVELOPMENT PROGRAM FOR TAPANULI SELATAN
2. Location : North Sumatra (Tapanuli Selatan)
3. Executing Agency : Directorate General of Regional Development, Ministry of Home Affairs
4. Objectives : - To establish an integrated area development program for Tapanuli Selatan:
  - (i) to increase the income of inhabitants through diversified agriculture and related agro-industry developments
  - (ii) to enhance the living standard of the population
5. Project Description : - To conduct a preparatory study including preparation of topographic survey, socio-economic benchmark survey and related study on the diversified agricultural development and the development potential for agro-industry
  - To organize the program and components identified into an integrated Area Development Program
  - To implement the program
6. Project Duration : Preparation study: 24 months  
Implementation : 96 months
7. Project Cost : Preparation study: US\$ 2,400,000  
Implementation : US\$ 50,000,000
8. Related to Project Aid: Third Irrigation Sector Loan by ADB
9. Stage of Project Preparation : Under promotion

Code Number: L-13

1. Project Title : AREA DEVELOPMENT PROGRAM FOR RIAU ISLANDS
2. Location : Kabupaten Kepulauan Riau, Riau
3. Executing Agency : Ministry of Home Affairs
4. Objectives :
  - To stimulate the local economy by providing basic economic and social infrastructures
  - To eliminate economic isolation
5. Project Description :
  - Following small-scale components are possible alternatives to be included in the program:
    - (1) Small holder rubber/coconut plantation improvement
    - (2) Fishing villages community development
    - (3) Road network development
    - (4) Medical service by boat clinic ("sailing doctor")
6. Project Duration :
  - Preparation study: 18 months
  - Implementation : 96 months
7. Project Cost :
  - Preparation study: US\$ 700,000
  - Implementation : US\$ 1,200,000
8. Related to Project Aid: None
9. Stage of Project Preparation : Project idea

### III. GUIDELINE FOR STUDY (GFS)

Notes to the users of the Guideline for Study (GFS):

- (1) Those GFS's are drafted for discussion purpose only by the JICA Team with the Counterpart Team and, therefore, is subject to change after discussion and further review before finalization for actual follow-up action.
- (2) Those GFS's by no means imply any commitment by JICA or by the Japanese government.
- (3) Man-months and costs indicated in the GFS's are all provisional.
- (4) A Government Regulation of the Republic of Indonesia (No.29, year 1986) pertaining to analysis of impacts upon the environment stipulates that all development projects take environmental aspects into consideration. In accordance to this Regulation, due attention should be given to environmental aspects should be given whether or not it is explicitly stated in the GFS's.





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## STUDY ON ANIMAL NUTRITION AND MARKETING IMPROVEMENT\*

### 1. BACKGROUND

#### 1.1. Location

The project will be located in Kabupaten Aceh Utara or Kabupaten Aceh Tengah, Aceh Province.

#### 1.2. Project's Role

One of the major agricultural policies of the current five-year plan is to sustain and/or improve national food self-sufficiency in a broad sense. With regard to rice production, Indonesia has been remarkably successful in achieving self-sufficiency, but for livestock and secondary food crops, a great deal still remains to be done for the provision of effective institutional supports in order to strengthen the national and regional capacity of supplying to the growing domestic market.

Livestock raising is more important in Aceh Province, compared with the other three provinces in the Northern Sumatra Region. According to the agricultural census of 1983, the average size of cattle herd per farming household in Aceh was 3.3 heads, the highest among the four provinces. According to the provincial statistics, the total ruminant populations of cattle, buffaloes and goats were about 400,000, 470,000 and 400,000 heads respectively in 1987. Kabupaten Aceh Utara had the largest populations, accounting for 34%, 27% and 30% respectively. This is reflected in the number of registered slaughters: of the provincial total of about 27,000 heads of cattle, Aceh Utara accounted for a little over 40%. In addition, the province exported live cattle and buffaloes of about 13,000 heads chiefly to the neighboring countries, and the share of Aceh Utara was 47%.

Major problems of animal husbandry in Aceh, as elsewhere in Indonesia, are inadequate animal nutrition and animal disease control, and lack of effective processing and marketing infrastructure, all of which need be improved in order to increase meat production. Many cattle kept by farmers graze on paddy fields after harvest and roadside natural grass, while the existing cattle farms require better pasture and forage management. Animals often suffer from brucellosis, haemorrhagic agents (Septicaemia, Anaplasmosis and Piroplasmosis), and internal/external parasitic agents, but veterinary services is yet insufficient in the province. Approximately twenty small slaughter houses are said to be in operation, with total daily capacity of less than a hundred heads of cattle and buffaloes. These slaughter houses are mostly public facilities and the quality of slaughtering is very poor.

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The project will contribute to the national objective of raising the level of meat consumption in general, and increase the supply to the growing provincial and regional markets, especially in major urban centers, as well as raising the income of livestock farmers. In the long run, the project will help foster local livestock processing industry which can supply quality meat to wider markets, both domestic and external.

## 2. THE PROJECT

The project aims to strengthen training and extension programs which will serve to promote market-oriented livestock farming and meat production, such as improved animal nutrition and fattening practices and hygienic slaughtering and meat processing for supplying sophisticated urban markets. The basic activities of the project are (i) improvement of pasture and forage management to raise the grazing capacity, (ii) improvement of fattening practices possibly with supplementary feeding, (iii) training and demonstration programs for slaughtering and meat processing.

A feasibility study of two abattoirs, one at Banda Aceh and the other at Lhokseumawe, was undertaken in 1986 by a Belgian team, but its estimated financial internal rate of return was low, at 7.6% for Banda Aceh and 9.2% for Lhokseumawe. Considering the national objective of improving nutritional standards and food self-sufficiency in a broad sense, it will be important to launch a public-sector program integrating animal nutrition and fattening and meat processing.

## 3. OBJECTIVES OF THE STUDY

The objectives of the study are (i) to analyze the existing practices of animal nutrition and fattening and meat processing, (ii) to identify suitable training programs for improving the productivity of pastures and cattle and the technical standards of slaughtering and processing, and (iii) to suggest a suitable location and scale of operation for facilities which will undertake such programs.

In this regard, existing F/S Report should be reviewed in reference to present every livestock condition and back-stopped the project feasibility from the team's own fielding

## 4. SCOPE OF WORK

Major items to be studied are as follows:

- Analysis of the existing animal husbandry practices, and assessment of technical and socio-economic constraints for introducing improved livestock and natural pasture management
- Analysis of the existing slaughtering and meat processing activities and suitable measures for improvement
- Analysis of the existing marketing systems and future market prospects
- Suggestions on suitable training and demonstration programs on breeding and grazing/feeding practices and disease control, including major components of an external technical cooperation program

- Estimation of the required facilities and equipment for a model processing center.

## 5. EXECUTION OF THE STUDY

The executing agency is the livestock bureau (Dinas Peternakan) in close coordination/consultation with the provincial and kabupaten BAPPEDAs.

Fields of expertise and man-months are tentatively set as follows:

Economist (cum team leader)	10	m/m
Livestock farming specialist	10	m/m
Veterinary specialist	5	m/m
Meat processing specialist	5	m/m
Construction engineer	5	m/m
Environment Specialist	5	m/m

Time schedule is tentatively set for 8 months.





## 2. West Aceh IDEP

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## STUDY ON WETLAND FOOD CROP INTENSIFICATION AND DIVERSIFICATION\*

### 1. BACKGROUND

#### 1.1. Location

The project will be located in Kabupaten West Aceh, Aceh.

#### 1.2. Project's Role

One of the major agricultural policies of the current five-year plan is to improve and sustain the national food self-sufficiency in a broad sense. Because of the remarkable success achieved in rice production, the emphasis of agricultural development is now being shifted increasingly to the diversification of food crop production.

Kabupaten West Aceh is one of the underdeveloped west coastal areas of Aceh Province. The mainstay of the kabupaten economy is the agricultural sector, which is characterized by the relative dominance of wetland paddy and smallholder tree crops (rubber and coconut), with much reduced importance of dryland annual crops. Reflecting partly the extensive capacity of the existing wetland (49,000 ha) to produce more rice than the local level of consumption, and partly the physical difficulty of raising the level of utilization on wetland, the rice cropping intensity generally remains low (0.8).

In line with the policy objective mentioned above, the agricultural diversification can be best pursued on the existing wetland of West Aceh in order to raise the productivity of under-utilized wetland and increase income-earning opportunities for farmers in the under-developed area of the province.

### 2. THE PROJECT

The project mainly consists of five supporting activities as follows:

- (1) Development of rainfed wetland, particularly with provision of small-scale irrigation/drainage improvement
- (2) Introduction of secondary food crops (such as soybean, maize and peanut) and vegetables into the cropping pattern on wetland
- (3) Improvement of harvest and post-harvest operations and market-ing arrangements

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- (4) Strengthening or establishment of a rural extension center (or centers) with appropriate equipment and facilities for demonstration and manpower training
- (5) Introduction of appropriate mechanization to support the above components

### 3. OBJECTIVES OF THE STUDY

Prior to the implementation of the project, a study is needed to specifically formulate the project. The objectives of the study are (i) to critically analyze the existing cropping patterns on wetland, (ii) to identify effective measures to increase the wetland cropping intensity through diversification, and (iii) to suggest a range of institutional supports necessary to disseminate improved farming operations on wetland.

### 4. SCOPE OF WORK

Major items to be studied are as follows.

- Analysis of major technical and physical limitations of wetland farming, including post-harvest operations
- Identification of major socio-economic factors for the low utilization of wetland, such as availability of labor and draft animal or mechanical power, marketing arrangements and access to institutional supports
- Analysis of the prospects of major markets and local processing for selected secondary and horticultural food crops
- Suggestions on feasible measures for promoting wetland food crop intensification and diversification

### 5. EXECUTION OF THE STUDY

Executing agency is the agricultural bureau (Dinas Pertanian) with close coordination/consultation with the provincial and kabupaten BAPPEDAs.

Fields of expertise and man-months necessary are as follows:

Crop Science Specialist (Team Leader)	6	m/m
Irrigation specialist	4	m/m
Post-harvest specialist	3	m/m
Agricultural machinery specialist	3	m/m
Agricultural economist	6	m/m

Duration of the study will be 6 months.



## FEASIBILITY STUDY ON SMALL-SCALE FISHERY DEVELOPMENT (WEST ACEH) \*

### 1. BACKGROUND

#### 1.1. Project Area

The Project will cover coastal water of West Aceh. Fishing activities in West Aceh concentrated in the area closed to Meulaboh, namely, Kec. Sama Tiga, Johan Palawan, and Kaway XVI, where about 70% of total marine fish of this Kabupaten are landed, while about 200 ha of tambak (brackishwater ponds) were recently opened in the northern end of West Aceh. Although the coastal water of West Aceh is suitable for purse seine fishing as certified that most of purse seiners of Banda Aceh operate in this region, there is no local purse seiner at present. The marine fish catch (1988) was 7,467 MT, mainly caught by hook & line and gill nets. At present some fresh fishes are transported to Medan (15 hrs. by car) and Banda Aceh (9 hrs. by car), ice required therefor are brought by fish buyers, because of no ice plant for fisheries use in the region.

#### 1.2. Project's Role

Fish catch in the west coast of Sumatra has favorably increased from 80,408 Mt in 1982 to 127,965 MT in 1987, while the catch of Malacca Straits has been stagnating at the level of 330,000 MT per annum, the same level as the estimated MSY (maximum sustainable yield). In order to meet the increasing local and export demands, it is indispensable to further develop the fisheries resources including those of offshore of the western water of Sumatra. The project area, as aforementioned, is facing to a good purse seine fishing ground within its 12-mile territorial water. The development of purse seine fishing is prospective, upon improvement of the following constraints.

- a) Far access to market because of the lack of sufficient transportation and communication network.
- b) Lack of appropriate fisheries infrastructural facilities, i.e. fish landing place, ice plant, marketing equipment.
- c) Low technical level of fishermen and limited manpower availability.
- d) Weak organization, particularly cooperation society.

### 2. THE PROJECT

#### 2.1. Objectives

The objectives of the Project is to upgrade small-scale fishermen and to strengthen fishermen's association/cooperatives through provision of governmental support on fish marketing and fishing ground

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preparation. Furthermore, it is aimed at expansion of coastal fishing capacity with supply of fishing fleet and gears to fishermen.

## 2.2. Project Components

The Project will include Part A: Government support to Fishermen's Association/Cooperatives and Part B: Credit Component.

### Part A: Government Support to Fishermen's Association/Cooperatives

#### Component 1. Artificial Reef Installation

The Project will include installation of artificial reefs which model will be designed at the proposed Sibolga Marine Fisheries Development Sub-Center. The number, scale and locations of reefs will be determined in discussion with the Sub-Center, cooperatives and the Project consultants. In the initial years, the floating reefs, so called fish aggregating device (FAD) mainly for purse seine and lift net fishing will be emphasized in this component. The artificial reefs including nearby fishing ground are expected to be managed by the respective fishermen's association/cooperatives.

#### Component 2. Small-Scale on-shore Facilities

The Project will include improvement of small-scale on-shore facilities by which fish marketing capacity is expected to expand. The areas where required with these facilities are mostly isolated from markets due to inconvenient road and sea transportation. In order to expand the existing fish marketing scale, the fishermen's association/cooperatives will be strengthened so as to involve in fish marketing.

##### a) Fish landing jetty/wharf with fish auction shed

Rehabilitation of the existing jetty/wharf including dredging of navigation channel will be required in Meulaboh, so that 20 GT class purse seiners can utilize the facilities. The slipway with small workshop for fishing boat up to 20 GT will be also constructed in Meulaboh.

##### b) Ice plant and fish/ice storage

Small-scale ice plant (1-2 tons/day block ice) will be installed at Meulaboh. The ice will be used only for long-distance transportation of fresh fish, to Medan and Banda Aceh. About 15m<sup>3</sup> ice/fish storage (-0 C) will be also facilitated for temporary stock of fish for 1 or 2 days in each location. In addition, for fish transport purpose, each one 1-ton insulated truck and about 100 pieces of plastic fish container (60 liter) will be supplied.

#### Component 3. Staff Training of Fishermen's Association/Cooperatives

The fishermen's association/cooperatives in Meulaboh will be improved, with provision of intensive on-the-job training of cooperatives activities (fish marketing, credit and fishing ground management). For this purpose, one local government staff who will act as manager of project cooperatives will be intensively trained in overseas country for 6 months and in private fish trading company in Indonesia for another 6 months.

### Part B: Credit Component

The Project will include credit to small-scale fishermen or group of fishermen who will be selected and provided with cooperatives collateral for credit.

The project area is suitable for purse seine fishing development. About 15-20 GT wooden-hull purse seiners will be introduced and operated in the coastal water of West Aceh. The vessels will be provided to the selected fishermen or fishermen's group by credit.

Assuming that one vessel can catch 200 ton/year (1 ton/trip x 200 trips) and about 25% or 10,000 MT of the remaining potential pelagic fish stock can be exploited in this region, 50 units of purse seiners can be operated in the region.

### 3. SCOPE OF WORK

#### 3.1. General

The Study will include:

- a) Review and assessment of the existing status of fishing, fish marketing, fisheries-related infrastructure, organization/institution, and credit activities;
- b) Justification of appropriate scale of each project component, including number of sub-borrowers for fishing fleets and gear, capacity and location of on-shore facilities;
- c) natural environmental survey, i.e. boring test, depth survey, site measurement, bench mark survey, which will be necessary for determining design of project facilities;
- d) basic design of project components reflecting some design developed at the proposed Sibolga Sub-Center;
- e) Preparation of detailed implementation plan including time schedule, financing plan and necessary institutional arrangements;
- f) Estimation of required cost and manpower for project implementation; and,
- g) Feasibility evaluation of the entire project in technical, financial, socio-economic, manpower, and institutional aspects.

#### 3.2. Specific

##### (a) Fisheries Resources Aspect

The western water of Sumatra has a rich fish stock, which are not fully exploited in general, but in specific, catches of shrimps and skipjack have already exceeded the estimated MSY levels. The skipjack resource should be carefully analyzed in connection with purse seine fishing development.

##### (b) Fishing Technological Aspect

Due to a strong wave action and fast current, fish aggregating device (FAD) is easy to be moved away as experienced in West Sumatra in 1987-88. The design not for a large-scale but small scale for shallow water use should be developed at initial stage. The Consultant will



review all past experiences of FAD and/or artificial reefs not only in Indonesia but also in neighboring countries, including those to be developed in the proposed Sibolga Marine Fisheries Development Sub-Center, and will analyze its feasibility, paying a specific consideration on the oceanographic and conditions.

In addition, the Consultant will evaluate suitability of the proposed fishing gear and method to be applied to each project area, based on the past performance made by the related institution

(c) Fisheries Infrastructure Aspect

Most of the existing provincial fish landing centers (PPIs), which are located in the river mouth, are suffered from heavy siltation causing difficulty if timely call of fishing boats. Onshore facilities such as ice plant, fish auction shed and forwarding equipment are lack in the project areas. In addition to the limited access to the market, these insufficient fisheries infrastructure makes fishing village isolate even though there is a large potential fisheries resources. In relation with fish marketing aspect, the Consultant will review the existing fisheries infrastructure, and will prepare an appropriate improvement plan on feasible scale.

(d) Fish Marketing Aspect

Ice supply in the project area is very limited, almost all fishes for regional market are dealt without ice. Local people in west coast of Sumatra historically seems not to prefer iced-fish. Ice is used only for long-distance transportation, but no iced-fish are seen at local markets. As well, fishing boats do not use ice because of short trip and iced-fish price seems not to differ with non-iced-fish if not perished. Although it is recommended to use ice from sanitary aspect, ice demand should be carefully analyzed taking into consideration of local food habit and the cost added by ice.

(e) Institutional Aspect

In the project areas, which are generally remote from major domestic markets and fish marketing system in not well established or not well functioned, it is important to establish a due organization like cooperatives, which will activate marketing. The existing cooperatives are weak both in managerial and financial points of view. The Consultant will examine the possibility to enroll cooperatives as a core operational body in the Project including how to improve and strengthen their activities and institution. The possible government support may be indispensable for doing so. The institution and organization concerning to fish marketing i.e. auction system to be adopted, differ by each province. The Consultant should recommend appropriate measure and possible government support taking into consideration of provincial own ideas.

(f) Socio-economic Aspect

The main objective of the Project is to upgrade small-scale fishermen. The Consultant will assess fishermen's socio-economic status by type, scale and location, identify the underlying constraints, and recommend a measure to be taken for step-by-step upgrading.

(g) Manpower Aspect

It is expected that fishermen of east coast may change their fishing ground to west coast gradually. The Consultant will assess the difference between fishermen of east and west coast, and will recommend how to promote conversion of fishing activity from east to west. At time when main fishing ground moves to west coast, some local fishermen will have a chance to be employed. It is necessary to upgrade their technical status beforehand not only for generation of skilled manpower but also for improving their own living standard. The Consultant will analyze necessary manpower including method and scale of manpower improvement.

#### (h) Credit Aspect

Some of government banks are reluctant to provide loans to artisanal fishermen who can not submit appropriate collaterals. On correspondence may be a crucial point. In the similar fisheries project in west Sumatra, a loan was released to a group of fishermen, in order to reduce a individual debt amount to the level which the bank does not require any collateral. This system, however may not be applicable to all cases, because some fishermen does not prefer to joint and some are not willing to get any loan. The Consultant will recommend an adequate method of approach for promoting credit activity, in consideration of credit amount, number of sub-borrowers and cooperatives involvement.

### 4. EXECUTION OF THE STUDY

#### 4.1. Executing Agency

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

#### 4.2. Expertise and Man-Months

Total of 12 man-months covering fisheries economics, fishing technology, fish marketing, infrastructure, credit/finance and institution will be needed for formulating the detailed scope of the Project and making a feasibility study analysis.

#### 4.3. Time Schedule

The Study will be completed within 4 months after commencement of field services.



## FEASIBILITY STUDY ON IRRIGATED AGRICULTURE

### DEVELOPMENT IN WEST ACEH\*

#### 1. BACKGROUND

##### 1.1. Project Area

West Aceh falls in the most intensive rainfall zone caused by the monsoon effect on the Barisan mountain range. The rainfall is abundant throughout the year without significant drop in the dry months. As shown in Figure 1, the annual average rainfall is 3,600 mm and the monthly rainfall exceeds 200 mm even in the driest month.

Though West Aceh is rich in water resources, these resources have not been utilized effectively, probably due to frequent flooding, difficulty in drainage, sparse population, handicapped geographical location and lack of infrastructures. In and around Meulaboh, there are a number of rivers which have large catchment as shown in Figure 2. They are as follows:

<u>River name</u>	<u>Catchment area (km<sup>2</sup>)</u>
Teunom	2,331
Woyla	2,284
Meureubo	1,740
Tripa	3,981

In Kab. West Aceh, there is a wet land of 49,100 ha in total, of which 10,300 ha is irrigated (1986). Kab. West Aceh produced 132,100 tons of paddy from the total harvested area of 38,100 ha in 1986. This production accounts for about 13 % of the provincial total, while the population share is 11%. At present, rehabilitation and extension works of the Jureum irrigation scheme (12,377 ha) are being carried out with financial support from the OECF sector loan. Further, some potential irrigable sites for sizable schemes are identified as follows:

<u>Scheme</u>	<u>Area (ha)</u>	<u>Water Source</u>
Lambalek	1,200	Woyla River
Tanjung Seumantok	1,000	Meureubo River
Lhok Guci	21,300	Meureubo River
Kr. Tripa	23,000	Tripa River

On the other hand, inundation by flood water occurs very frequently particularly in the Woyla and Meureubo river basins. The habitual flood prone area is reportedly 3,400 ha on the Woyla and 4,200 ha on the Meureubo respectively. Some countermeasures for flood control and drainage are required for the development of the area.

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The west coast belt of Aceh is designated as the agricultural zone by the provincial government in contrast with the industrial zone on the northern part. In line with this policy, rice production which needs a large quantity of water would be justified in West Aceh where vast land and abundant water are available, and the above listed schemes would play an important role for sustaining the self-sufficiency of rice for the growing population, if proper practice is introduced in irrigation, drainage, seed selection, farm operation, post-harvest processing, etc.

Aceh Province as a whole has produced surplus of rice to its provincial demand. The total surplus estimated on desk is approximately 40 % and no significant deficit appears to occur in each kabupaten. The per-capita production of rice in West Aceh was about 250 kg in milled rice (1986), which is much higher than the national average consumption rate. The population of West Aceh would increase to 462,000 in 2008 from 294,000 in 1988, indicating an increase of 57 % for 20 years.

Another development potentials are identified in Meulaboh and its surroundings. They are, firstly, hydropower potentials in the upstream reaches of Kr. Woyla, Meureubo and Tripa. The second is a coal mine reserve north of Meulaboh. The surveys on these potential natural resources are expected to be done by the agencies concerned.

## 1.2. The Project

In order to sustain rice production not only for the increased regional consumption but also for the required surplus to outer-provinces, further expansion of irrigable areas will be necessary on higher potential areas.

Though rice production would be a mainstay to the majority of farmers for years to come, possible shift to diversification of crops should be searched positively but carefully for improving nutrition and raising farm income, subject to soil suitability, farmers' inclination to crops, marketability, etc. Further, as a drainage problem is one of the major constraints to raising agricultural productivity, some countermeasures are keenly required.

The above situation suggests the necessity of an overall and in-depth study on irrigated agriculture in and around Meulaboh which is expected to grow as a service center or strategic center of the west coast belt of Aceh.

## 1.3. West Aceh IDEP

A feasibility study on irrigated agriculture development project in West Aceh is contemplated as a priority project under a framework of the West Aceh IDEP, which aims at the integrated regional development of Kab West Aceh. The proposed study will form an integral element for the West Aceh IDEP, since agricultural development supported with land and water resources in and around Meulaboh would be a key to income generation of farmers, employment creation and the socio-economic development of the Region.

## 2. OBJECTIVES OF THE STUDY

The objectives of the study are to conduct a feasibility study on irrigated agriculture mainly for rice and palawija production in the

potential areas such as Lambalen, Tanjung Seumantok, Lhok Guci and Kr. Tripa.

The study will be conducted in two phases: Phase I aims at identifying potentials and constraints for irrigated agricultural development in the area and selection of high priority scheme(s) and Phase II aims at conducting a feasibility study on selected priority scheme(s).

### 3. SCOPE OF WORK

#### 3.1. General

The proposed study area is in potential irrigable areas which exist at Lambalek, Tanjung Seumantok, Lhok Guci and Kr. Tripa in the vicinity of Meulabouh. In the Phase I study, more stress is placed on identification of quick yielding schemes, besides the larger scale development from the long perspective in accordance with the basic survey on farmers' socio-economic background, their intention for agricultural development, land ownership and marketing aspects.

The Phase II study will follow a conventional approach to formulating irrigation and drainage schemes of high priority for rice and diversified crops.

#### 3.2. Major Items to Be Studied

The study will include the following items:

##### Phase I:

- (1) Review the previous studies and existing data and materials relevant to the project;
- (2) Carry out the comparative survey on the following items for agricultural development;

-Topography

-Geology

-Soil

-Meteoro-hydrology

-Flood damage and drainage conditions

-Land use and land capability

-Land tenure

-Cropping pattern and farming practice

-Processing and storage facilities

-Agricultural support services

-Farmers' intention on diversified crops

- (3) Carry out the socio-economic survey on the following items;

- Infrastructure such as water supply, electricity, road, etc.
- National and regional economy
- Regional development plan on infrastructures and investment program
- Transmigration programs

- (4) Assess the environmental impacts of agricultural development, regarding forest conservation, change of river flow regime and soil conservation;
- (5) Conduct a marketing survey on rice and palawija such as maize, peanuts, cassava, soybeans, green-peas, etc.;
- (6) Identify quick yielding small schemes (less than or around a few hundred hectares), taking due consideration of the current performance of the ADB's 3rd Irrigation Sector Loan projects in the area;
- (7) Identify priority projects from the long range perspective; in screening the priority project, the following criteria may be applied for comparison;

- Maximization of production in the area

- Maximization of number of beneficiaries and employment generation

- Maximization of total net income and net income per unit area

#### Phase II:

- (1) Continue further in-depth survey and study same as done in Phase I for the selected priority schemes, if necessary;
- (2) Prepare topographic maps on the selected priority schemes, and
- (3) Conduct a feasibility study on the selected schemes and formulate irrigated agriculture development projects, including necessary flood protection works.

#### 4. EXECUTION OF THE STUDY

##### 4.1. Executing Agency

The executing agency of the project will be the Directorate General of Water Resources Development, Ministry of Public Works. Coordination with and support from other ministries and agencies and local government concerned will be arranged by the IDEP Unit to be established in BAPPEDA. Technical assistance for the study is expected to be provided by foreign experts under the official development assistance program.

##### 4.2. Expertise and Man-Months

For executing the study, the following experts will be required:

- Team leader

- Irrigation engineer
- Drainage engineer
- Hydrologist
- Geologist
- Pedologist
- Agronomist
- Agro-economist
- Regional economist
- Topographic and mapping expert

The man-months required for executing the study will be 90 man-months.

#### 4.3. Time Schedule

The duration of the study will be 18 months in total, 10 months being allocated for Phase I and 8 months for Phase II.

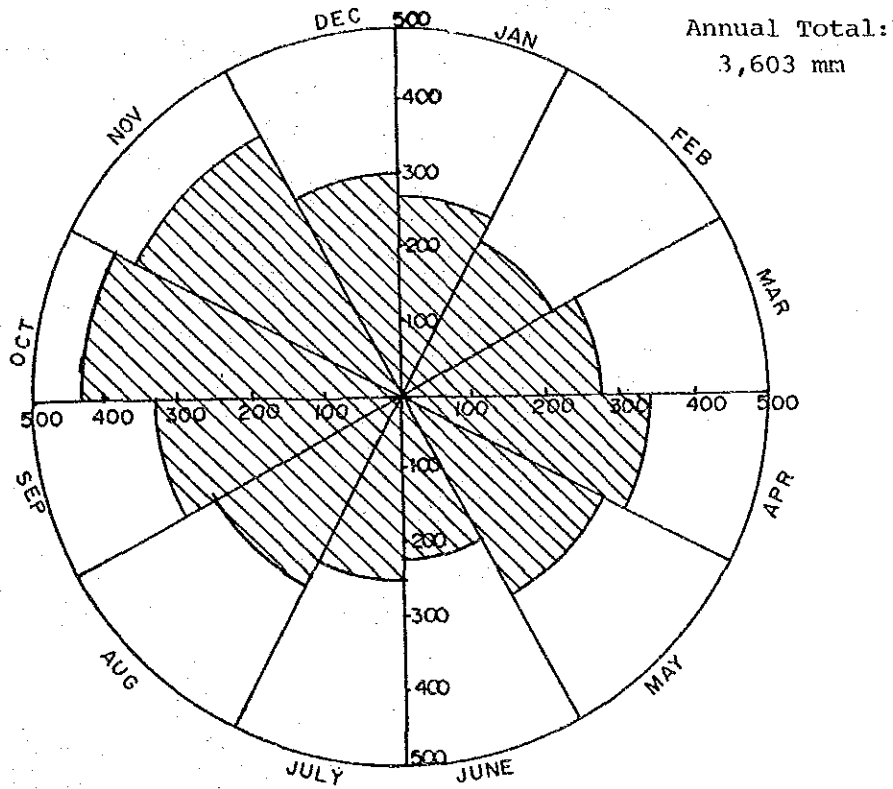


Fig. 1. Monthly Average Rainfall at Meulaboh (1931 - 1970)



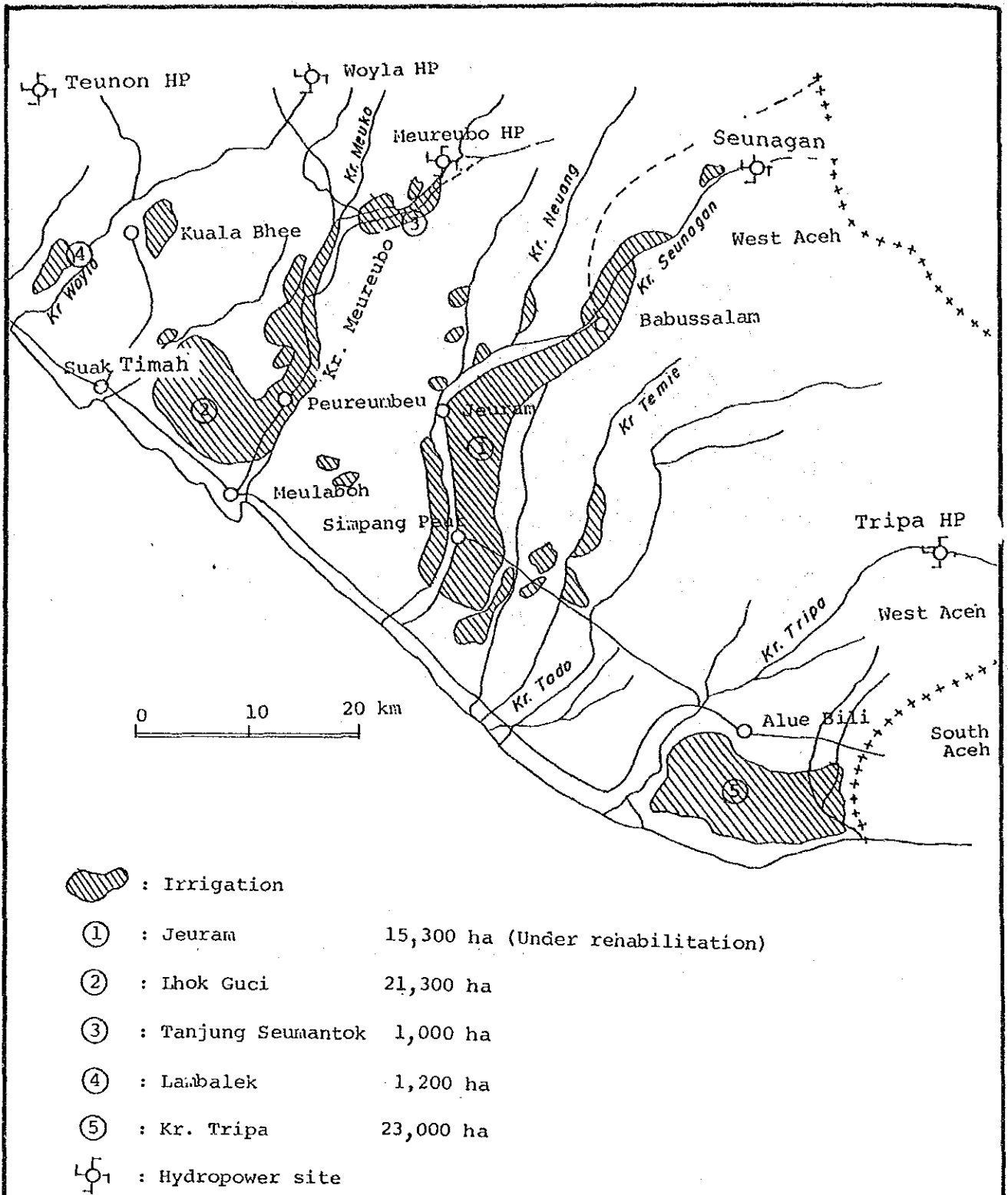


Fig. 2. Potential Irrigation Area and Hydropower Development Site



## PRE-FEASIBILITY STUDY ON HYDROPOWER DEVELOPMENT IN WEST ACEH\*

### 1. BACKGROUND

#### 1.1. Project Area

Aceh Province is generally abundant in water resources endowed with rainfall. West Aceh, among others, is situated in the most intensive rainfall zone, influenced by the monsoon effects on the Barisan mountain range. The average annual rainfall is 3,500 mm to 3,700 mm at Meulaboh, Calang and Jeuram.

However, these water resources have not been fully utilized for the regional development, probably due to sparse population, lack of infrastructures, difficulties in accessibility, etc. For example, double cropping of rice is practised only on 15% of the total wet land, while rice production could be intensified through introduction of proper irrigation and drainage. Further, electricity supply in the area is made by operating isolated diesel plants which use fuel of high cost, and the current electrification rate and consumption rate remain at a lower level.

#### 1.2. The Project

PLN (Wilayah I) has identified a number of potential hydropower sites in the area, though the status of identification is at a desk study level or preliminary reconnaissance level. The potential sites thus identified are listed in Table 1 and their locations are presented in Figure 1. Most of the potential sites are located on the upstream reaches of Kr. Teunom, Woyla, Meureubo, Seunagan and Tripa.

On the other hand, potential coal reserves of approximately 500 million tons are identified north of Meulaboh. These reserves have a brighter prospect for power generation and industrial use though the potentials need to be confirmed by a further study.

The energy demand in West Aceh is projected to grow to 279 GWh with a peak load of 55 MW in 2008 from the present level of 15 GWh and 13 MW. This level of energy consumption is still small to the potentials of indigenous energy sources. However, in line with the national policy of energy diversification or use of indigenous energy sources, hydropower development potentials should be exploited to their maximum extent as far as they are economically justified in due comparison with other alternative generating sources. Further, in order to materialize the interconnection of isolated power grids and installation of high voltage transmission lines in future aiming at more stable and economical supply of energy, further in-depth study on hydropower potentials in West Aceh are prerequisite.

Under these circumstances, it is firstly recommended to conduct a pre-feasibility study on hydropower development in West Aceh.

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### 1.3. West Aceh IDEP

The proposed study will constitute an integral part of the West Aceh IDEP which gives a priority on water resources development for the development of West Aceh.

## 2. OBJECTIVES OF THE STUDY

The objectives of the study are to conduct a pre-feasibility study on hydropower development in West Aceh in the long-term perspective particularly in due comparison with coal-fired plant and to identify a quick yielding small or mini hydroplant in the area in the short term.

## 3. SCOPE OF WORK

### 3.1. General

The proposed study area is in the river basins including Kr. Teunom, Woyla, Meureubo, Seunagan and Tripa mainly situated in West Aceh.

### 3.2. Major Items to Be Studied

The study will include the following items:

- (1) Review the previous studies and existing data and materials relevant to hydropower development schemes in the area; covering topographic maps, meteohydrology, geology and seismology, soils, land uses, power market, socio-economy;
- (2) Identify all possible hydropower development potentials in the basins based on existing topographic maps and aerophoto readings;
- (3) Conduct field reconnaissance of the schemes preliminarily evaluated as prospective for the purpose of confirming topographic and geologic condition specific to the sites;
- (4) Prepare an inventory of hydropower schemes of mini, small and large size;
- (5) Conduct a study on power market data, demand projection, system expansion programs of generating facilities and transmission lines, costs and supply condition of diesel plants, consumption and prices of fuels, captive powers, etc.;
- (6) Conduct in-depth investigation for promising schemes on the following items:
  - Topography
  - Geology
  - Construction materials
  - Hydrology
- (7) Estimate cost and benefit of hydropower schemes based on alternative thermal plant;
- (8) Assess the environment and sociological aspects related to the development of hydropower schemes;

- (9) Select a few priority schemes from short and long range perspectives to be taken up in the subsequent feasibility study; and
- (10) Prepare detailed terms of reference for the feasibility study on the schemes and recommendation on follow-up action program.

#### 4. EXECUTION OF THE STUDY

##### 4.1. Executing Agency

The executing agency for the study will be PLN (State Electricity Corporation), Ministry of Mines and Energy. Coordination with and support from other ministries and agencies concerned will be arranged by the IDEP Unit to be set in BAPPEDA, Aceh. Full information on coal mine development in Meulaboh should be provided in this study by the Ministry of Mines and Energy.

##### 4.2. Expertise and Man-Months

The following expertise will be required to conduct the study:

Team Leader

Hydroelectric power planner

Dam engineer

Hydraulic engineer

Geo-technical engineer

Hydrologist

Electric engineer

Road planner

Environment specialist

Economist

The total man-months required will be about 65 man-months.

##### 4.3. Time Schedule

The duration of the study will be about 12 months in total.

Table 1. Potential Hydropower Schemes in West Aceh

PLN's Code	Name	Type	MW	GWh	Catchment (km <sup>2</sup> )
11-01	Tripa 3	RES 1)	78.0	341.8	1,298
11-02	Tripa 4	RES	89.0	389.7	2,038
11-03	Tripa/Sapi	RES	164.7	207.9	2,038
12-01	Seunaga 3	ROR 2)	13.1	68.9	312
13-01	Meureubo 1	RES	35.0	153.3	325
13-02	Meureubo 2	RES	14.6	76.8	415
13-03	Meureubo 4	RES	70.3	308.0	809
13-04	Meureubo 5	ROR	19.4	102.1	876
13-05	Meureubo/Seunagan	RES	95.7	419.2	325
14-01	Pameeno	RES	80.1	350.8	888
14-02	Woyla 1	RES	81.8	358.1	1,273
14-03	Woyla 2	RES	122.4	536.3	1,337
15-01	Inong	ROR	9.9	52.2	94
15-02	Laumeih	ROR	7.6	67.7	205
15-03	Teunom 1 3)	RES	41.1	179.9	889
15-04	Teunom 2	RES	106.5	466.5	1,866
15-05	Teunom 3	RES	131.8	577.2	2,115

Notes: 1) RES: Reservoir type development  
 2) ROR: Run-of-river type development  
 3) Pre-feasibility study finished in 1987 for the scale of 24.2 MW with 195 GWh.

Source: Interim Report for HPPS, Nov. 1982.

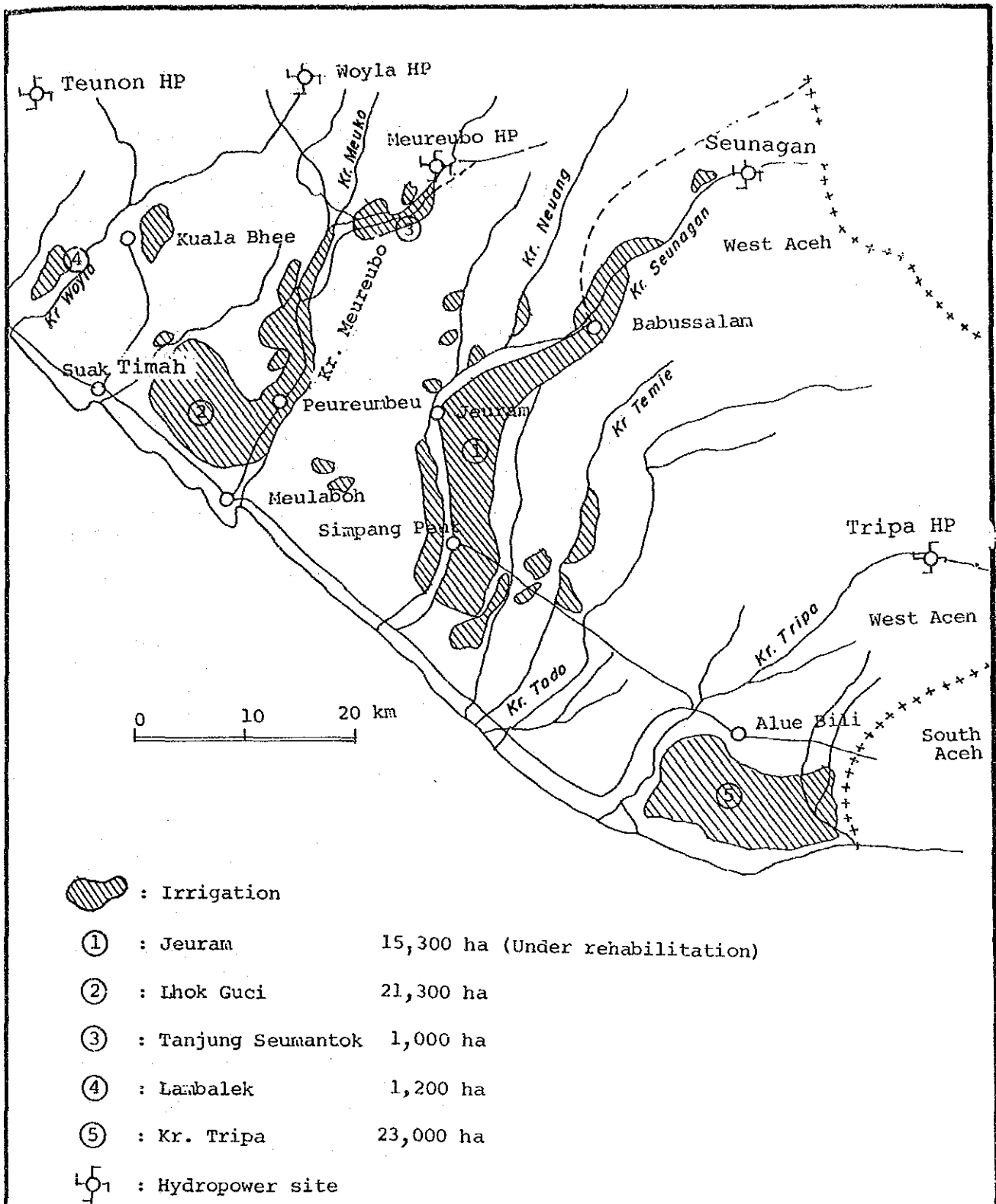


Fig. 1. Potential Irrigation Area and Hydropower Development Site



## CONSULTING SERVICES FOR DETAILED DESIGN AND CONSTRUCTION OF BANDA ACEH - MEULABOH ROAD BETTERMENT\*

### 1. BACKGROUND

In the "Study on the Integrated Regional Development Plan for the Northern Part of Sumatra (LTA-78)" by JICA in 1989, the "West Aceh Integrated Development Program (IDEP)" is proposed as one of the IDEPs to be concentrated for regional development. The study area for the "West Aceh IDEP" is kabupaten of Aceh Barat, whose capital is Meulaboh. The area is 12,100 km<sup>2</sup> in size with a population of 345,000.

In the "West Aceh IDEP", it is pointed out that transportation systems such as roads and port are inevitable for the transportation of increased agricultural products and import of commodities for daily life from the view point of civil minimum. As for the road development in the area, road networks have yet to be developed except for some parts of arterial roads.

The road link between Meulaboh and Tapaktuan in the kabupaten of Aceh Selatan was completed in 1987 as paved road assisted by West Germany. The unpaved part of the link between Banda Aceh and Meulaboh is under construction assisted by CIDA (Canadian Government) and will be completed by 1991. CIDA's project covers 106 km of betterment, namely from the point of 120 km to that of 226 km from Banda Aceh, out of 248 km length between Banda Aceh and Meulaboh.

In Repelita V, the road link between Banda Aceh and Meulaboh is ranked as the national road. However, most of the paved part of the link is in fair or poor condition and there are some critical road sections which fall below the practical design standards of national roads in terms of alignment and slope protection.

Under such circumstances, it is recommended to execute the detailed design and construction of Banda Aceh - Meulaboh Road.

### 2. PROPOSED PROJECT

The project road is located between Banda Aceh and Meulaboh along the west coast of Aceh province which will be a part of the West Coast Sumatra Highway in the future. This road, starting from Banda Aceh, runs through mountains, coastal and swamp areas, and connects to Meulaboh, the kabupaten capital of Aceh Barat. The Project will cover the following road construction:

- (1) Road betterment from the point of 0 km to that of 120 km from Banda Aceh including road alignment improvement and slope protection,
- (2) Road betterment from the point of 226 km to that of 248 km from Banda Aceh, and

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- (3) Construction of feeder roads to be connected with Banda Aceh - Meulaboh road.

### 3. OBJECTIVES OF THE PROJECT

The objectives of the project are to support agricultural development in the "West Aceh IDEP" and to promote the realization of balanced socio-economic development in the region.

### 4. SCOPE OF WORK

The scope of work for consulting services of the project shall cover the following items:

- (1) The engineering services for the detailed design, including:
  - a) Review of existing studies
  - b) Additional survey and investigations required for the detailed design
  - c) Preparation of the detailed design and cost estimate
  - d) Preparation of tender documents and tender drawings
  - e) Preparation of maintenance program for Banda Aceh - Meulaboh road
- (2) The engineering services for construction supervision, including:
  - a) Pre-construction engineering services
  - b) Supervision of the construction of betterment of road structures
  - c) Guidance and monitoring of maintenance operations

### 5. IMPLEMENTATION OF THE PROJECT

#### 5.1. Organization

The executing agency is the Directorate General of Highways (Bina Marga), the Ministry of Public Works of Indonesia. The Consultant for the project shall fully cooperate with all concerned Government agencies such as Central Bina Marga, Dinas Bina Marge (DBM) and Regional Public Works (Kanwil PU) in the province.

#### 5.2. Expertise and Man-Months

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

- (1) Project Manager
- (2) Highway Engineer
- (3) Quantity Surveyor
- (4) Structural Engineer
- (5) Soil/Material Engineer
- (6) Construction Engineer
- (7) Mechanical Engineer
- (8) Cost Estimator
- (9) Document Specialist
- (10) Topographic Surveyor
- (11) Inspection Engineer



5.3 Time Schedule

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



## STUDY ON THE ACEH WEST COAST PORT DEVELOPMENT\*

### 1. BACKGROUND

#### 1.1. Project Area (See attached Figure)

The site for the specific port development is located along the west coast of Aceh Province. This area covers the entire west coast of Aceh from the Port of Sabang and to the Port of Singkel.

#### 1.2. Project's Role

The west coast of Aceh extends about 600km and is exposed to severe wave conditions from the Indian Ocean especially in Northwest monsoon season. Along this coast, several ports have been developed as important transportation means for cargos and passengers. These ports include Sabang, Calang, Meulaboh, Susoh, Tapaktuan and Lohk Jamin.

However all of these ports, except for the Port of Lho'nga (a special port for a cement company), are located in the areas naturally sheltered from waves by capes without any artificial breakwaters. Hence, available water basins are generally limited in areas and water depths. Most of these ports are furnished only with small wooden piers.

Even the Port of Meulaboh, which is the leading port on the coast, has only one 55m-long, wooden berth and the statistics in 1988 shows the average ship waiting time of this port is as long as 60 hours. Judging from these current conditions, it is apparent that the existing port capacities are not sufficient for the future increase of cargo and passenger demand.

According to the description of a paper on the West Aceh IDEP, a large amount of agricultural products is expected to be produced in the near future in the IDEP area. In order to support these activities, the development of a relatively large scaled deep sea port (IDEP Port) is necessary together with the development of related road networks.

In response to this request, there are two basic alternatives for the development of the required IDEP Ports. One is the expansion of existing ports and the other is the development of a new port. The selection of the desirable alternative should depend upon various conditions such as the amount of cargo, locations of agricultural projects, natural conditions and access conditions.

As explained above, the capacities of existing ports are strictly limited; hence considerable expansion projects will probably require construction of breakwaters and dredging of water basins, even in the case of the expansion of existing ports.

Concerning the development potentials of the existing ports, the Port of Meulaboh is one of the most appropriate ports as IDEP Port

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because of its location (center of the west coast), access conditions (distance from agricultural project areas), area of the hinterland and concentration of population and related urban functions. However, this port suffers from shallow water due to sedimentation. Therefore, in the case of large scale expansion, a relatively large amount of investment will be required to maintain an adequate water depth.

Besides the Port of Meulaboh, there are several other ports as Sabang, Calang, Susoh, Tapaktuan and Lohk Jamin. The Port of Sabang played a very important role as a Free Port from 1970 through 1985 because of its unique location and good natural conditions. Although the economic activities of Weh island have remained at a low level since 1985, this island still has development potential. The Port of Sabang has the possibility to play a unique role in conjunction with the IDEP Port for the efficient promotion of the IDEP.

The Port of Calang is currently used as a special port for timber shipment. This port is perfectly sheltered by natural capes and its broad water basin is always calm. At present, a barge system is adapted because large ships are not allowed to berth at pier directly due to coral at the sea bottom, but this is not a serious constraint for future expansion. The point is the site location. If only one IDEP Port is necessary, the Port of Calang may not be appropriate as the IDEP Port because of its location, long distance from the center of the west coast. If multiple of IDEP Ports are required, the Port of Calang is one alternative.

The Port of Tapaktuan functions satisfactorily as a transportation node, however, the vicinity of Tapaktuan is mountainous and lacks sufficient space for the development. From this reason, this port is not considered to be appropriate as the ports to serve as an IDEP Port, although it is still one of the alternatives. The Ports of Susoh and Lohk Jamin do not have any advantageous characteristics as IDEP Ports compared with the above ports.

Besides these existing ports, a new site should also be considered as another alternative taking account of natural and socio-economic conditions. Concerning natural conditions such as waves and sedimentation, necessary surveys should be carried out for the efficient promotion of the project.

## 2. THE PROJECT

The project of the Aceh west coast port development consists of two elements. One is the selection of the most adequate sites for IDEP Ports development and the formulation of master plans and short-term plan for the selected IDEP ports. The other is the development of the IDEP Ports infrastructures based upon a master plan and a short-term plan.

Depending upon the intensity of the demand in the hinterland, a large-scaled IDEP Port may be required, and in this case, the IDEP Port project requires such works as i) construction of breakwaters, ii) dredging of water basins, iii) construction of berths, iv) construction of warehouses and yards, and v) provision of handling equipment. The dimensions of these facilities should be fixed after the proposed study.

## 3. OBJECTIVES OF THE STUDY

The objectives of this study are to promote the IDEP Port development project along the west coast. The principal items of the study consist of i) determination of the most suitable IDEP Port

development sites along the west coast, ii) formulation of the master plan for the IDEP Port development, iii) formulation of the short-term IDEP Port development plan and analysis of the feasibility of the short-term development plan.

#### 4. SCOPE OF WORK

The following items shall be covered in this study:

(1) to collect and analyze basic data on natural conditions, socio-economic conditions and related transportation conditions. Especially natural conditions are key factors for the selection of the IDEP Port site(s), hence the collection and analysis of the related data should be inevitable including the field surveys.

(2) to evaluate the existing conditions relative to port activities such as characteristics of cargo throughout and cargo and passengers flows, physical conditions of related facilities, natural conditions and port operation and management conditions.

(3) to identify the future locations and roles of ports along the west coast of Aceh considering natural conditions, future projects in the hinterlands, access roads conditions and other related conditions.

(4) to forecast the future traffic demand for the ports along the west coast of Aceh.

(5) to formulate the master plan for the development of the new port (or a large-scaled expansion of existing ports) which is specified through the evaluations in (1) to (4) above.

(6) to formulate the short-term port development plan for the port(s) specified above based upon the master plan.

(7) to design the layout of all facilities for the short-term development plan in sufficient detail including preliminary design.

(8) to carry out rough cost estimation for the short-term development plan and make a staged construction program, considering environmental aspects.

(9) to make economic and financial analysis for the short-term port development project and evaluate the feasibility of the project.

(10) to provide recommendations on port management and operations.

#### 5. EXECUTION OF THE STUDY

##### 5.1. Executing Agency

The Directorate General of Sea Communications (DGSC) of Ministry of Communications is in charge of port planning. Concerning construction, operation and management of existing commercial ports, the Public Harbor Cooperation (Perumpel I-IV) is in charge under the jurisdiction of the Ministry of Communications.

In the project area, the Port of Sabang and the Port of Meulaboh belong to Perumpel I, and other public ports are managed directly by DGSC.

##### 5.2. Expertise and Man-Months

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

Team leader

Port planner

Demand forecast expert

Port engineer

Oceanographic engineer

Port operation and management expert

Economic and financial analyses expert

In total 70 man-months will be required.

### 5.3. Time Schedule

Duration of the study will be 14 months.



Figure 1. Location of Main Ports in West Coast of Aceh



### 3. Metropolitan Medan IDEP

E-25	Natural Gas Utilization .....	241
F-22	Medan-Binjai Toll Road Development .....	243
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F-30	Railway Track Rehabilitation .....	250
I-6	Lake Toba and the Vicinity Tourism Development .....	254







## FEASIBILITY STUDY ON NATURAL GAS UTILIZATION\*

### 1. BACKGROUND

#### 1.1. Location

This project will be initiated in Medan.

#### 1.2. Supporting Information

With the discovery of natural gas at offshore of Pangkalan Brandan, it is necessary to carry out natural gas utilization study in order to obtain the maximum economic return for the Region's development from the said natural gas production. The field still needs a few more years to reach the proven reserve figures however, the product is envisaged to start in the end of Repelita V.

Currently available natural gas in the Region is estimated as 156 MMSCFD, (66 MMSCFD from Arun, 54 MMSCFD from Rantau, and 46 from Pangkalan Brandan). Arun 's 66 MMSCFD volume of natural gas is open for new utilization scheme. 54 MMSCFD of Rantau is currently consumed as second recovery sources.

### 2. OBJECTIVES OF THE STUDY

Objectives of this study is set as follows:

- (1) to find the most efficient way of natural gas utilization
- (2) Delineation of pipeline system to seize the above opportunities
- (3) Recommendation of projects to be implemented during Repelita V and VI

### 3. SCOPE OF THE STUDY

#### 3.1. General

This study should be carried out right after adequate enough information obtained on the reserve. This study should also review the now going on study of "Energy Pricing" by The World Bank in order to spell out advantages of use of the newly discovered natural gas in comparison to the national scheme of natural gas utilization scheme. As for economic value of the natural gas, there exists two methods. One is net back value method and the other is production cost plus depletion allowance. This study should carry out both method of valuing the natural gas (NG) so as to suggest the most plausible price for NG in view of acceleration of economic development in North Sumatra or specifically Medan area.

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### 3.2. Major Items to be Studied

- (1) Extent and value of NG for the power use, in comparison to the options available for power generation
- (2) Projection of the demand for direct use, feed stock, CLG and LPG
- (3) Estimates of economic value of natural Gas
- (4) Optional utilization scheme
- (5) Delineation of the utilization system
- (6) Cost estimates for utilization configuration
- (7) Recommendation for pricing and accelerated use of NG

## 4. EXECUTION OF THE STUDY

### 4.1. Executing Agency

The executing agency will be MIGAS.

### 4.2. Man-Months

In total about 40 man-months will be required.

### 4.3. Time Schedule

Duration of the study is for 6 months after obtaining the probable estimates on the reserve of Pangkalan Brandan.



## FEASIBILITY STUDY ON MEDAN - BINJAI TOLL ROAD\*

### 1. BACKGROUND

Medan is the fourth largest city in Indonesia with a population of 1.5 million people according to the 1985 national census. It is the provincial capital of North Sumatra and functions as the center of most economic, commercial and administrative activities in the northern part of Sumatra. Within the Kotamadya boundary and some twenty kilometers to the north of center of Medan city lies the largest port in Sumatra, Belawan.

Over the past few years, the number of vehicles, in Medan city and its surrounding areas (Medan Metropolitan Area) has grown remarkably at an average of 12% per annum. This high growth rate of vehicles has caused serious traffic congestion of the arterial road in the Medan area.

To cope with the increasing degree of motorization and to reduce traffic congestion in the Medan area, the construction of a tollway connecting Belawan, Medan and Tanjung Morawa was started by the Government in 1982 and was completed in March, 1987, which forms a backbone in the Region.

Binjai - Medan Tollway, proposed in the "Medan Area Transport Study" conducted by JICA in 1980, is considered to be implemented subsequent to the completion of the Belawan - Medan - Tg. Morawa Tollway. The project has been proposed to supplement the capacity of existing road and to complete the tollway network in the Medan Metropolitan Area. This Binjai - Medan Tollway is expected to function not only as a bypass of the existing Binjai - Medan road but also to stimulate and promote the regional development of the Project area and north-western part of the Medan Metropolitan Area.

Furthermore, the Project is proposed as one of the high-priority infrastructure components during Repelita V in the "Metropolitan Medan Integrated Development Program (IDEP)" formulated in the "Study on the Integrated Regional Development Plan for the Northern Part of Sumatra (LTA-78)" by JICA in 1989.

Under such circumstances, it is recommended to carry out a feasibility study on Binjai - Medan Tollway Project to confirm technical and economic feasibility of the project.

### 2. THE PROJECT

The Binjai - Medan Tollway is entirely a new construction project which connects Binjai and Medan. The project road is located on the northern side almost in parallel with the existing Binjai - Medan arterial road which is a part of the Trans-Sumatra Highway. This new road, starting from Binjai, runs through farm-land, estates, villages and some rice-fields and connects to Belawan - Medan - Tg. Morawa Tollway at the northern area of Medan city. The Project will cover the following road construction:

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- (1) Binjai - Medan Tollway, with length of approximately 24 km,
- (2) Feeder roads to be connected with the existing Binjai - Medan arterial road and proposed Tollway.

### 3. OBJECTIVE OF THE STUDY

The objective of the study is to examine the economic and technical feasibilities of the construction of a tollway to be connected between Binjai and Medan by consideration of the future traffic demand, effect of the existing Belawan - Medan - Tg. Morawa Tollway, the development program of other public transport sector, such as railway, and the future land use development plan. It is anticipated at present that a comprehensive land management study as well as urban transport study in the Medan Area will be completed in the near future, and results from these study shall be incorporated in the study.

### 4. SCOPE OF WORK

The study shall cover the following items:

- (1) Data collection and analysis
  - a) Review of existing reports and engineering data
  - b) General data
    - socio-economic aspects of the study area (population commerce and industry)
    - land use and committed development plan
    - transport conditions (road inventory and traffic conditions, traffic data, vehicle operating cost, existing public transport facilities and operation, etc.)
    - on-going, committed and proposed transport projects
- (2) Traffic survey and its analysis
  - a) Person trip survey
  - b) Freight distribution survey
- (3) Socio-economic study
  - a) Socio-economic framework
  - b) Land use including the distribution of population
- (4) Traffic study
  - a) Traffic generation
  - b) Traffic assignment
  - c) Modal split by trip purpose
- (5) Alternative study
  - a) Identification of the role of the project
  - b) Establishment of alternative routes

- c) Study on type of interchange
- (6) Field survey
  - a) Identification of control points
  - b) Soil and materials investigation and analysis
  - c) Hydrological survey and analysis
  - d) Topographic survey
  - e) Construction materials, labour and equipment survey
- (7) Preliminary engineering design
  - a) Geometric design of throughway, interchanges, feeder roads and intersections
  - b) Structure design including bridges, retaining walls, culverts, toll facilities, flyover, etc.
  - c) Pavement design
  - d) Right-of-way plans
- (8) Implementation program and cost estimate
  - a) Implementation program including stage construction
  - b) Cost estimate including construction cost, right-of-way acquisition cost, maintenance cost, etc.
- (9) Study on the viability of the project as a tollway
  - a) Study of toll fare
    - benefits
    - toll fare
  - b) Traffic volume on tollway
    - diversion rate on the basis of toll fare
    - forecast of future traffic on tollway
  - c) Construction timing and financial viability
    - construction timing
    - cost for toll system
    - repayment program
- (10) Project evaluation and socio-economic study
  - a) Estimation of benefit
  - b) Economic analysis (B/C, IRR, NPV and sensitive analysis)
  - c) Financial analysis
  - d) Socio-economic impact study

## 5. EXECUTION OF THE STUDY

### 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 80 man-months of foreign expatriates will be required to assist the executing agency for this study. The experts for this study as follows:

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

### 5.3. Time Schedule

The study is to be completed within fourteen (14) months after the commencement of the study.



## FEASIBILITY STUDY ON LAKE TOBA TOURISM ROAD DEVELOPMENT\*

### 1. BACKGROUND

The number of foreign tourists in Indonesia has been steadily increasing in recent years. The increased tourists are about 178 thousands people during the last 4 years, which is 1.3 times as large as that of four years ago. Presently the most attractive areas for foreign tourists are Bali and Java in Indonesia. Lake Toba in North Sumatra follows them.

The number of foreign tourists in the northern part of Sumatra has also been growing steadily. In particular, North Sumatra has recently received over 10% of the nation's total foreign tourists, which amounted to 107,490 in 1987. Lake Toba and its vicinity is one of the areas with the greatest tourism potential among tourists' spots in North Sumatra.

The area around Lake Toba is famous for its panoramic beauty, cool climate and traditional Batak culture. The center of the tourism area is Parapat. It takes about three hours by car from Medan to Parapat through the Trans-Sumatra Highway. However, other road networks, e.g., Lake Toba ring road, particularly Brastagi - Parapat, Samosir island ring road, have yet to be developed.

The road on the eastern bank of Lake Toba is to be upgraded as a tourism road. It will be the shortest route connecting Parapat and Brastagi and will also serve as a scenic route for viewing the lake and the Samosir island. This route is also expected to be an important part of circular tourism route from Medan. Furthermore, other road network development should be properly planned to develop and promote tourism in the area around Lake Toba and Medan.

The project is proposed as one of the high-priority projects during Repelita V in the "Metropolitan Medan Integrated Development Program (IDEP)" formulated in the "Study on the Integrated Regional Development Plan for the Northern Part of Sumatra (LTA-78)" by JICA in 1989.

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

### 2. OBJECTIVES OF THE STUDY

#### 2.1. Objectives

The objective of the study is to carry out a feasibility study on the tourism road development in the Lake Toba area, including the following items:

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- (1) To identify tourism potential and to formulate proper road network development for tourism in the area around Lake Toba,
- (2) To examine the economic and technical feasibilities of road network for tourism promotion, and
- (3) To prepare an implementation program for the road network development in the area.

## 2.2. Proposed Roads

The proposed roads included in the study will cover the road network around lake Toba as follows:

- (1) Medan - Brastagi - Parapat road
- (2) Lake Toba ring road
- (3) Samosir island ring road
- (4) Other feeder roads concerned the above

## 3. SCOPE OF WORK

In order to achieve the objectives mentioned above, the feasibility study shall include the following activities:

- (1) Collection and review of existing data relevant to tourism development in the study area
- (2) Identification of tourism potential in the study area
- (3) Study of socio-economic framework focused along the tourism development 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 along the road development schedule
- (8) Selection of priority of road links
- (9) Field surveys for soil and materials investigations and analysis, hydrological surveys and analysis, and topographic surveys for high priority road links
- (10) Determination of design policy, design criteria and standard
- (11) Preliminary engineering designs for high priority road links
- (12) Cost estimates including construction costs, right-of-way acquisition costs, maintenance costs, etc.
- (13) Economic evaluation and socio-economic impact study
- (14) Preparation of implementation program taking stage 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. Close cooperation should be done with the Directorate General of Tourism, the Ministry of Tourism, Post and Telecommunications of Indonesia.

##### 4.2. Expertise and Man-Months

It is estimated that about 80 man-months of foreign expatriates will be required to assist the executing agency for this study. The experts for this study as follows:

- (1) Project Manager
- (2) Transport Planner
- (3) Regional Planner
- (4) Transport Economist
- (5) Tourism Specialist
- (6) Traffic Engineer
- (7) Cost Estimator
- (8) Senior Highway Engineer
- (9) Highway Engineer
- (10) Structural Engineer
- (11) Soil/Material Engineer
- (12) Surveyor

##### 4.3 Time Schedule

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



## FEASIBILITY STUDY ON RAILWAY TRACK REHABILITATION\*

### 1. BACKGROUND

#### 1.1. Project Area

This project covers the mainline and branch lines in the southern part of the North Sumatra Railway. The sections to be covered by this project are illustrated in Figure 1. Total length of the railway sections is about 268 km.

#### 1.2. Project's Role

The area in the southern part of North Sumatra Province, especially the area along the coastal line, is one of the most developed areas of plantation production along with related agro-industries. There are also major concentrations of population such as Pematangsiantar, Tebingtinggi and Rantauprat in the area.

At present, principal transportation means here are the railway and the road centered around the city of Medan and the port of Belawan. The Belawan port is ranked among the major ports of Indonesia along with Tanjung Priok, Surabaya in Java and Ujung Pandang in Sulawesi.

The existing railway system is far from satisfactory, with outdated facility and poor maintenance work which have resulted in frequent delay, low quality service and lack of competitiveness with road transportation. Nonetheless, the role of this railway system is extremely important in efficiently transporting products made in the area, chiefly plantation products. Efficient transportation would in turn give incentives for further development of the area.

### 2. THE PROJECT

The project aims at an overall upgrading of the railway system, while focusing on the rehabilitation of the track. The project consists of the following elements:

#### (1) Reinforcement of track and rail

Upgrading measures to meet the traffic volume and axle weight on each railway section, including the appropriate type of rail/sleeper and ballast depth, are to be recommended.

#### (2) Improvement of rolling stock

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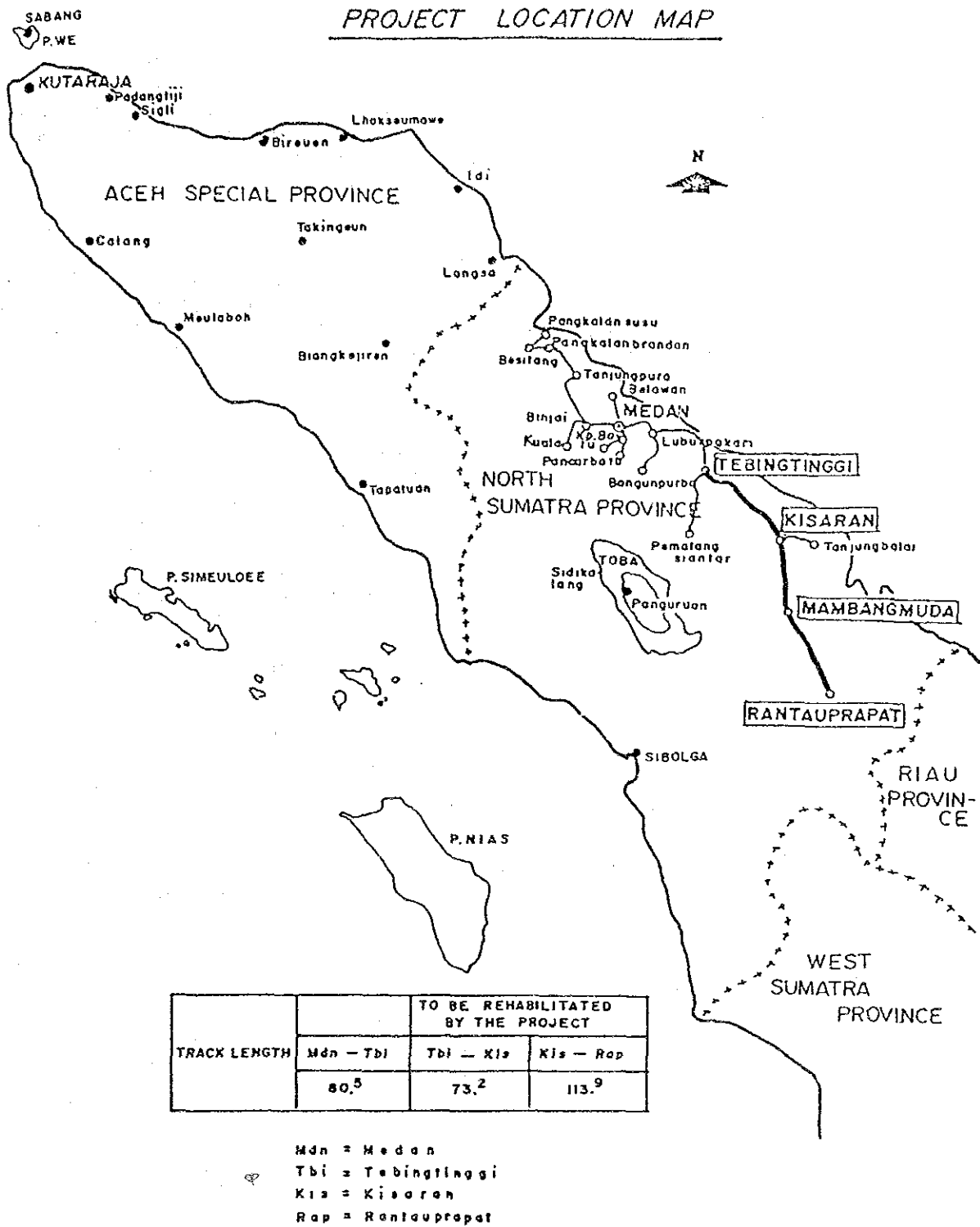


Figure 1. Project Location Map

Measures to reduce car defects/disorders including replacing accident-prone old cars with new ones, improving maintenance facilities/skills, providing spare parts, etc. are to be studied and recommended. Possibility of introducing cars capable of operating on different gauges of railway should also be studied.

### (3) Containerization

With container handling at the port of Belawan increasing, possibility of introducing more container cars as well as of establishing container terminals at key stations is to be studied.

### (4) Passenger service

As prospects are bright for future urbanization in the area, techno-economic feasibility of passenger transportation especially within the Medan metropolitan area is to be studied. In this regard, upgrading measures of track capacity and train operation safety by means of improving signalling, station track layout, etc. are to be examined.

## 3. OBJECTIVE OF THE STUDY

The objective of this study is to formulate a railway vitalization plan for the realization of efficient transportation systems in the area. In spite of the great functional potential, the railway system has the following problems with it. Formulation of a railway improvement plan seems urgently needed:

- Rails, tracks and accompanying systems are obsolete. Most of them were constructed about 80 years ago, and good maintenance works have been lacking since then. This has resulted in an inefficient railway operation which is unable to catch up with the increasing demand for land transportation.
- Rolling stock has not been well maintained. As most of the rolling stock are not well maintained, malfunction of them as well as accidents are frequent to such an extent that the system loses reliability.
- Passengers are decreasing. In recent years more and more passengers use road transportation, such as bus, due to the better service and cheaper fare.

One of the main products to be transported by this railway would be palm oil produced in the estates along the line. Since the Government has a plan to ship all palm oil produced on the east coast of Sumatra to Batam (either through Belawan or Dumai in this case), it is important to conduct a comparative study which compares this project with the establishment of a new transportation system extending to Dumai.

## 4. SCOPE OF WORK

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

- (1) To overhaul the current functions of the railway
- (2) To establish future economic framework of the Region

- (3) To forecast transportation demand and revenue, including analysis about the optimum levels of fares.
- (4) To formulate a future train operation plan
- (5) To identify the items of rehabilitation and improvement including cars.
- (6) To prepare preliminary design of railway rehabilitation/upgrading
- (7) To estimate cost
- (8) 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 Railways are responsible for the execution of the study and implementation of the work thereafter.

### 5.2. Expertise and Man-Months

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

1. Team leader/Railway planner
2. Transportation planner
3. Track and structure engineer
4. Train operation specialist/Management expert
5. Cost estimator
6. Economist/Financial analyst
7. Signalling and telecommunication engineer
8. Rolling stock engineer

About 70 man-months will be required in total.

### 5.3. Time Schedule

The duration of the study will be 12 months.



## STUDY ON LAKE TOBA AND THE VICINITY TOURISM DEVELOPMENT\*

### 1. BACKGROUND

#### 1.1. The Area

Lake Toba and the vicinity consist of the following areas:

- Parapat and vicinity resorts
- Central Samosir resort
- North Samosir resort
- Tongging resort
- South Toba resort
- East Toba resort

#### 1.2. Project's Role

The fifth Five Year Development Plan attaches high priority to the tourism development in Indonesia. Tourism is a potential aspect of regional development plannings. Main objectives of the tourism development in Indonesia have special characteristics; namely, to increase employment opportunities, to stimulate rural economic development particularly in the remote areas, to introduce the available natural and cultural attractiveness to the world as well as to increase foreign exchange earnings.

North Sumatra is ranked as the third biggest tourist destination in Indonesia following Bali and Central Java. This province has a great potential in natural as well as cultural tourism objects such as cultural heritages of Batak and Nias. In particular, Lake Toba and the vicinity is the area with the greatest tourism potential among other areas in North Sumatra. The potentialities are shown in the nature and the size of Lake Toba accompanied by the panoramic beauty, cool climate and its unique culture.

During the last 10 years, the number of visitors to Lake Toba and the vicinity as well as the province as a whole has been rapidly increased. However, simultaneously spontaneous developments by private sectors have been sprawled disorderly in the area. Furthermore, it is worried about that industrial developments and a growth of local human settlements in the area will bring about undesirable impacts on the tourism potentials as well as the natural conditions. Therefore, it is not only desirable but also quite urgent to guide tourism developments in the area properly, to promote the local economy and give positive impacts toward development in other sectors, and to take necessary actions for the environment conservation.

The expected role of the project is as follows:

- to function as planning guidelines for tourism development in the area in the future, to put the developments into order and

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- to meet the people's needs by providing tourism facilities properly
- to preserve nature of the area which is one of the major destinations representing the natural beauty and Indonesian culture
- to stimulate the tourism industry and other tourism-related economic activities in the long term
- to utilize tourism potentials in the area as much as possible responding to the market's needs

## 2. OBJECTIVES OF THE STUDY

Objectives of the project are to draw a tourism development site plan of this area and provide necessary recommendations for its implementation including identification of tourism related and supporting infrastructure developments, in particular, roads and urban infrastructure in Parapat, and to conduct feasibility studies for the projects

## 3. SCOPE OF WORK

### 3.1. General

The study will include, 1) marketing analysis in the tourism in the area, 2) preparation of a site plan and 3) conduction of feasibility studies on infrastructure developments.

### 3.2. Major Items to Be Studied

#### (1) Marketing Analysis on the Tourism in the Area

The study will assess tourism potentials in the area in terms of marketability and identify market's needs accurately. The major market consists of the following six sub-markets:

- 1) neighboring countries (Singapore and Malaysia)
- 2) Japan
- 3) Australia and New Zealand
- 4) European Countries (Netherlands, West Germany, France, UK, and Italy)
- 5) U.S.A.
- 6) domestic

The marketing analysis should utilize data collected by the Directorate General of Tourism,; data from Puslitbang (Research and Development Center), BPS(Central Bureau of Statistics), embassies, study will identify the market's potentials and needs which will be taken account into the site planning in the next step.

#### (2) Preparation of a Site Plan

The site planning will cover the following items:



- reviewing of the previous reports and relevant projects including the North and West Sumatra Tourism Study by JICA in 1978
- spatial planning for the entire area and land use planning for the selected areas with high development potentials
- planning of road network in the area such as Lake Toba ringroad (in particular, a link between Parapat and Brastagi) and Samosir Island ringroad
- basic design of tourism facilities
- cost estimation of construction works

### (3) Feasibility Studies on Infrastructure Development

The study will conduct feasibility studies on important and urgent infrastructure developments, in particular, the road network development and the urban infrastructure development in Parapat.

The road network consists of the following links:

- 1) Lake Toba ring road (in particular, Brastagi-Parapat)
- 2) Samosir Island ring road
- 3) Other feeder roads for the above roads

The urban infrastructure development will cover water supply, drainage and sanitation in Parapat.

## 4. EXECUTION OF THE STUDY

### 4.1. Executing Agency

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

### 4.2. Expertise and Man-Months

The study will be undertaken by a consulting team of tourism planner, tourism marketing researcher, land use planner, landscape architect, architect, civil engineer, highway engineer, utility engineer, ecologist with total 80 man-months.

### 4.3. Time Schedule

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

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## STUDY ON WETLAND FOOD CROP INTENSIFICATION AND DIVERSIFICATION\*

### 1. BACKGROUND

#### 1.1. Location

The project will be located in Kabupaten Tapanuli Selatan, North Sumatra.

#### 1.2. Project's Role

Promotion of intensive rice production has been given top priority in Indonesia during the past successive five-year national development plans. With achievement of self-sufficiency in mid-1980s, however, the sectoral policy focus is now being shifted increasingly to diversification, although the maintenance of rice self-sufficiency remains one of the major objectives of food crop production.

North Sumatra is one of the rice deficit provinces in Indonesia. Kabupaten Tapanuli Selatan is at present estimated to be self-sufficient in rice, and the on-going irrigation projects are expected to maintain the local self-sufficiency in the medium term. However, the bulk of the remaining wetland is either rainfed or irrigated by simple village systems, and cannot sustain double cropping of rice every year. Partly in line with the national objective of diversification, partly for increasing income-generating opportunities of available wetland, the project aims to raise the wetland cropping intensity in the central valley area by establishing stable cultivation of marketable secondary and horticultural crops.

### 2. THE PROJECT

The project mainly consists of five supporting activities as follows:

- (1) Development of rainfed wetland, particularly with provision of small-scale irrigation/drainage improvement
- (2) Introduction of secondary food crops (such as soybean, maize and peanut) and vegetables into the cropping pattern on wetland
- (3) Improvement of harvest and post-harvest operations and market-ing arrangements
- (4) Strengthening or establishment of a rural extension center (or centers) with appropriate equipment and facilities for demonstration and manpower training

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- (5) Introduction of appropriate mechanization to support the above components

### 3. OBJECTIVES OF THE STUDY

Prior to the implementation of the project, a study is needed to specifically formulate the project. The objectives of the study are (i) to critically analyze the existing cropping patterns on wetland, (ii) to identify effective measures to increase the wetland cropping intensity through diversification, and (iii) to suggest a range of institutional supports necessary to disseminate improved farming operations on wetland.

### 4. SCOPE OF WORK

Major items to be studied are as follows:

- Analysis of major technical and physical limitations of wetland farming, including post-harvest operations
- Identification of social and economic constraints to more intensive utilization of available wetland, such as availability of labor and draft animal or mechanical power, marketing arrangements, and access to institutional supports
- Analysis of the prospects of major markets and local processing for selected parawija (secondary) and horticultural food crops
- Suggestions on feasible measures for promoting wetland food crop intensification and diversification

### 5. EXECUTION OF THE STUDY

Executing agency is the agricultural bureau (Dinas Pertanian) with close coordination/consultation with the provincial and kabupaten BAPPEDAs.

Fields of expertise and man-months necessary are as follows.

Crop Science Specialist (Team Leader)	6	m/m
Irrigation specialist	4	m/m
Post-harvest specialist	3	m/m
Agricultural machinery specialist	3	m/m
Agricultural economist	6	m/m

Time schedule will be tentatively for 6 months.



## STUDY ON DRYLAND FARMING DEVELOPMENT\*

### 1. BACKGROUND

#### 1.1. Location

The project will be implemented in Kabupaten Tapanuli Selatan, North Sumatra.

#### 1.2. Project's Role

One of the major agricultural policies of the current five-year plan is to improve and sustain national food self-sufficiency. This policy objective consists of the consolidation of the past achievement in rice production, on the one hand, and the promotion of agricultural diversification partly to meet the growing domestic demand and partly to increase the income-earning opportunities for small farmers, on the other.

In North Sumatra Province, there are substantial disparities in terms of growth performance and per capita income between the eastern and western coastal areas. The western plains of Tapanuli Selatan is one of the sparsely populated areas of the province and contain extensive areas opened up for transmigration projects. Because of inadequate wetland development, many local as well as transmigrated farmers rely on dryland agriculture for subsistence. The proposed project is in line with the above national policy and aims to increase the income-earning opportunities of farmers by harnessing the potentials of less developed areas.

### 2. THE PROJECT

The basic activities of the project are (i) to develop effective area-specific cropping systems on dryland, (ii) to incorporate feasible soil conservation techniques and appropriate mechanization, (iii) to develop and/or introduce improved harvest and post-harvest operations, and (iv) to organize effective training/extension programs. These activities will be implemented by strengthening, and/or establishing, a rural extension center (or centers) with appropriate equipment and facilities for demonstration and manpower training.

### 3. OBJECTIVES OF THE STUDY

Prior to the implementation of the project, a study is needed to specifically formulate the project. The objectives of the study are (i) to critically analyze the existing systems of land use and cropping patterns in dominantly dryland farming areas, (ii) to identify a selective range of environmentally sustainable and economically viable alternatives of dryland farming, and (iii) to formulate an appropriate mix of major activities to be pursued at the selected center(s). The area suitable for the proposed project is in the eastern plains of

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Kabupaten Tapanuli Selatan which include transmigration areas, and has the problem of water stress in some months of the year. But there appears to be a possibility of utilizing groundwater for supplementary irrigation, and this possibility need be examined during the study.

#### 4. SCOPE OF WORK

Major items to be studied are as follows:

- Characteristics of prevailing land use and land tenure systems of dryland by major edaphic classification
- Technical and economic evaluation of the existing production, harvest and post-harvest operations on dryland
- Preliminary assessment of soil capability and groundwater resources and suggestions on suitable crops, cropping patterns and soil conservation techniques
- Analysis of the present marketing arrangements and the prospects of major markets and of local processing
- Available institutional supports and their limitations

#### 5. EXECUTION OF THE STUDY

The executing agency is the agricultural bureau (Dinas Pertanian) in close coordination with the provincial and kabupaten BAPPEDAs.

Fields of expertise and man-months are tentatively as follows:

Agronomist (Team Leader)	8 m/m
Agricultural economist	8 m/m
Groundwater specialist	4 m/m
Agricultural machinery specialist	4 m/m
Dryland farming specialist	8 m/m

Time schedule will be tentatively for 8 months.



## STUDY ON LIVESTOCK DEVELOPMENT\*

### 1. BACKGROUND

#### 1.1. Location

The project will be established in Kabupaten Tapanuli Selatan, North Sumatra Province.

#### 1.2. Project's Role

One of the major agricultural policies of the current five-year plan is to sustain and/or improve national food self-sufficiency in a broad sense. With regard to rice production, Indonesia has been remarkably successful in achieving self-sufficiency, but for livestock and secondary food crops, a great deal still remains to be done for the provision of effective institutional supports in order to strengthen the national and regional capacity of supplying to the growing domestic market.

In view of the national objective of raising the level of per capita consumption of animal protein and the growing demand for meat in urban centers in and outside the province, the extensive grassland available in Tapanuli Selatan can be utilized for raising cattle for meat production. This will contribute to the diversification of income-generating opportunities for farmers in the under-developed west coast area of the province.

### 2. THE PROJECT

The basic activities of the project are (i) to improve natural pasture management for rotational grazing, possibly in combination with silvicultural development for conserving top soils and vegetation, (ii) to develop improved systems of livestock management, with emphasis on animal nutrition and disease control, and (iii) to organize effective training programs and extension services. These activities can be implemented by strengthening a rural livestock extension center (or centers) with appropriate equipment and facilities for demonstration and manpower training. A possibility exists to establish a model cattle ranch in the western plains of Tapanuli Selatan which will serve to disseminate improved cattle and pasture management for interested farmers' groups and private investors.

### 3. OBJECTIVES OF THE STUDY

Prior to the implementation of the project, a study is needed to specifically formulate the project. The objectives of the study are (i) to critically analyze the existing practices of animal husbandry, (ii) to identify locally suitable measures for improving livestock and grassland management, and (ii) to suggest appropriate institutional

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supports (training and extension programs), including the major components and the scale of a model ranch.

#### 4. SCOPE OF WORK

Major items to be studied are as follows:

- Analysis of the existing animal husbandry practices, and assess-ment of technical and socio-economic constraints for introducing improved livestock and natural pasture management
- Identification of suitable areas for grassland improvement and/or silvi-pasture development
- Suggestions on suitable breeds and grazing operations, training and extension programs on animal nutrition, animal health, forage crops, and the required facilities and equipment for a model ranch

#### 5. EXECUTION OF THE STUDY

The executing agency is the livestock bureau (Dinas Peternakan) in close coordination/consultation with the provincial and kabupaten BAPPEDAs.

Fields of expertise and man-months are tentatively set as follows:

Animal husbandry specialist (Team leader)	8	m/m
Animal health specialist	4	m/m
Grassland improvement specialist	4	m/m
Agricultural economist	8	m/m
Construction engineer	5	m/m

Time schedule is tentatively set for 8 months.



## STUDY ON SMALLHOLDER COCONUT DEVELOPMENT\*

### 1. BACKGROUND

#### 1.1. Location

The project will be implemented in Southern Tapanuli, North Sumatra Province.

#### 1.2. Project's Role

The development policy for the current five-year plan emphasizes the importance of self-sufficiency in food in a broad sense, increases in income among the rural poor, and correction of regional imbalances in growth.

In North Sumatra Province, there are sizable disparities in growth performance and per capita income between the eastern and western coastal areas. The proposed project is in line with the above national policy, by introducing intensive coconut-based dryland farming for smallholders in the area around transmigration sites.

The project aims (i) to improve the production of coconut mainly for domestic consumption (as food and edible oil), (ii) to increase the income of farmers in less developed areas, and thereby (iii) to contribute to the narrowing of regional disparities.

### 2. OBJECTIVES OF THE STUDY

Prior to the implementation of the project, a study is needed to specifically formulate the project. The objectives of the study are (i) to select suitable locations, along the west coastal areas, for establishing coconut groves in more or less contiguous units totalling about 3,000 ha, and (ii) to evaluate the economic and financial feasibility of such development.

### 3. SCOPE OF WORK

In Indonesia, a variety of programs have been, and are being, implemented for smallholder growers of estate crops, such as PIR programs, project management units, partial programs and self-reliant (swadaya) programs, to name only major standardized programs. However, some of these programs appear to have mixed results, depending on such factors as crops and locations selected for program operation. In view of the special characteristics of Nias Islands, the study is expected to evaluate the relative merits of alternative programs as well.

Major items to be studied are as follows:

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- (1) Analysis of the present status of smallholder coconut production
  - Technical aspects (soil capability, suitable planting materials, operation and maintenance, harvest and post-harvest practices, etc.)
  - Socio-economic aspects (land use, size of holding, organization of work force, production costs and income)
  - Available institutional supports
- (2) Analysis of local marketing system and bottlenecks, and market prospects
- (3) Project formulation
  - Identification of basic components for appropriate technology packaging
  - Comparative analysis of alternative programs
  - Identification of the appropriate management system and technical assistance requirements

#### 4. EXECUTION OF THE STUDY

The executing agency is the estate crop bureau (Dinas Perkebunan) in close consultation/coordination with the provincial and regency BAPPEDAs.

Fields of expertise and man-months are tentatively as follows:

Agronomist (Team leader)	6 m/m
Pest control specialist	4 m/m
Post-harvest technology specialist	4 m/m
Economist	4 m/m

Time schedule is tentatively set for 6 months.



## CONSULTING SERVICES FOR SMALLHOLDER COFFEE

### DEVELOPMENT\*

#### 1. BACKGROUND

Coffee is one of the export-oriented agricultural commodities in Indonesia, and the planted area in North Sumatra Province totalled about 46,000 ha with the production of 32,000 tons in 1986. Indonesia has a long history of coffee production and is the third largest coffee producers in the world. The crop is almost exclusively grown by smallholders, sometimes in remote areas. Not only cultural practices but also harvesting/processing techniques still remain largely traditional. In many cases, replanting of old unproductive trees are urgently necessary.

In order to improve the quality of coffee beans and increase the income of small coffee growers, it is necessary to provide technical assistance for farm management, processing, and marketing. The most appropriate sites or candidate sites will be identified later, somewhere in Kabupatens Tapanuli Selatan, Tapanuli Utara or both.

#### 2. PROPOSED PROGRAM

The program aims to improve the quality of arabica coffee beans in mountainous areas with the elevation 1,000m from the sea level, where high quality coffee can be grown, especially around Muarosipongi well-known for its Sumatra Mandelin coffee. Shorter sun-shine hours, higher relative humidity and lower temperature ensure the production of quality coffee beans with a longer maturation period, of 8 months or more. In the case of replanting and rehabilitation of the existing coffee farms, suitable working efficiency and planting density must be taken into consideration.

#### 3. NEEDS FOR TECHNICAL COOPERATION

The present technical extension services seems not very functional, and smallholders are far behind the minimum requirement of available technical information. There is a need to establish effective extension programs with the participation of the expatriate specialists.

#### 4. SCOPE OF WORK

Resident experts are assigned in the selected program area(s) and work together with smallholders in major coffee growing areas. Farm management and marketing would be the immediate objectives of technical services.

Major activities to be implemented are as follows.

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- to improve the management of coffee farms, such as replanting, rehabilitation, spacing, trimming, harvesting, processing and merchandizing;
- to clarify socio-economic aspects of coffee growing, and introduce appropriate measures for environmental conservation on arable land in coffee growing areas;
- to strengthen the cooperatives or farmers' organizations in order to increase the income from coffee growing

#### 5. EXECUTION OF TECHNICAL COOPERATION

Executing agency will be local KUDs in close cooperation and coordination with the estate crop bureau and the provincial and regency BAPPEDAs.

Fields of expertise and man/months required for five year technical cooperation services are as follows:

Agronomist (tree crop specialist)	60 m/m
Food processing specialist	30 m/m
Marketing specialist	30 m/m