B. West Aceh Integrated Development Program

1. Background

280. The western coastal areas in Aceh have long been hindered from development mainly from the reason that these areas are located out of Malacca economic-sphere and lack of transportation system. The above fact resulted in disparities in income and standard of provided socio-economic infrastructure among the areas within the province of Aceh. But these regions, especially for the Kabupaten of Aceh Barat, are endowed with rich natural resources such as water and fertile lands, and seem to have vast potential for the over-all economic development of the region. It might be no exaggeration to say that the future level up of Aceh economy is up to the achievement of economic development in the western coastal area of Aceh. Most of the issues in West Aceh at present seems to come from lack of comprehensive view for the regional development of the area, and lack of proper management methods or initiatives ever taken for the area development. It should be noted that though this IDEP only covers Kabupaten Aceh Barat, the program can be extended to include Kabupaten Aceh Selatan which has some similarity with Aceh Barat.

2. Program Area

2.1. Area and Population

281. The program area for the IDEP in West Aceh is confined to the Kabupaten of Aceh Barat in which the island of Simelu and nearby islands are excluded as shown in Figure 31. The number of Kecamatans included in the program area is 14. The total area is about 8,800 square kilometers in size with population of about 270 thousand as of 1987. Population density of the area is about 30 persons per square kilometers which is far below the provincial average of about 57 in the same year. Average population increasing rate per year during last few years (1984-1987) is 3.2 per cent which a little bit higher than that of provincial average of 2.9%.

2.2. Natural Condition

282. The Area is situated along the western coast of Aceh province and is the most rainfall zone caused by the monsoon effect on the Barisan mountain range. The annual average rainfall is 3,600 mm to 3,700 mm at Meulaboh, Calang and Jeuram. There exist such major rivers as Teunom, Woyla and Tripa whose catchment area covers most of the flat area of the Area.

2.3. Economy

283. Agriculture is the mainstay of the area in which the production of rice and tree crops on a smallholder basis are major subsectors. With regard to rice production, rice production under well designed irrigation schemes such as at Jeuram and Kualabhee are on-going and contributing greatly to the enhancement of rice production, although in the most of the other parts of the area, rice plantation is conducted under rainfed. As for the estate crop, rubber, clove and copra are major products. It is one of the major characteristics that these productions are made under small holder basis. Fishery is relatively developed centered around the city of Meulaboh although fishery resources are not fully tapped yet. Forestry is one of the major industries of the area and a great amount of woods are transported from the ports of Meulaboh and Calang and by road chiefly to the areas located on the eastern coast of Aceh

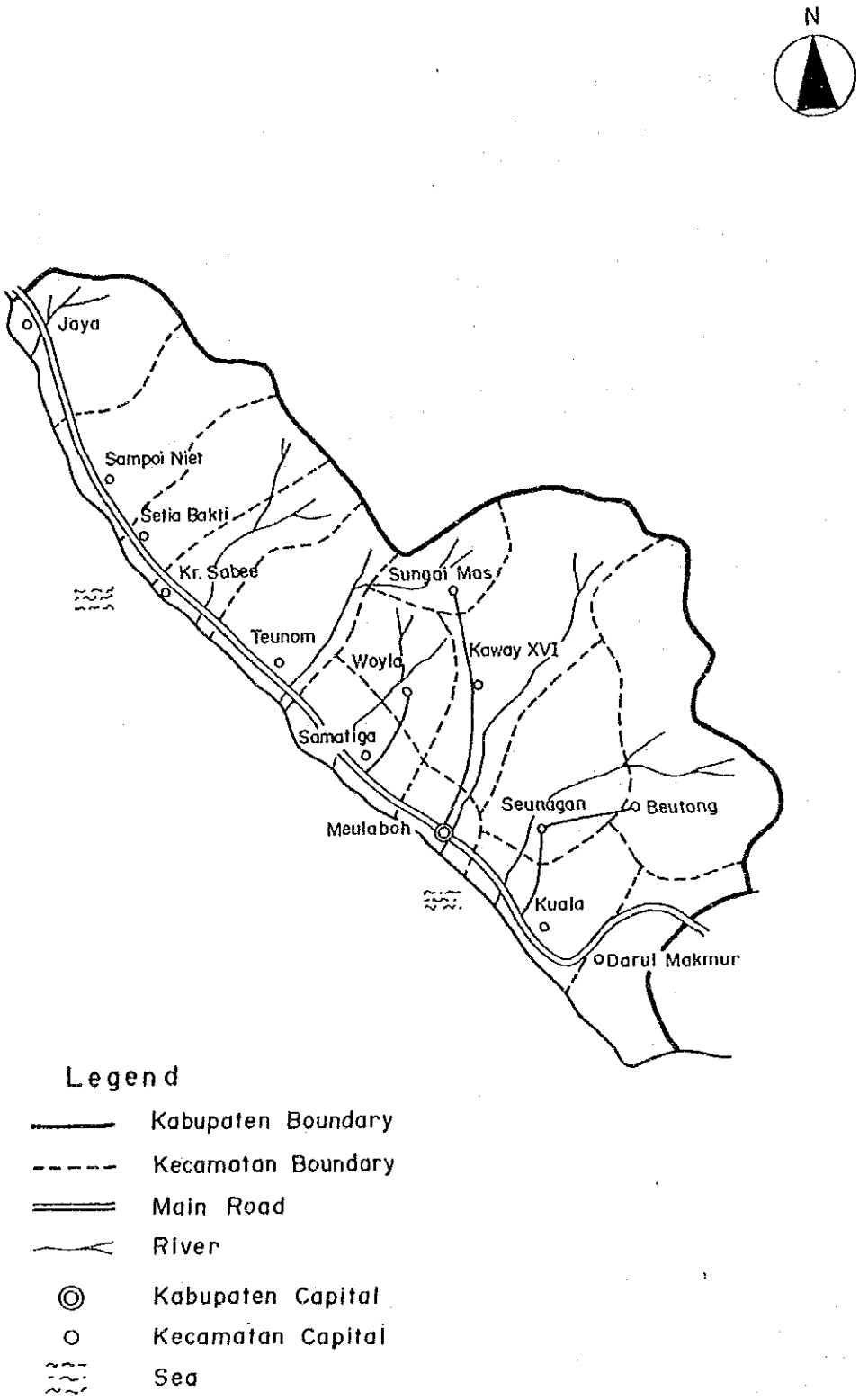
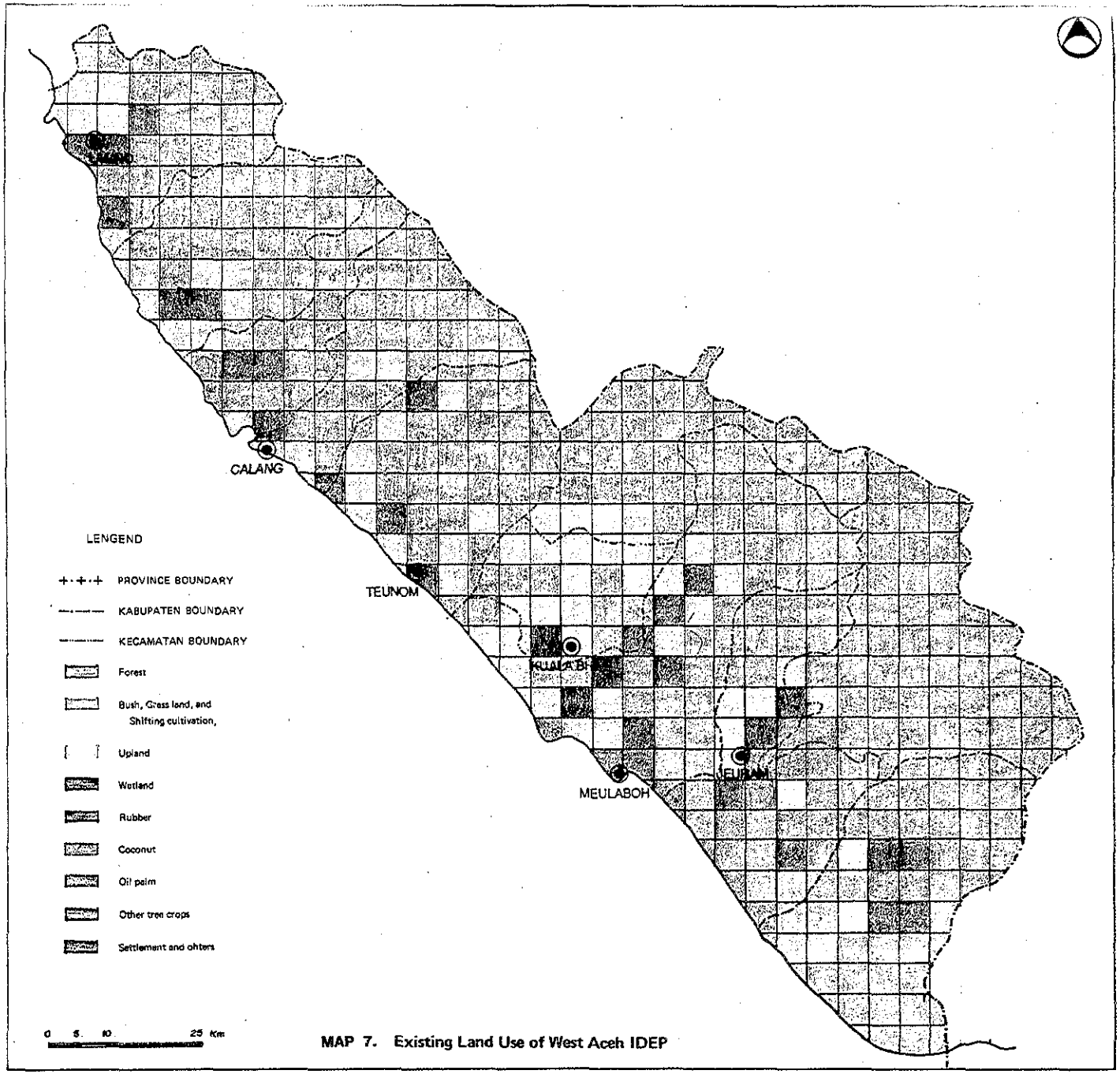


Figure 31. Program Area of West Aceh IDEP



MAP 7. Existing Land Use of West Aceh IDEP

and North Sumatra. The level of industry of the area is still low, as this area has long been specialized in raw material supplying area within the economy in Aceh and North Sumatra. Steady fastening of local manufacturings, say timber processing, fish processing and possible agro-industries are proposed in the near future. Profile of sub-regions included in the area is shown in Tables 41 and 42.

3. Development Potentials and Constraints

284. First of all, early completion of "Banda Aceh-Meulaboh Road" is a prerequisite for the promotion of the IDEP. Investment incentive will come along this road. It should be completed, as scheduled by mid-1991. Second, the area has high irrigation potential taking advantages of many rivers basins and vast flat lands. Water management seems to be one of the most vital factor for the socio-economic development of the area.

285. Among the agricultural activities, rice planting might be most suitable as the area is rich in water resources. But due to uncertain marketability and continuous low price of rice, large surplus of rice production may not be beneficial to the area. Instead, more diversified food crops (soy bean, peanut, onion, nilam, pepper) tree crops (rubber, clove, coconut, cocoa), livestock and fishery should be encouraged to generate more employment and income.

286. Agro-industries including post-harvest technologies should be developed keeping pace with agricultural development. Promotion of agro-industry based on cheap and affluent production of agricultural sector there would certainly contribute to the income increase.

287. Transportation system such as roads and port are important not only for the shipment of increased agricultural products but also from the view point of civil minimum people should enjoy.

288. Unemployment is another issue the area has agricultural diversification under well designed water management, as well as public undertakings of infrastructure construction, would contribute to the enhancement of employment level.

289. Subject to comparative study between hydro power and thermal power based on coal to be produced in the area, hydro power plants, including mini hydro power plant, may be constructed at suitable places. If the quality of the coal is proved to be above standard, level up of life standard which co-existing with traditional life style, utilizing this energy resources, should be pursued.

4. Development Goals and Strategies

290. Ultimate development goals for this IDEP is to enhance the economic level in which better living standard for the local people is satisfied. As a initiative to attain the goal, agricultural and infrastructual development in the area may maneuver dominant roles.

291. First of all, a comprehensive agricultural study for the IDEP is recommended to identify the most suitable agricultural commodities and quantities to be produced, together with their marketing possibilities. It may take one year or more, but should be completed before the Banda Aceh Meulaboh Road, which is very crucial for the implementation of the IDEP, is completed. Based on the outcome of the study, necessary infrastructures, such as roads, port, irrigation and power generation, may be effectively planned and

Table 41 Area, Population and Population Density

Kecamatan	Capital	Area (km^2)	Population	Population Density (Persons/km^2)
Beutong	Ulee Jalan	1,263	8,746	6.9
Darul Makmur	Alue Bilie	572	26,991	47.2
Jaya	Lam No	620	18,817	30.3
Johan Pahlawan	Meulaboh	101	28,907	288.2
Kawai XVI	Keude Aron	745	35,600	47.8
Krueng Sabee	Calang	521	9,406	18.1
Kuala	Ujang Patihah	592	34,534	58.3
Sama Tiga	Suwak Timah	396	24,952	63.0
Sampoi Niet	Ihok Krut	928	9,099	9.8
Setia Bakti	Lageun	629	5,168	8.2
Seunagan	Jeuram	888	28,488	32.1
Sungai Mas	Kajeung	486	3,005	6.2
Teunom	Teunom	807	16,630	20.6
Woyla	Kuala Bhee	264	15,970	60.5
Total	------	8,812	266,313	30.2

Source: Aceh Barat Dalam Angka, 1987.

Table 42. Characteristics of Land Use (1982/83)

(unit: ha)

Kecamatan	Wetland	Dryland (Annual Crops)	Large Estates	Small-holder Estates	Forest and Bush
Beutong	4,616	1,900	0	190	125,856
Darul Makmur	2,287	6,400	3,223	2,398	46,956
Jaya	--	--	--	--	--
Johan Pahlawan	1,770	0	589	3,289	59,958
Kawai XVI	8,738	0	4,413	332	83,338
Krueng Sabee	317	1,787	280	92	44,219
Kuala	2,330	2,108	3,055	1,625	20,322
Sama Tiga	1,695	335	4,755	2,868	18,232
Sampoi Niet	640	0	1,084	1,818	61,012
Setia Bakti	412	290	310	250	78,935
Seunagan	5,971	330	0	475	34,041
Sungai Mas	98	368	0	662	75,312
Teunom	15,675	973	3,597	24,992	68,162
Woyla	2,995	1,095	1,258	2,053	30,447
Total	47,544	15,586	22,564	41,044	746,790

Note: Total land use area does not tally that of Table 41 due to different source of data.
Source: Cipta Karya Data Base.

constructed. Development scheme and spatial development plan are illustrated in Figures 32 and 33.

5. Identified Projects and Phasing

292. Identified projects and possible phasing about them are listed in Table 43.

Table 43. West Aceh IDEP Project List

P-2	West Aceh																
Code	Project	REPELITA V					REPELITA VI					REPELITA VII & VIII	High	GFS	Pub Inv Rep. V
		89	90	91	92	93	94	95	96	97	98	1999 - 2008	Priority		(US$M)
	I. Productive Sectors														
A- 6	Wetland Food Crop Diversif. and Intensif.		-	++	++	++	++	++	++	++	++		0	0	0.7
A- 7	Paddy Post-Harvest Technology Development						--	++	++	++	++				
A-10	Smallholder Coconut Development						-+	++	++	++					
A-11	Smallholder Rubber Development	-	++	++	++	++	+					++++++++++	0		8.0
A-13	Nucleus Estate and Smallholder Development						--	--	++	++	++	++			
A-14	Brackish Water Aquaculture Development						--	++	++	++					
A-16	Small-Scale Fishery Development				-+	++							0	0	14.3
C- 3	Meulaboh Coal Resources Development			-	--	--	++	++	++	++			0		0.5
D- 4	Dev. of Marketable Handicraft Products		-	+	++	+							0	0*	0.4
D-26	Agro-Industries			-	++	++	++	++					0	0*	
D-28	Fishery/Aquaculture-Related Industries							-+	++						
D-30	Mineral Processing Industries							--	++	++					
D-31	Craft Industries				--	++	++								
D-37	Light Engineering Industries		-	++	++	++	++						0		
	II. Infrastructural Sectors														
B- 8	Seunagen Basin Overall Development ##				--	--	++	++	++	++	++		0	0	2.0
B- 9	Jeuram Irrigation (Rehabilitation)#	++	++	++	++										
B-27	Lho' Guci Irrigation##				--	--	++	++	++	++	++		0	0	1.6
B-28	Kr. Tripa Irrigation##				--	--	++	++	++	++	++		0	0	1.6
D- 7	Industrial Estate/Area (Meulaboh)								--	++	++				
E- 1	Fuel Efficient Stove Dissemination				--	--	++	++	++	++	++	++++++	0	0*	0.7
E- 2	Rural Electrification	++	++	++	++	++	++	++	++	++	++	++++++++++++	0	0*	5.0
E-12	Teunom-1 Hydropower				--	--	++	++	++	++	++		0	0	0.5
E-14	Coal-Fired Thermal Plant							--	--	++	++	++			
F- 4	Bridge Replacement Program		--	++	++	++							0	0*	19.0
F- 5	Banda Aceh-Meulaboh Road Betterment		+	++	++								0	0	13.0
F- 9	Lhokseumawe- Tekengon-Meulaboh E-W Road				--	--	++	++	++	++	++				
F-11	Aceh Collector Road Betterment			++	++	+							0		16.0
F-15	Aceh West Coast Port Development			-	--	-	+	++	++	+			0	0	1.0
F-18	Simeulu Island Port Development				-	-	++	++	+						
F-19	Inland Waterway Development on Woyla River							--	++	++	++				
F-21	Meulaboh Airport Development						--	++	++	+					
G- 4	Introduction of Rural Telecommunications				--	--	++	++	++				0	0*	1.7
G- 7	Kabupaten Local Telephone Network Expansion											++++++++			
G- 9	TDMA Satellite Link Expansion								++	++	++	+++			
G-11	100 Small Earth Stations Provision											++++++++			
G-13	Coin Telephone Sets Provision											++++++++			
J- 1	Urban and Rural Water Supply Program I	-	--	-	++	++	++						0		17.0
K- 3	Secondary Cities Urban Development	-	--	++	++	++	++	++					0		10.0
K- 6	Urban Road Improvement Program						--	-+	++	++					
	III. Others														
L- 2	Rural Technology Extension Program	-	--	++	++	++	++	++	++	++	++	++++			
L- 3	Home Technology Extension Program						-	--	++	++	++	++++++++++++			
L- 5	ADP for Aceh Barat (and Aceh Selatan)						-	--	-+	++	++	++++++++++++			
P-12	Production and Marketing Study		--										0	0*	1.0
														Total	114.0

Notes: 1. ---- denotes "study," ++++ "implementation."
2. On-going projects are excluded from the list except B-9 (#) which is under implementation.
3. "GFS" stands for Guideline for Study. An asterisk (*) indicates that this Guideline for Study is common to several IDEPs.
4. ## GFS integrated in the Irrigated Agriculture Development Project.
5. Public investment is for Repelita V. The figures are subject to further study.

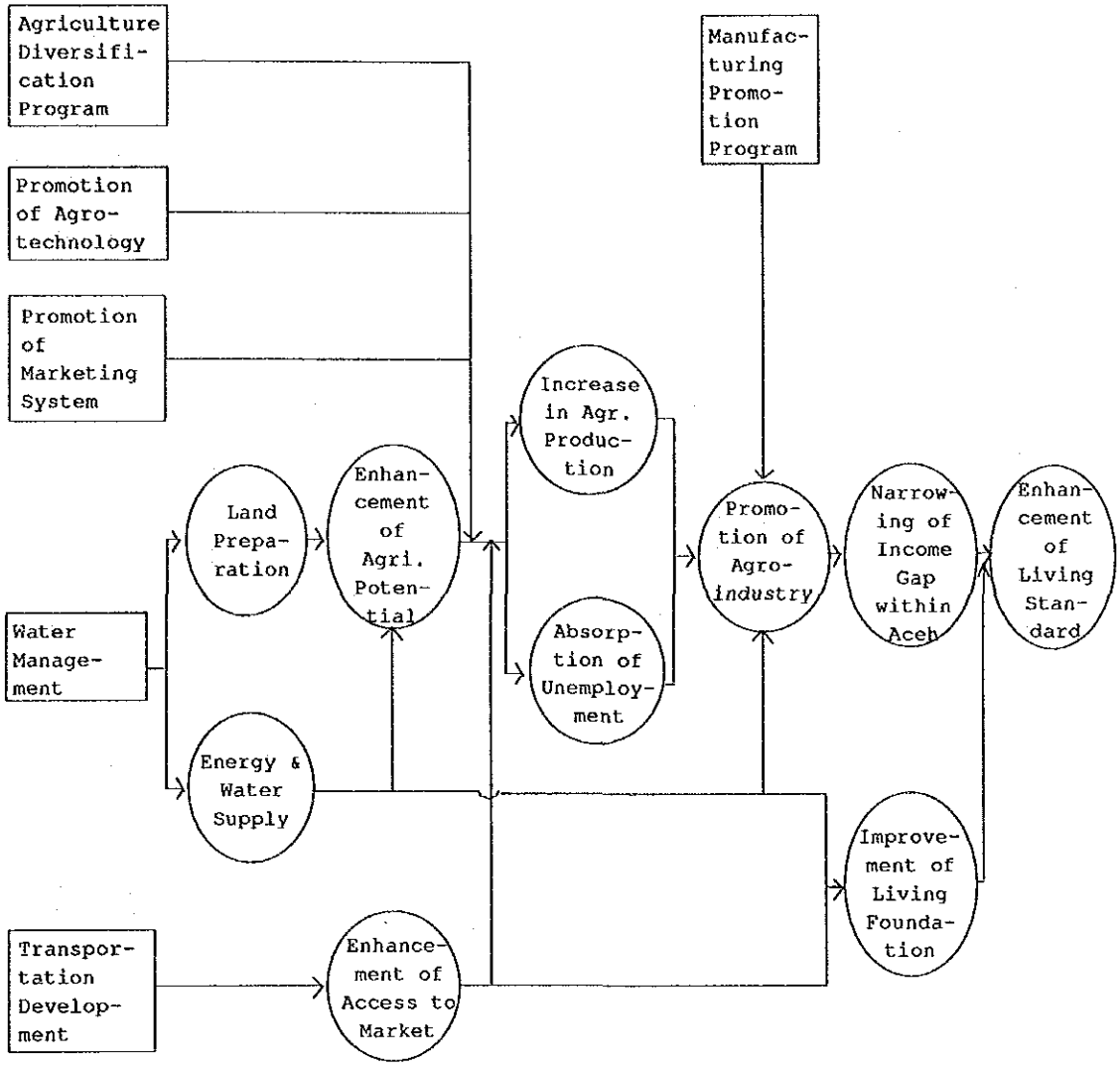


Figure 32. West Aceh IDEP Development Scheme

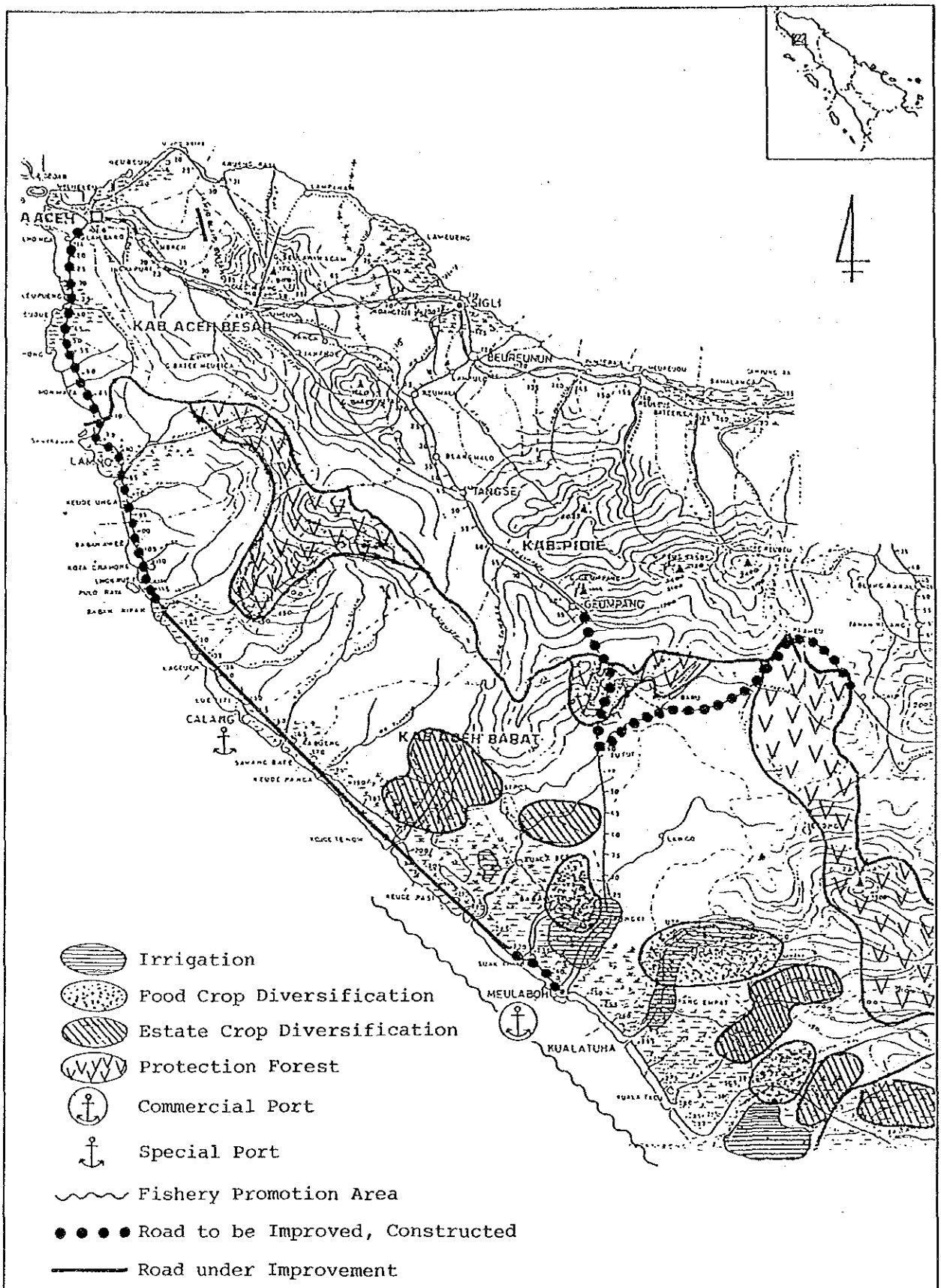


Figure 33. West Aceh IDEP Spatial Development Scheme

C. Metropolitan Medan Integrated Development Program

1. Aims

293. To strengthen Medan's functions as the primary urban center of the Region and stimulate development in surrounding areas by promoting a comprehensive, well-integrated and concerted development of the city of Medan and its environs. With regard to Medan, efforts will be centered particularly on manufacturing industry and tourism, thereby exploiting the city's most salient potentials.

2. Area Description

294. Medan, North Sumatra, is the largest urban center in Northern Sumatra with a population of 1.8 million. North to Medan is the port of Belawan, the largest in Sumatra, and the area in between along the artery has seen a growing concentration of factories in such industries as food processing, metal fabricating and wood processing. Industrial establishments are also spreading over areas west and east of Medan. There are, however, a few factors preventing Medan from stronger industrialization: electric power, water supply both for industrial and domestic uses and telecommunication services. Shortage in electricity is an urgent problem to be solved while creation of a reliable and efficient water supply system poses a long-term but imminent task to be undertaken.

295. Further outside Medan spreads a vast alluvial plain suitable for food crops and tree crops alike. To the south of Medan across a range of mountains lie Karo Highlands, where cool climate and volcanic soils combine to create an ideal place for vegetables and fruits. Some of the produce has been exported to Singapore and Malaysia airborne, but as competition from other countries got tight, problems with packaging and marketing have become evident. The southern patch of Karo Highlands around Sidikalang is a major producer of coffee and cabbage, one of the most favored vegetables in Indonesia.

296. Lake Toba is already an international tourism spot. Its gateway is Medan which has the Polonia international airport and the port of Belawan, where regular ferry services are available to and from Penang, Malaysia. Two major resorts near and on the lake, Brastagi and Prapat, have yet to be connected with a good road running through a very scenic zone along the lake side. Because of this missing link, it is currently almost impossible for tourists to take a circular route starting from Medan to Brastagi to Prapat and finally back to Medan. An improvement of this road section would greatly enhance the attractiveness of the Lake Toba area. Also needed are upgrading of the ring road around the lake and construction of roads on Samosir Island, both for tourism and regional development purposes.

297. Medan Urban Development Project (MUDP), currently under way with a financial backing from ADB, aims at improvement of urban infrastructure in the city. IDEP, therefore, takes MUDP as given and, closely monitoring the project's progress, deals only with those components which are not covered by MUDP in a wider regional perspective. Examples include basin-wide water resources development (flood control as well as water supply), roads and railways network and telecommunications.

298. Potentials for future development are summarized as follows. Agricultural extension has little possibility left in this area. Rehabilitation of existing plantations and irrigation of rainfed rice fields therefore represent two principal tasks. Vegetable production in

Karo Highlands can expand its market, both domestic and overseas, if quality of produce is improved and maintained. Expansive force of industry is somewhat suppressed by lack of adequate infrastructure. Nonetheless, as the increasing number of newly established industries indicates, thrust of industrial growth is potentially strong. What should be realized are an expansion of the industrial estate and the construction of new ones, supplemented with sufficient and stable power and water supply (for industrial and domestic use).

299. With industry expanding, careful attention is due to environmental aspects. The proposed Watershed Management Technology Center at Pematangsiantar will guide planning in this respect. Tourism has bright prospects if better access from Medan to Lake Toba is provided to tourists, sufficient accommodations are available with good quality of service, and general urban infrastructure is improved in Medan. Similarly to industry, conservation of environment is a crucial component of this development since the main tourism object here is a lake, very subject to subtle environmental changes.

3. Phasing

300. Repelita V:

(i) The most urgent are power supply projects and water resources projects since electricity and water are the two factors severely restricting industrial and urban development in Medan.

(ii) An expansion of the Medan Industrial Estate and the new establishment of an industrial estate/area in Tebingtinggi and Pematangsiantar must be given the go-ahead to facilitate establishing new factories in the Medan Metropolitan area.

(iii) For tourism promotion, improvement of the Brastagi - Prapat road section receives the top priority. This is to be supplemented by overall upgrading of urban and service infrastructure (like tourism management, information) in Medan. Possibility of expansion or relocation of the Medan airport is considered if passenger growth is rapid.

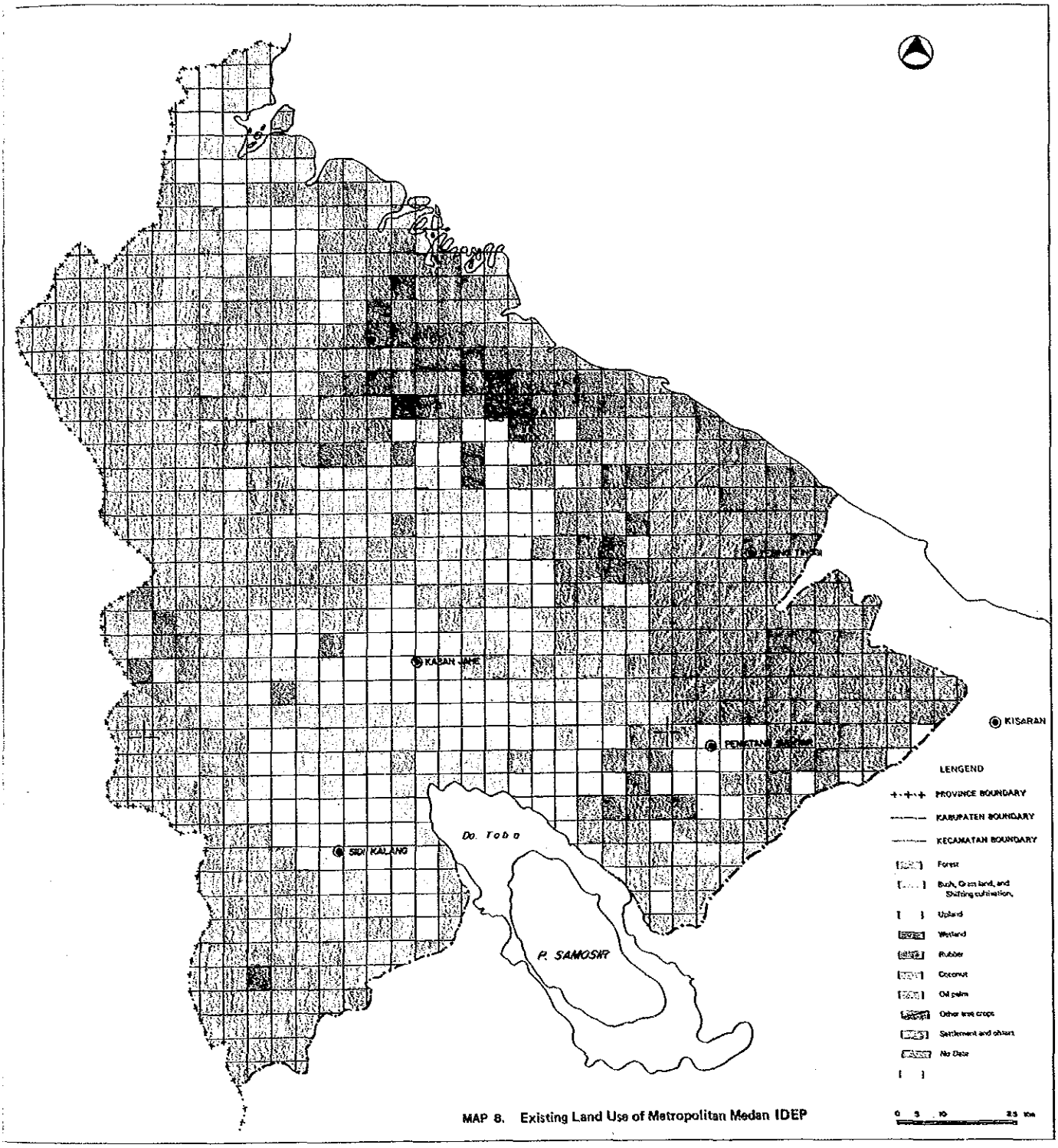
(iv) Agricultural production in this area is comparatively more advanced. Nonetheless, crop diversification and post-harvest and packaging technology development are primarily pursued to generate more income to farmers. As a diversification drive, pig and chicken breading, production and dissemination of palawija seeds, among other things, are newly introduced.

(v) Infrastructure within the city of Medan is mostly taken care of by MUDP. Hence, IDEP focuses on such projects as have regional perspective and strengthen Medan's functions as the primary regional center. Power supply, water supply, telephone services and road connection with suburban cities (e.g., Medan - Binjai toll road) are among the high-priority components. Improvement of urban infrastructure in secondary cities in the area is also initiated in this period (Kabanjahe, Sidikalang, Pematangsiantar, Binjai, Tebingtinggi, etc.).

301. Repelita VI:

(vi) Agricultural modernization started in Repelita V will continue.

(vii) Further expansion of existing industrial estates/areas and/or establishing new ones could be considered.



MAP 8. Existing Land Use of Metropolitan Medan IDEP

(viii) Expansion of Belawan port gets under way. Road systems connecting Medan to major urban centers in the area and further down to major urban centers in adjacent areas are upgraded to provide better access to Medan thereby reinforcing Medan's characteristics as the primary center of the Region.

302. Repelita VII and After:

(ix) The directions set in the previous two periods hold, with stress put on industrial development in Medan and agricultural development in Karo Highlands. Betterment of urban infrastructure in secondary cities continues while long-term projects are further pushed to their completion. New projects are selected on the basis of the results and progress made in the preceding period.

Table 44. Metropolitan Medan IDEP Project List

P-3	Metropolitan Medan															
Code	Project	REPELITA V					REPELITA VI					REPELITA VII & VIII	High	GFS	Pub Inv Rep. V
		89	90	91	92	93	94	95	96	97	98	1999 - 2008	Priority		(US$M)
	I. Productive Sectors														
A- 5	Study of Brackish Water Aquaculture Sites		--	-											
A-19	Wetland Food Crop Intensif. and Diversif.		-	++	++										
A-22	Higher-Altitude Horticulture Development			--	++	++	++						0		2.0
A-23	Market Infra. Dev. for Horticultural Crops						--	++	++	++					
A-25	Smallholder Pig Development	-	++	++	++	++	+								
A-26	Smallholder Coconut Development		-+	++	++	++	++								
A-30	Brackish Water Aquaculture Development				-+	++	++	++	++	++	++				
A-31	Brackish Water Aquaculture Intensification											++++++++			
A-33	Fishery Education							-	++	++	+				
A-35	Mariculture Development			--	++	++	++								
A-36	Lake Fishery Development						--	--	++	++	++	++			
D- 4	Dev. of Marketable Handicraft Products		-	+	++	+							0	0*	0.4
D-39	Agro-Industries		-	++	++	++	++						0	0*	
D-40	Rubber Products Industries		-	++	++	++							0		
D-41	Wood/Rattan Processing Industries		-	++	++	++									
D-42	Fishery/Aquaculture-Related Industries		-	++	++	++	++						0		
D-43	Livestock-Related Industries		-	++	++	++									
D-44	Mineral Processing Industries				--	++	++	++							
D-45	Craft Industries		-	++	++	++	++						0		
D-46	Plastic Products Industries						--	++	++	++					
D-47	Finished Textile Products		-	++	++	++									
D-48	Other Consumer Goods Industries		-	++	++	++									
D-49	Other Intermediate Goods Industries		-	++	++	++							0		
D-50	Light Engineering Industries		-	++	++	++	++						0		
D-51	Engineering Industries				--	++	++	++							
H-10	Rehabilitation of Critical Areas			--	--	++	++	++							
I- 6	Lake Toba and the Vicinity Tourism Dev.	-	--	++	++	++							0	0	29.0
I- 7	Forest Park Program						--	--	++	++	++				
	II. Infrastructural Sectors														
B- 3	Irrigation OMR	++	++	++	++	++	++	++	++	++	++	++++++++++++	0		10.0
B-40	Medan Water Supply				--	++	++	++							
B-41	Belawan-Padang Basin Overall Development	--	--	++	++	++	++	++	++	++	++		0		40.0
D- 7	Industrial Estate/Area (Medan)		--	++	++								0	0*	15.0
D- 7	Industrial Estate/Area (Tebingtinggi)						--	++	++					0*	
E- 2	Rural Electrification	++	++	++	++	++	++	++	++	++	++	++++++++++++	0	0*	5.0
E- 7	Tampur I Hydropower	-	--		+	++	++	++	++	++			0		100.0
E-16	Asahan No.1 and No.3 Hydropower				++	++	++	++	++	++	++	++++			
E-17	Renun-Toba Hydropower		++	++	++	++							0		200.0
E-19	Wampu Hydropower	-	--		+	++	++	++	++	++			0		50.0
E-21	Medan Gas Turbine Plant II	++	++	++									0		40.0
E-22	Gas-Fired Thermal Plant		--	--			++	++	++	++	++	++++++++++++			
E-23	Coal-Fired Thermal Plant		--	--			++	++	++	++	++	++++++++++++			
E-24	Power Grid Expansion		++	++	++	++	++	++	++	++	++		0		50.0
E-25	Natural Gas Utilization		--	++	++	++	++	++					0	0	20.0
F- 1	Arterial Road Upgrading		--	-	++	++	++						0	0*	10.0
F- 3	Sumatra East Coast Road Development		--	--	++	++	++	++					0	0*	25.0
F- 7	Tepaktuan-Sidikalang Road Betterment		++	++	+								0		20.0
F- 8	Tekengon-Sidikalang Road Betterment								++	++	++				
F-22	Medan-Binjai Toll Road Development		--	-	+	++	++						0	0	35.0
F-23	Medan-Sidikalang Road Network Development					++	++								
F-24	Lake Toba Tourism Road Development		--	++	++	++							0	0	51.0
F-29	Vitalization of North Sumatra Railway				++	++	++								
F-30	Medan-R.Prapat and Tebingtinggi-P.Siantar Track Rehabilitation		--	-	++	++							0	0	9.0
F-31	Belawan Port Expansion II					++	++	++							
F-38	Medan Airport Expansion					++	++	++							
G- 1	Medan-Banda Aceh Digital Microwave System											--+++++++++			
G- 2	Medan-Padang Digital Microwave System											--+++++++++			
G- 3	Medan-Pekanbaru Digital Microwave System											--+++++++++			
G-15	Kotamadya Local Telephone Network Expansion	++	++	++	++	++							0		80.0
G-16	Kabupaten Local Telephone Network Expansion						++	++	++	++	++				
G-17	Kabupaten Local Telephone Network Expansion											+++++++++			
G-18	Subscriber Radio System											++++++++++			
G-19	TDMA Satellite Link Expansion						--	++	++	++					
G-20	100 Small Earth Stations Provision											++++++++++			
G-21	Packet Data Communication System (SKDP)			++	++	++									
G-22	Radio Paging System Expansion									--	++	++++++			
G-23	Coin Telephone Sets Provision	++	++	++	++	++	++	++	++	++	++	++++++++++++	0		2.0
G-25	Telephone Outside Plant Maintenance Center					++	++				++	++	0	0*	1.0
G-26	Telephone Outside Plant Maintenance Center							++	++			++++			
G-27	Education and Training Center Expansion			++	++	++									
G-28	Long Term Plan for Local Telecom. Network			--	--								0	0*	1.1
J- 1	Urban and Rural Water Supply Program I	-	--	++	++	++	++	++	++	++	++	++++++++++++	0		5.0
K- 3	Secondary Cities Urban Development	-	--	++	++	++	++	++					0		10.0
K- 7	Urban Drainage and Solid Waste Program	-	--	++	++								0		10.0
K- 8	Urban Road Improvement Program						--	-+	++	++					
	III. Others														
H-11	River Cleaning Program (PROKASIH)			--	++	++	++	++					0		1.5
L- 2	Rural Technology Extension Program	-	--	++	++	++	++	++	++	++	++	++++++++++++			
L- 3	Home Technology Extension Program						-	--	++	++	++	++++++++++++			
P-12	Production and Marketing Study		--										0	0*	1.0
														Total	823.0

Notes: 1. ---- denotes "study," ++++ "implementation."
2. On-going projects are excluded from the list.
3. "GFS" stands for Guideline for Study. An asterisk (*) indicates that this Guideline for Study is common to several IDEPs.
4. Public investment is for Repelita V. The figures are subject to further study.

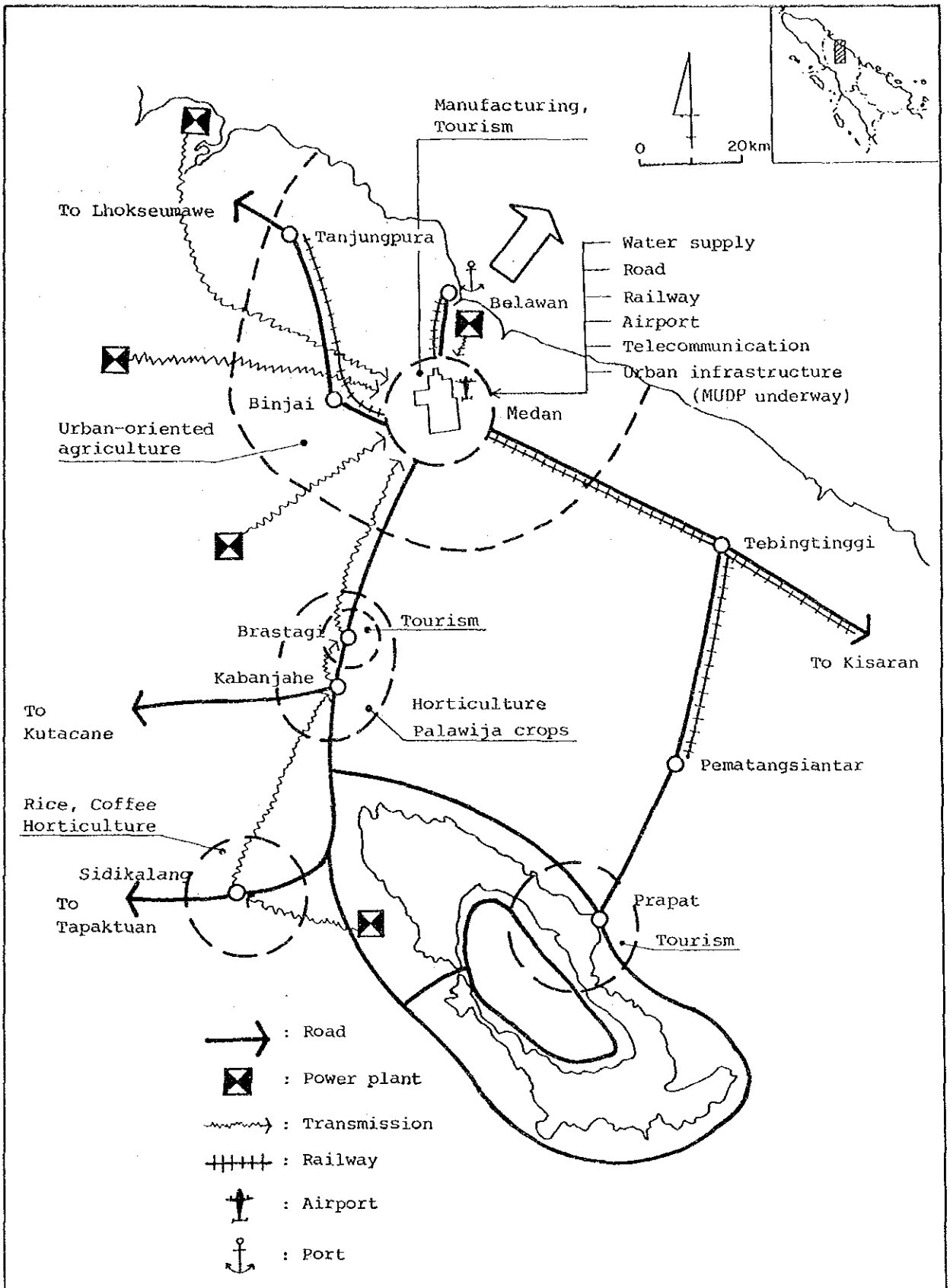


Figure 34. Metropolitan Medan IDEP Development Scheme

D. West Coast Tapanuli Integrated Development Program

1. Background

303. West Coast Tapanuli is an area which consists of two Kabupaten, Tapanuli Tengah and Tapanuli Selatan, and one Kotamadya, Sibolga. The area is relatively lagging behind the eastern part of the province in terms of economic activities, even though the area has a great deal of development potential, in particular in the agricultural sector (Tables 45 and 46).

Table 45. Per capita of GDP at Constant 1983 Market Price

(unit: Rupiah)

	1983	1984	1985
West Coast Tapanuli	284,484	295,473	303,315
Tapanuli Selatan	270,426	283,748	291,480
Tapanuli Tengah	274,894	276,965	292,081
Kodya Sibolga	492,998	503,339	493,301
North Sumatra	351,435	371,586	377,669

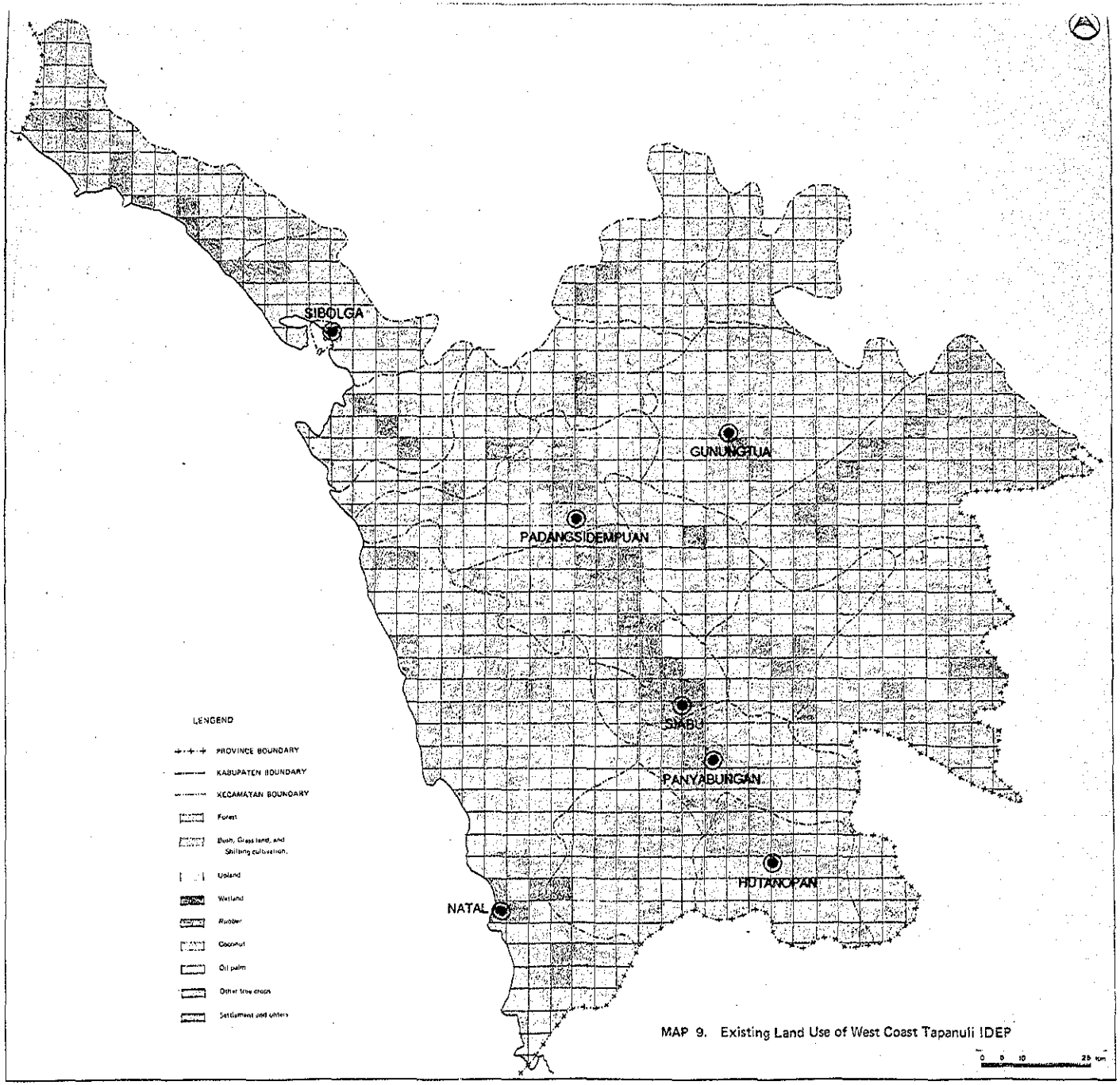
Source: Statistical Office, Province of North Sumatra

Table 46. Annual Growth Rate of GDP at Constant 1983 Market Price

	1984 (%)	1985 (%)	84/85 Average Growth Rate (%)
West Coast Tapanuli	6.06	4.73	5.40
Tapanuli Selatan	6.82	4.57	5.70
Tapanuli Tengah	2.81	7.59	5.20
Kodya Sibolga	5.91	1.61	3.76
North Sumatra	8.27	4.07	6.17

Source: Statistical Office, Province of North Sumatra.

However, the area is located at a strategic position. Namely, the area is situated at the middle part between the two major urbanized areas in the Region, Medan and Padang, and furthermore, the Trans Sumatra Highway passes through the Area. The locational advantage such as the good accessibility to the major urbanized areas should be utilized to the full extent for the development in the future.



MAP 9. Existing Land Use of West Coast Tapanuli IDEP

304. West Coast Tapanuli can be defined as a strategic hinterland which is at present relatively less developed and will decline without strong support from development activities, even though the area has a latent but high development potential. If the area is developed properly and smoothly, it will strengthen not only its own economic and social base but also that of other areas in the Region such as the eastern part of the province. In other words, West Coast Tapanuli is an area which should receive strong policy support at present; otherwise it might give adverse effects on the balanced development of the whole Region in the future.

2. Program Area

305. The program area covers 21,095 km^2 and the population is about 1.2 million in 1987. The area can be divided into the following four sub-areas in terms of geographical, demographic and socio-economic conditions:

(i) North Western Coast Area (NWC): Kotamadya Sibolga, Barus, Sorkam, Sibolga, Lumut

(ii) South Western Coast Area (SWC): Natal, Batang Natal

(iii) Central Valley Area (CV): Kotanopan, Muara Sipongi, Panyabungan, Siabu, Batang Angkola,Padangsidempuan, Batang Toru, Sipirok

(iv) Eastern Plateau Area (EP): Sosa, Barumum, Barumum Tengah, Sosopan, Padang Bolak, Dolok, Saipardolok Hole

Sub Area	Area (km^2)	Pop.('87)	Density (Pop./km^2)
(i) NWC	2,198.0	263,699	120.0
(ii) SWC	4,037.0	78,512	19.4
(iii) CV	6,163.7	546,323	88.6
(iv) EP	8,695.8	278,838	32.1
Total	21,094.5	1,167,372	55.3

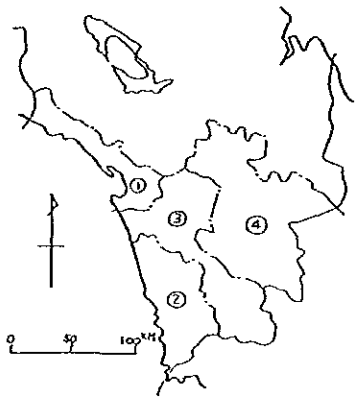


Figure 35. Sub-Area

306. At present, in the agricultural sector rice production in food crops, and rubber, coffee and clove in estate crops are dominant in terms of its share of production in the province (Table 47). Today, a few irrigation projects are being implemented; most of them are included in the Second and Third Irrigation Sector Program by the Asian Development Bank. A considerable number of investments in large-scale plantations, mainly oil palm, have been either approved or proposed, especially in the eastern plateau, involving some 150,000 ha. On the other hand, industrial agglomerations are not found in the area. Presently only a few industries such as wood and furniture products, food processing, textile products (ulos), souvenir goods using small woods, rattan, shells and so forth exist in the area (Table 48). Besides, most of them are not large and medium industries, but home industries.

Talbe 47 Agriculture in West Coast Tapanuli

Agricultue (1986)	Harvested Area (ha)			Production (ton)		
	West Coast Tapanuli	North Sumatra	Share of West Coast Tapanuli (%)	West Coast Tapanuli	North Sumatra	Share of West Coast Tapanuli (%)
Food Crops						
Wet Land Paddy	88,720	530,693	16.44	343,179	2,029,982	16.91
Dryland Paddy	1,509	79,824	1.89	2,858	158,010	1.81
Maize	1,113	58,755	1.89	1,544	119,849	1.29
Cassava	1,084	19,784	5.48	9,556	247,635	3.86
Sweet Potatoes	421	14,335	2.94	2,419	131,168	1.84
Peanuts	1,283	12,241	10.48	1,581	14,957	10.57
Soybeans	1,599	21,900	7.30	1,495	20,218	7.39
Small Green Pea	944	3,619	26.08	1,116	3,423	32.60
Estate Crops (Smallholders)						
Rubber	121,444	319,266	38.04	62,372	166,018	37.57
Palm Oil	1,486	47,162	3.15	0	34,581	0.00 (Palm Oil)
				0	4,744	0.00 (Palm Kernel)
Coffee	14,234	64,443	22.09	9,412	42,188	22.31
Pepper	13,916	137,440	10.13	6,675	84,876	7.86
Cocoa	134	2,578	5.20	5	332	1.51
Clove	5,168	24,422	21.16	681	2,280	29.87
Benzoin	111	23,292	0.48	19	4,149	0.46
Cassia Vera	1,859	4,846	38.36	508	650	78.15
Aromatic Oil	458	1,354	33.83	49	153	32.03
C.O. Nut	144	4,247	3.39	67	4,504	1.49
Tobacco	184	415	44.34	59	163	36.20
Sugar Cane	29	875	3.31	15	681	2.20

Table 48. Number of Establishments, and Number of Persons Engaged of Large and Medium Industry in West Coast Tapanuli in 1985

Industry	Number of Establishments	Number of Persons Engaged
Food, Beverage & Tobacco Products	7	225
Textile, Ready made Clothing & Leather Products	0	0
Wood & Furniture Products	16	1,924
Paper & Paper Products, Publishing & Printing Products	0	0
Chemical, Kerosene & Coal, Rubber & Plastic Products	5	886
Non Metallic Mineral Products	1	21
Basic Industries	0	0
Manufacture of Metal, Machineries & Equipment	0	0
Other Manufacture	0	0
Total	29	3,056

Source: Statistical Office, Province of North Sumatra.

The program area is described by sub-area as follows.

(i) North Western Coast Area

The area is divided into two zones; the coastal zone which has 140 km long coastline and relatively flat lands, and the inland zone which has mountainous and forested areas. The coastal area has a large development potential for agriculture. Sibolga is a good natural harbor; a trading port with a long history and the second largest port on the west coast in the Region. Besides, it is a main gateway to Nias. However, the route change of the Trans Sumatra Highway has given adverse effects on the area, especially on Sibolga in terms of economic activities. For instance, the occupancy rate of hotels went down from 70% in 1985 to 40% in 1989. Revitalization of Sibolga is quite crucial to the future development.

(ii) South Western Coast Area

The area has a large development potential for agriculture, in particular estate crops along the coastline. However, lack of infrastructure such as roads, electricity and so forth prevents the area from development.

(iii) Central Valley Area

The area stretches north-south along the Barisan range. In like manner the Trans Sumatra Highway passes through the area. Therefore, the area has relatively better accessibility to other areas such as Medan, Bukittinggi and Padang. Generally rice production is well developed, but the availability of new land is limited largely due to the area's topography. Therefore, food crop diversification and intensification on wetland, and smallholder estate crop rehabilitation and diversification are considered desirable. Small/home industry developments are also desirable. Padangsidempuan is a fast growing urban center which is located at strategic crossroads on the Trans Sumatra Highway, a halfway junction between Medan and Bukittinggi/Padang connecting to Sibolga westward and Rantauprapat eastward.

(iv) Eastern Plateau Area

The area is the upstream part of the Barumun and Rokan rivers which flow eastwards into the Straits of Malacca. Considerable part of the area is classified as critical land, because of relatively limited rainfall and the past overexploitation, with little vegetation other than grass and scattered low scrubs. Rice is the main product, but the irrigable land is rather limited. However, investments in large-scale plantations, mostly oil palm, have been picking up since mid-1980s. The present road conditions and network are not so favorable to the future development. Gunungtua is a local service center in the area.

3. Development Potentials and Constraint

3.1. High Development Potential Sector in the Whole Area

307. High development potential sectors are as follows:

(i) Agriculture: food crop production, estate crops (rubber, oil palm, coffee, etc.), live stock (cattle)

(ii) Industry: small/medium industry, home industry (agro-industry, rattan, traditional textile, souvenir goods, food processing, agricultural equipments, etc.)

(iii) Tourism: tourism object utilization along the Trans Sumatra Highway, beach/marine resort development

3.2. General Constraints in the Whole Area

308. The area's constraints are:

(i) lack of infrastructure

- insufficient local road network (feeder road network, underutilization of Sibolga port, insufficient urban infrastructure in Sibolga, Padangsidempuan and other urban centers)

(ii) lack of industrial agglomeration (agro-industrial base)

3.3. Development Potentials and Constraints by Sub Area

309. Development potentials and constraints by sub-area are summmarized below:

Sub Area	Potentials	Constraints
North Western Coast Area	-irrigation and drainage for wetland -plantation development (rubber, oil palm) -mariculture (seaweed, etc.) -home industry (rattan, food processing, souvenir goods, etc.) -beach/marine resort development (Poncan Island, etc.)	-the route change of Trans Sumatra Highway -underutilization of Sibolga port -coastal swamp area -insufficient urban infrastructure in Sibolga (urban drainage)
South Western Coast Area	-plantation development (coconut, cocoa, rubber) -rattan -fisheries (shrimp culture, coastal/off-shore fisheries) -mining (gold, coal, etc.) -timber -mini hydro	-insufficient road network -less inhabited area -insufficient fishery technology
Central Valley Area	-food crop diversification and intensification (rice and palawija) -smallholder estate crop development and diversification -small/medium scale industry (agro-processing - oil seeds, starch and food processing, etc.) -home industry (rattan, traditional textile, furniture, souvenir goods, agricultural equipments, etc.) -tourism (Sipirok, Hutagodang, etc.)	-insufficient feeder road network for the Trans Sumatra Highway -insufficient urban infrastructure in Padangsidempuan (water supply, drainage, electricity, etc.)
Eastern Plateau Area	-plantation development (oil palm, rubber, cocoa, etc.) -livestock development (mainly cattle) -industrial forests -fruit development (citrus) -market-oriented dryland farming (palawija and horticulture)	-insufficient road network -critical land area -limited irrigable land

4. Development Goals and Strategies

4.1. Development Goals

310. The development goals are:

(i) to exploit various agricultural potentials in the area and to nurture Sibolga and Padangsidempuan as the development bases.

(ii) to facilitate the development of the area to catch up with the advanced eastern coastal area in terms of the living standard and the economic activities, and to contribute toward the achievement of balanced regional structure in the northern part of Sumatra.

4.2. Development Strategies

311. The strategic productive sectors in the area are primarily (i) agriculture, (ii) industry and (iii) tourism. And (i) transportation, (ii) urban development and (iii) telecommunication are considered key infrastructure sectors which promote and support the development of the productive sectors including not only the above mentioned ones but also the others. Key development programs by sector are listed below:

Strategic Productive Sector

(i) Agriculture

-agricultural diversification for smallholders

-irrigation and drainage for wetland

-NES/PIR projects in the North and South Western Coast Areas and the Eastern Plateau Area

-a demonstration ranch in the Eastern Plateau Area

-coastal/offshore fisheries and shrimp culture, and technical training

-afforestation/reforestation on the critical land

(ii) Industry

-promotion of small/medium-scale agro-industry, in particular, oil seeds, starch, canning and other food processing in addition to rubber processing and palm oil mills

-promotion of home industry, such as rattan, textile (ulos), furniture, souvenir goods, food processing (shrimp cracker, tahu, tempe, etc.), agricultural equipment (hoe, plow, etc.)

(iii) Tourism

-development and utilization of tourism objects along the Trans Sumatra Highway (i.e., hot springs in Sipirok, Hindu temple at Portibi, Hutagodang (traditional village), etc.)

-beach/marine resort development in Sibolga

-development of circular tour routes in connection with Lake Toba area, the Minang Highlands and Nias Island.

Key Infrastructure Sector

(iv) Transportation

-trunk road network development (Sibolga-Tarutung, Sibolga-Padangsidempuan, West coast road, etc.)

-local road network development (Siabu-Sibuhuan, Sibuhuan-Gunungtua, etc.)

-feeder road development for the Trans Sumatra Highway

-Sibolga port vitalization

(v) Urban development

-urban infrastructure development

Sibolga: urban drainage, water supply distribution system rehabilitation

Padangsidempuan: urban drainage, water supply, kampung improvement program, solid waste management

Panyabungan and Gunungtua: IUIDP planning

(vi) Telecommunication

-telecommunication development in the Central Valley Area

5. Identified Project and Phasing

312. The projects and programs identified based on the development strategies are listed in Table 49.

6. Selection of Priority Projects

313. Based on the development strategy the following projects are selected as high priority projects and so indicated in Table 49.

314. In the agricultural sector, the fundamental targets are (i) to attain food security, namely self-sufficiency of rice in the area, and (ii) to establish as a stable source of cash income. In that sense, the intensification, diversification and extensification of agriculture in the area are inevitable. The selected irrigation projects and the dryland farming systems development are primarily for the intensification and extensification. The livestock development project which includes a model cattle ranch and training/extension service facilities is expected to function as an initiator and a promoter of the livestock development.

315. In the fishery, the marine fishery development subcenter project is aimed at upgrading of small-scale fishermen's technology which is crucial to fully utilize the under-exploited fishery resources in the western water of Sumatra. Besides, the project will indirectly contribute to the revitalization of Sibolga port and the strengthening of urban functions in Sibolga.

316. In the industrial sector, it is very important to establish the agro-industry for the balanced economic structure in the area. Agro-processing industries should be fostered in parallel with food crops and estate crops developments. Craft industries should be also promoted as a key home industry whose market is primarily the province and tourists visiting the province.

317. In the infrastructure sectors, transportation, in particular the balanced and efficient road network development is prerequisite to the development of productive sectors. Not only the main road network but also the feeder road network developments should deserve high priority.

318. In the energy sector, the Sipang Sihaporas hydropower project will contribute to the energy supply to Sibolga and to the rural electrification program. Therefore, the project is practically prerequisite to other projects.

319. Sibolga and Padangsidempuan are expected to function as a major urban center and a development base in the area. Urban infrastructure development should be continued vigorously under the scheme of IUIDP (Integrated Urban Infrastructure Development Program) to strengthen urban functions in the two cities. In addition, emerging secondary urban centers in the area such as Panyabungan and Gunungtua should be included in the secondary cities urban development program, because they will become important development bases in their sub areas and function as a secondary node in the regional hierarchical urban system.

Table 49. West Coast Tapanuli IDEP Project List

P-4	West Coast Tapanuli														
Code	Project	REPELITA V					REPELITA VI					REPELITA VII & VIII	High	GFS	Pub Inv Rep. V
		89	90	91	92	93	94	95	96	97	98	1999 - 2008	Priority		(US$M)
	I. Productive Sectors														
A- 2	Tropical Fruit Development						-+	++	++	++	++	++++++++++++			
A- 5	Study of Brackish Water Aquaculture Sites		--	-											
A-19	Wetland Food Crop Intensif. and Diversif.		-	++	++	++	++	++	++	++	++		0	0	0.8
A-20	Dryland Farming Development		-	++	++	++	++	++	++	++	++		0	0	1.0
A-21	Paddy Post-Harvest Technology Development		-	++	++	++									
A-24	Livestock Development (beef cattle)		--	++	++	++	++	++	++	++	++		0	0	4.0
A-26	Smallholder Coconut Development			-+	++	++	++					++++++++++++	0	0	5.0
A-27	Smallholder Rubber Development						-+	++	++	++	++	++++++++++++			
A-28	Smallholder Coffee Development			-+	++	++	++	++	++	++	++	++++++++++++	0	0	2.0
A-29	Nucleus Estate and Smallholder Development										--	++++++++++++			
A-30	Brackish Water Aquaculture Development								++	++	++	++++			
A-32	Marine Fishery Developement Sub-Center		-	-+	++	++	++	+					0	0	4.0
A-33	Fishery Education						-	++	++	+					
A-34	Small-Scale Fishery Development		-	++	++	++	++	++					0	0	10.0
C- 4	South Natal Coal Resources Development			--	--								0	0	2.4
D- 4	Dev. of Marketable Handicraft Products		-	+	++	+							0	0*	0.4
D-39	Agro-Industries			-	++	++	++	++					0	0*	
D-42	Fishery/Aquaculture-Related Industries			-	++	++	++	++							
D-43	Livestock-Related Industries			-	++	++	++	++							
D-45	Handcraft Industries			-	++	++	++	++					0		
D-50	Light Engineering Industries		-	++	++	++	++								
H- 9	Agro-Forestry Development		--	--	++	++	++								
	II. Infrastructural Sectors														
B-45	Tarutung-Soruila Flood Control and Irrigation	-	-	+	++	++	++						0		15.0
B-46	Rawa Kolang Irrigation		--	--	++	++	++	++					0		15.0
B-47	Batang Angkola Irrigation		--	--		++	++	++	++				0		5.0
B-48	Hutaraja/Sangkunur Irrigation				--	--	++	++	++	++					
D- 7	Industrial Estate/Area (Sibolga)									--	++	++			
E- 1	Fuel Efficient Stove Dissemination				--	--	++	++	++	++	++	++++++	0	0*	0.7
E- 2	Rural Electrification			++	++	++	++	++	++	++	++	++++++++++++	0	0*	5.0
E-15	Mini-Hydropower	--	--		++	++									
E-18	Sipang Sipaporas Hydropower				++	++	++	++					0		50.0
E-24	Power Grid Expansion			+	++	++	++	++	++	++	++		0		20.0
F- 1	Arterial Road Upgrading		--	-	++	++	++						0	0*	60.0
F- 2	Road Disaster Prevention		--	-	++	++	++						0	0*	30.0
F-25	Rantauprapat-P.Sidempuan Road Network				++	++	++								
F-26	Aceh-Sibolga-West Sumatra West Coast Road									--	--	++++++			
F-27	West Coast Tapanuli Road Development			--	++	++							0	0	26.0
F-33	Sibolga Port Expansion			+	++	++							0		5.0
G- 4	Introduction of Rural Telecommunications		--	-	++	++	++	++	++	++	++		0	0*	10.0
G-15	Kotamedya Local Telephone Network Expansion		++	++	++	++	++								
G-16	Kabupaten Local Telephone Network Expansion							++	++	++	++				
G-20	100 Small Earth Stations Provision											--++++++++			
G-23	Coin Telephone Sets Provision		++	++	++	++	++	++	++	++	++		0		2.0
G-26	Telephone Outside Plant Maintenance Center							++	++			++++			
J- 1	Urban and Rural Water Supply Program I		--	++	++	++	++	++	++	++	++	++++++++++++	0		5.0
K- 3	Secondary Cities Urban Development	-	--	++	++	++	++	++					0		5.0
K- 7	Urban Drainage and Solid Waste Program	-	--	++	++								0		10.0
K- 8	Urban Road Improvement Program				--	-+	++	++							
	III. Others														
L- 6	ADP for Tapanuli Selatan		-	--	-+	++	++	++	++	++	++	++++			
P-12	Production and Marketing Study		--										0	0*	1.0
														Total	294.3

Notes: 1. ---- denotes "study," ++++ "implementation."
2. On-going projects are excluded from the list.
3. "GFS" stands for Guideline for Study. An asterisk (*) indicates that this Guideline for Study is common to several IDEPs.
4. Public investment is for Repelita V. The figures are subject to further study.

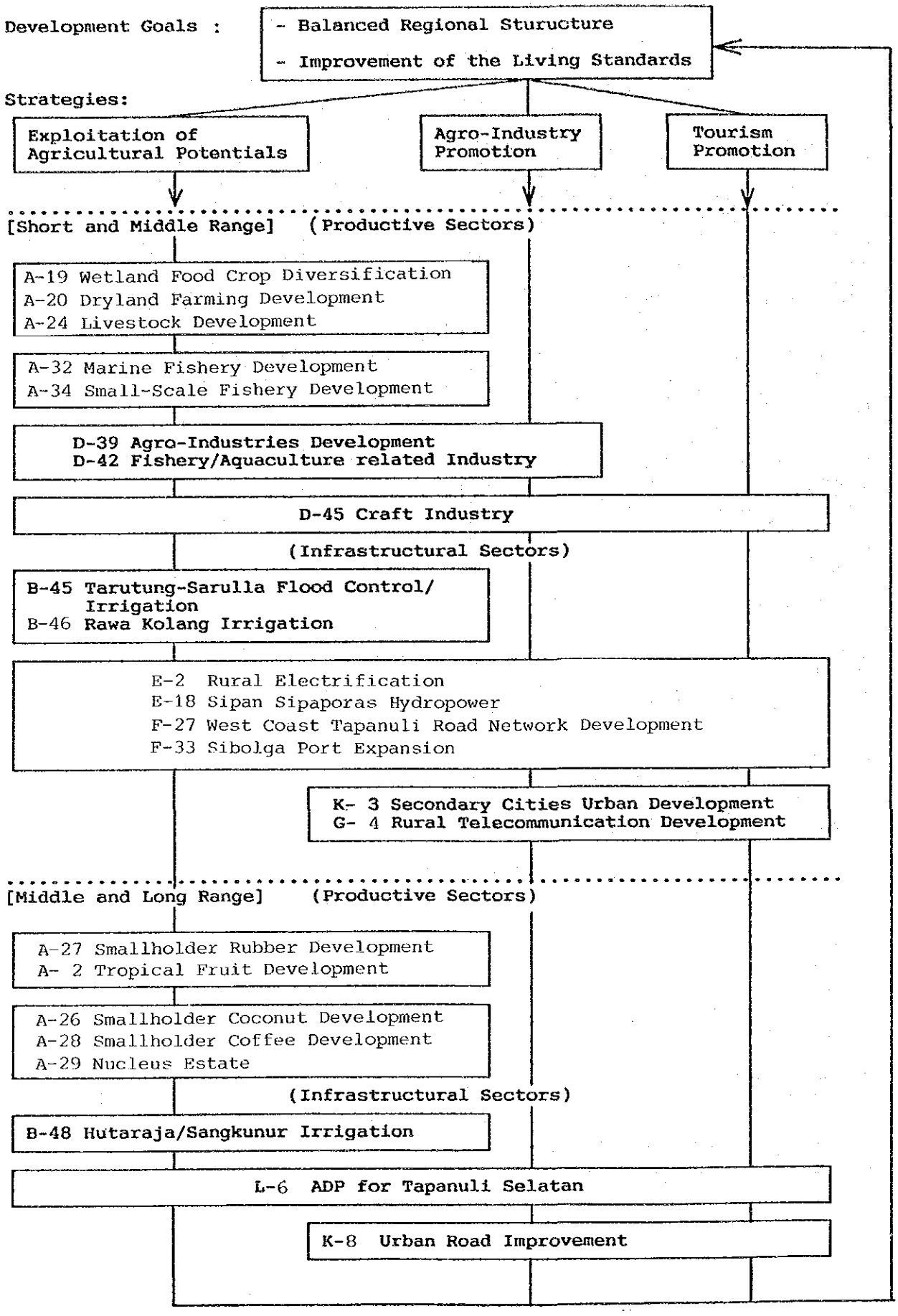


Figure 36. Relationship among Core IDEP Projects
(West Coast Tapanuli IDEP)

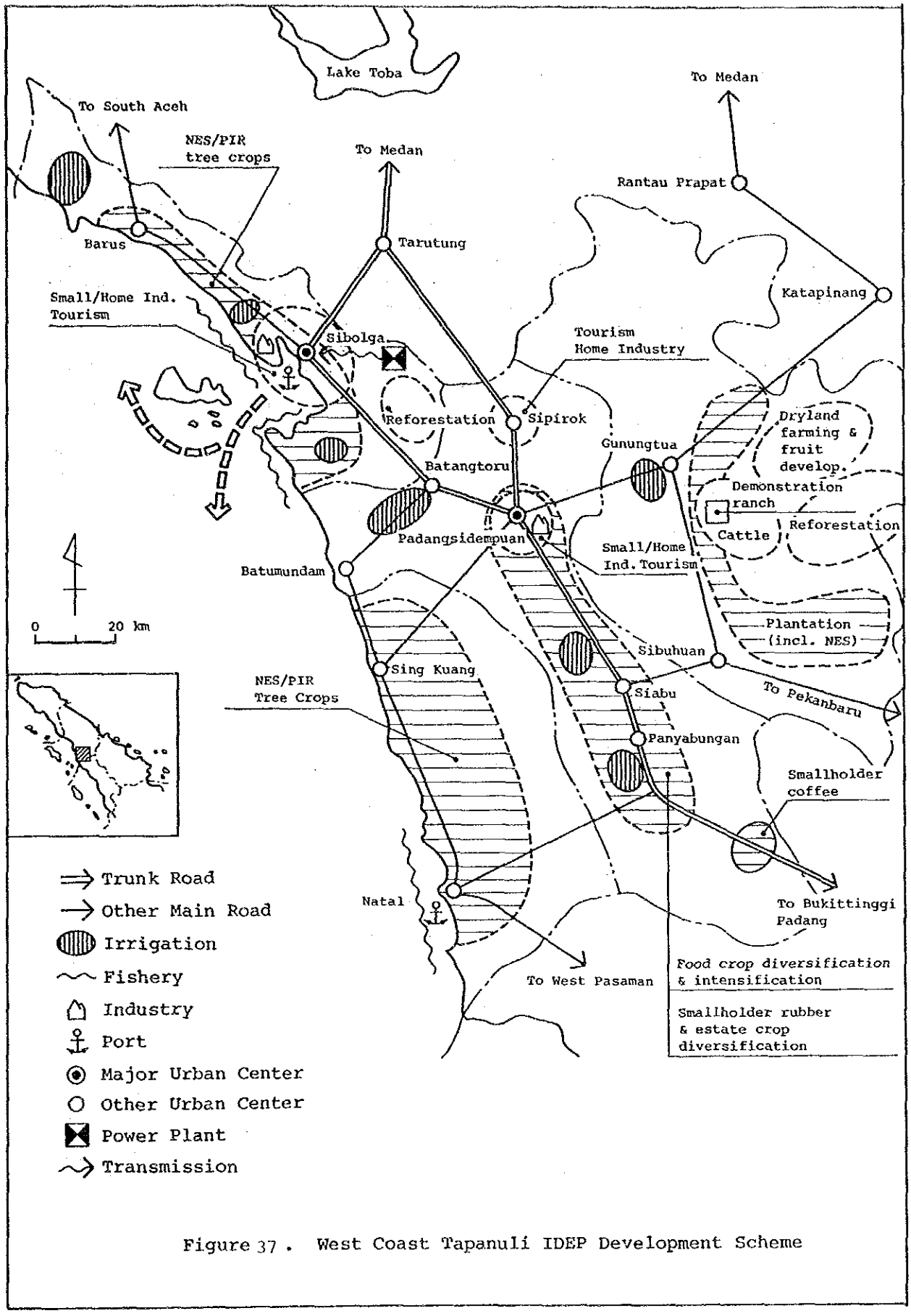


Figure 37 . West Coast Tapanuli IDEP Development Scheme

E. Nias Island Integrated Development Program

1. Background

320. The most fundamental goals of national development in Indonesia are equity, growth and stability, which are also adopted in Repelita V. Therefore, to raise the living standard of local people in backward areas and to narrow the economic disparity among regions will be one of the most important objectives for development policy. Nias Island, which is the largest island in Kabupaten Nias, North Sumatra Province, is located in the Indian Ocean 135 km west from Sumatra Island and involves the capital of Kabupaten Nias. The Island has 5,450 km2 of land area, which occupies 96.6 % of Kabupaten Nias, and 537,690 of population in 1987. Despite of high population density, the Island is a backward area where its regional economy is small in scale and its basic infrastructure is not sufficient in quality and quantity mainly due to the nature of the isolated island. The Government of Indonesia has put high priority on the development of remote areas like Nias Island from the viewpoint of improvement of socio-economic status of such remote areas. And also, the successful development of Nias Island will offer a model case of island development in the Indian Ocean.

2. Program Area

2.1. Natural Conditions

(1) Climate

321. The climate of the area is similar to that of the climate in Sumatra Island, which is of a humid tropical nature in general. The average annual rainfall records between 1,800-3,000 mm, and there is no significant seasonal variation of rainfall in the year The air temperature is 25°C-26°C, and its humidity is 85%-89% almost all year round.

(2) Topography and Geology

322. Nias Island has a mountain range of about 500 m high above sea level, which directs NW-SE direction, and the highest altitude of the Island is 890 m above sea level. Most of the area consist of hilly land, and alluvial plains are limited around the coastal area. The soil conditions of the Island are mainly classified by altitude, namely acrisols is mainly found in the mountainous area, canbisols is in the hilly area and fuluvisols is in the lowland area. Generally, soils in the area have potential for agricultural production.

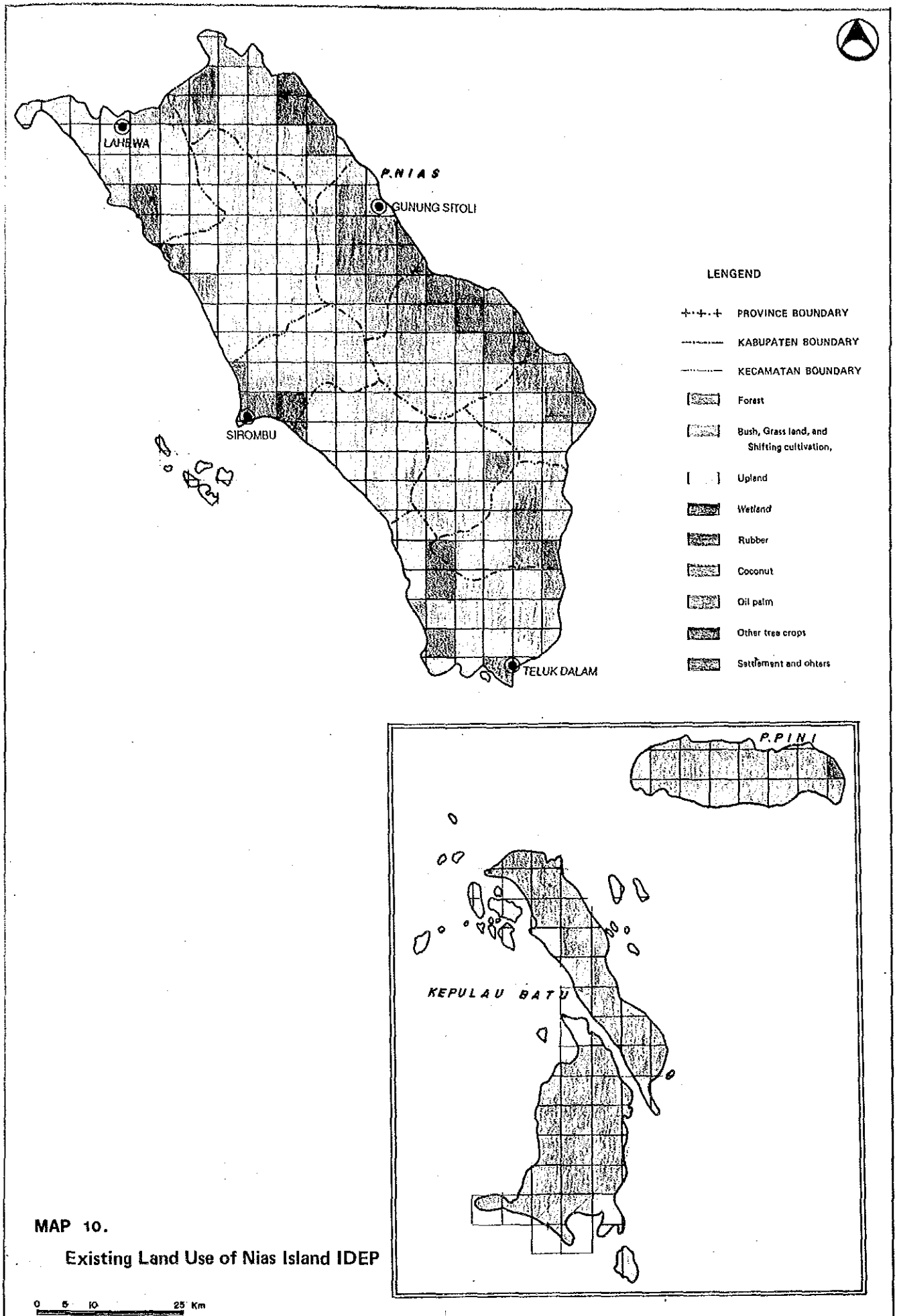
(3) Rivers

323. There are about 33 major rivers in the Island, and the length of the rivers are rather short due to the small size of the Island. Only 4 rivers, Muzoi River (71 km), Oyo River (64 km), Mola River (36 km) and Eho River (32 km), have the river length of over 30 km long. The most rivers in the Island are steep, the river slope being more than 1%.

2.2. Socio-economic Conditions

(1) Population

324. The total population of Nias District is 560,632 in 1987, and 96% of the total population are living in Nias Island. The population



MAP 10.

Existing Land Use of Nias Island IDEP

density of the Island is 98.7 person per km^2. The average growth rate of population in Nias District is 2.8% during 1981-1987 (Refer to Table 50).

(2) Economy

325. The livelihood of the people in the Island mostly rely on agricultural sector, and about 80% of the total population is engaged in agriculture. The economy in the area is not only under depressed conditions, but also its growth rate is lower compared with other regions in North Sumatra Province. The annual growth rate of GDP during 1975-1985 is only 4.2%, while 8.0 % in North Sumatra Province, and 9.1 % in Indonesia. Other sectors besides agriculture also remain undeveloped (Refer to Table 51). The per capita GDP is Rp. 235,092 in 1985, which is only about 50% of that in North Sumatra Province and only 40% of that in Indonesia. These indices show Nias Island is under backward conditions, and increased socio-economic development is given high priority.

(3) Land Use

326. The land is used for various purposes, and its use generally depends on the topographic characteristics of the land. The alluvial area is used for rainfed or irrigated paddy fields, and hilly and mountainous area is used for cash crops, upland rice and tree plantation. The coastal area is generally used for coconut plantation. However, in the Island, there are small areas which are covered by tropical rain forests (Refer to Table 52).

2.3. Sectoral Conditions

(1) Agriculture

327. Agriculture is the most important sector for the economy of the area, and it shares the greatest part of the total production in Nias District. The major food crop is rice, whose production in 1987 was 123,501 tons in dry paddy from the total harvested area of 49,962 ha. However, production rate is short by about 20,000 tons to the local demand of consumption, and about 10,000 tons of rice is annually imported from Sumatra Island. For the growing population in the remote islands, it is considered essential to secure the self-sufficiency of staple food since potential irrigable areas still remain undeveloped. The total harvested area of paddy in Kabupaten Nias is 49,962 ha in 1987, comprising wet land paddy of 28,854 ha and dry land paddy of 21,108 ha. Out of the total wet land paddy field of 21,491 ha, only 1,393 ha is provided with irrigation system (Refer to Table 53). In 1987, the yield rate of wet land paddy is about 3.15 tons per ha, and of dry land paddy is 1.55 tons per ha, which is lower than that of North Sumatra Province. As for cash crops, coconut is widely planted in the area, followed by rubber, clove, coffee, patchouli and nutmeg. These cash crops are usually produced by small holders (Refer to Table 54).

(2) Industry

328. Industry of the Island is under undeveloped condition. There are 16 industrial establishments with production facilities worth above Rp. 70 million in the Island. These are, 12 coconut oil mills, 1 saw mill and 3 printing offices, altogether employing 338 persons. Besides, there exist 998 small/cottage industries in 1987, giving employment opportunities to 2,656 persons. More than half of these units are concentrated in Kec. Gunung Sitoli and Kec. Teluk Dalam. As

Table 50. Population of Nias Island

Kecamatan	Area (km2)	Population (person) 1980	1987	Population Growth (%) 1980-1987	Population Density (person/km2) 1987
Teluk Dalam	547.5	51,605	63,589	3.32	116
Lahusa	445.6	17,311	22,081	3.94	50
Gomo	172.6	30,045	35,235	2.47	204
Idano Gawo	570.5	34,265	43,846	3.99	77
Lolowau	484.2	37,075	44,273	2.77	91
Sirombu	223.8	13,440	16,000	2.72	71
Mandrehe	314.7	33,990	40,160	2.59	128
Gido	553.6	57,181	69,143	2.99	125
Gunung Sitoli	452.5	72,698	85,051	2.43	188
Alasa	653.4	29,706	35,944	3.00	55
Lahewa	574.6	30,862	34,633	1.75	60
Tuhemberua	456.8	39,612	47,735	2.93	104
P.P. Batu	175.3	20,231	22,942	1.91	131
Total	5,625.1	468,021	560,632	2.83	100
except P.P. Batu	5,449.8	447,790	537,690	2.87	99

Source: Kabupaten Nias Dalam Angka 1987

Table 51. GDP in Kabupaten Nias (1983 constant price)

Sector	Unit	1983	1984	1985
Agriculture	(Rp. bil)	42.55	45.29	47.59
Mining	(Rp. bil)	0.25	0.27	0.28
Manufacturing	(Rp. bil)	1.23	1.31	1.38
Others	(Rp. bil)	41.70	44.38	46.64
Total	(Rp. bil)	85.73	91.25	95.88
GDP in N. S. Prov.	(Rp. bil)	3,131.13	3,390.22	3,528.12
GDP Share(N.S. Prov)	(%)	2.7	2.7	2.7
GDP Growth Rate	(%)	6.4	5.1	5.3
	(period)	1983-1984	1984-1985	1985-1988
GDP per capita	(Rp. mil)	0.17	0.18	0.18

Source: Propinsi Sumatra Utara Dalam Angka 1988

Table 52. Land Use Condition of Kabupaten Nias

Land Use Pattern	Area (ha)	(%)
Settlement	11,788	2.1
Wet land paddy	21,491	3.8
Dry land paddy	223,632	39.8
Small estate	55,768	9.9
Large estate	2,266	0.4
Forest & grassland	18,319	3.3
Others	229,226	40.8
Total	562,490	100.0

Source : Monografi Kabupaten Daerah Tingkat II Nias 1986

Table 53. Existing and Potential Area of Irrigation in Nias Island

Name of Area	Kecamatan	Irrigable Area (ha)	Irrigated Area (ha)	Potential Area (ha)
Ndra Humene	Gido	314	297	17
Gido Sebua	Gido	1,428	0	1,428
Torowa	Tuhemberua	262	213	49
Afia	Tuhemberua	713	542	171
To'o Himbowo	Gunung Sitoli	150	115	35
Idano Zala	Teluk Dalam	390	226	164
Eho	Teluk Dalam	1,000	0	1,000
Mezawa	Idano Gawo	2,300	0	2,300
Idano Mola	Idano Gawo	3,500	0	3,500
Muzoi Humanga	Lahewa	2,600	0	2,600
Sobaewa	Lahewa	1,000	0	1,000
Tumura	Alasa	600	0	600
Siwalawa	Lolowau	350	0	350
Total		14,607	1,393	13,214

Source: Daftar Ululan Proyek Tahun 1989/1990, Cabang Dinas PU Pengairan Nias, 1988

Table 54. Harvested Area and Production of Food Crops and Cash Crops

Crop	Unit	1981	1982	1983	1984	1985	1986	1987
Wet Land Paddy								
Harvested Area	(ha)	20,585	22,073	24,410	24,577	26,090	28,585	28,854
Production	(ton)	78,883	78,366	83,006	84,987	90,827	109,983	90,832
Unit Yield	(ton/ha)	3.83	3.55	3.40	3.46	3.48	3.85	3.15
Dry Land Paddy								
Harvested Area	(ha)	9,660	16,306	16,350	16,542	16,683	16,788	21,108
Production	(ton)	17,416	25,617	25,922	26,248	26,644	26,862	32,669
Unit Yield	(ton/ha)	1.80	1.57	1.59	1.59	1.60	1.60	1.55
Maize								
Harvested Area	(ha)	3,789	3,589	3,281	3,380	4,150	4,408	4,053
Production	(ton)	3,031	2,870	2,542	2,700	3,337	3,392	3,205
Unit Yield	(ton/ha)	0.80	0.80	0.77	0.80	0.80	0.77	0.79
Cassava								
Harvested Area	(ha)	7,148	9,172	9,187	9,885	9,933	7,781	7,547
Production	(ton)	57,531	85,291	94,518	101,470	103,038	80,322	80,632
Unit Yield	(ton/ha)	8.05	9.30	10.29	10.27	10.37	10.32	10.68
Sweet Potato								
Harvested Area	(ha)	11,478	8,131	8,762	8,874	8,010	6,966	7,260
Production	(ton)	58,701	53,685	61,164	61,319	56,455	53,183	63,199
Unit Yield	(ton/ha)	5.11	6.60	6.98	6.91	7.05	7.63	8.71
Ground Nuts								
Harvested Area	(ha)	47	50	49	56	59	51	78
Production	(ton)	38	40	39	46	59	45	67
Unit Yield	(ton/ha)	0.81	0.80	0.80	0.82	1.00	0.88	0.86
Rubber								
Harvested Area	(ha)	17,072	17,078	17,100	17,976	19,797	20,246	21,278
Production	(ton)	6,198	7,634	6,292	8,494	8,100	8,852	10,200
Unit Yield	(ton/ha)	0.36	0.45	0.37	0.47	0.41	0.44	0.48
Coconut								
Harvested Area	(ha)	32,577	31,987	32,063	35,339	39,643	41,145	41,807
Production	(ton)	16,492	22,589	22,421	23,594	27,753	30,725	32,210
Unit Yield	(ton/ha)	0.51	0.71	0.70	0.67	0.70	0.75	0.77
Coffee								
Harvested Area	(ha)	777	777	780	910	961	1,008	1,146
Production	(ton)	163	162	164	200	286	454	487
Unit Yield	(ton/ha)	0.21	0.21	0.21	0.22	0.30	0.45	0.42
Clove								
Harvested Area	(ha)	1,179	1,375	1,375	1,719	1,680	1,719	1,933
Production	(ton)	71	77	113	140	237	273	290
Unit Yield	(ton/ha)	0.06	0.06	0.08	0.08	0.14	0.16	0.15
Nutmeg								
Harvested Area	(ha)	144	144	144	154	154	158	137
Production	(ton)	48	47	52	41	44	51	57
Unit Yield	(ton/ha)	0.33	0.33	0.36	0.27	0.29	0.32	0.42
Patchouli								
Harvested Area	(ha)	631	667	662	531	661	756	737
Production	(ton)	69	73	73	65	79	93	100
Unit Yield	(ton/ha)	0.11	0.11	0.11	0.12	0.12	0.12	0.14

Source: Kabupaten Nias Dalam Angka 1985, 1986, 1987

expected, their size is very small and number of persons engaged averaging 2.7 persons per unit, and the mean investments amounting to only Rp. 650 thousand. Thus the contribution of these industries to GDP in Kab. Nias is only 1.4 % in 1986.

329. A number of these industries are found in geographical concentration, forming clusters. In Hilisimaetano, Kec. Teluk Dalam, 93 units are engaged in patchouli oil production with 183 persons, and in Simarahili Sambualahe, Kec. Gunung Sitoli, there are 22 units making bricks employing 116 persons. Other clusters of some importance include those engaged in the production of salted fish, "pandan" craft, wood products and blacksmith.

(3) Transportation and Telecommunication

330. Transportations between Nias Island and Sumatra Island are two ways, one is by air to and from Medan or Padang, the other is by sea from Sibolga or Padang to Gunung Sitoli, Teluk Dalam, Lahewa and Sirombu. Road network in the Island has not been completed yet, and several trunk roads which connect between Gunung Sitoli and the capital of each Kecamatan remain unpaved. About 30% of provincial roads and 96% of district roads are unpaved and impossible to pass by car. As for telecommunication, there is no telephone network in the Island and a telephone line is only connected between Gunung Sitoli and Sumatra Island.

(4) Electricity

331. There are 3 diesel power plants, each at Gunung Sitoli, Teluk Dalam and Lahewa, and these power plants provide electricity to the limited areas. Total installed capacity is about 1,612 kW in 1987. Beside these PLN's plants, very limited electricity generated by private plants is provided to small communities.

(5) Tourism

332. Potential tourism spots are mainly located in the southern part of the Island. Lagundri Beach is one of the principal tourism spots, which is popular for sea bathing and surfing. Bawamataluo and Hilisimaetano are famous for their traditional heritages. Centuries-old monuments originated from Assam, India are also found at Gomo. At present, very few foreign tourists visit the Island mainly due to the lack of accommodation facilities and access roads.

3. Development Potentials and Constraints

3.1. Development Potentials

333. The following development potentials can be considered in the Island:

(i) A vast and suitable area for agricultural production

- about 70,000 ha of suitable areas for wetland paddy which includes about 13,200 ha of irrigable area

- very large suitable areas for tree crops, e.g., about 77,000 ha for rubber, 26,000 ha for coconut, and 88,000 ha for oil palm plantation

- high physical potentials of crop diversification such as clove, cocoa, pepper, sugar cane, cashew, and pineapple

(ii) Abundant marine resources for fishery

- high potential of off-shore fishery, such as tuna and sea weeds

(iii) Large areas for tree plantation for industrial use

- vast suitable areas for reforestation

- no difficulties on land acquisition for large scale reforestation

(iv) Relatively high potentials of agro-industries by using products of tree crop

- high possibility of establishing crumb rubber factories and oil mills

(v) Unique cultural heritage, historical remains, and scenic beauty as well as marine resort which potentially attract foreign and domestic tourists

3.2. Constraints

334. As for constraints, the following points can be considered in the Island:

- Extensive land use for agricultural production

- Areas which are relatively good for food crops have been utilized for estate plantation

- Low land areas have not been opened yet mainly due to difficulties to develop swampy area

- Existing irrigation canals have suffered from slope sliding caused by poor physical conditions of soil and ground

- Lack of an integrated area development master program based on detailed social indicator survey

- Poor transportation infrastructures for productive sectors and tourism development

- Lack of sufficient facilities for promotion of agro and marine production, and tourism

4. Development Goal and Strategy

4.1. Development Goal

335. A goal of the Nias Island IDEP is to upgrade living standard of the people in Nias Island by encouraging its own development activities with closer relation between Nias Island and Sumatra Island, through establishment of food security and attainment of sustainable development by using its natural resources. Development of the Island should be implemented steadily. At the first stage, agriculture, fishery and tourism are to be key sectors for development of the Island, and various projects of those sectors are expected to become a momentum for further development stages. Forestry sector is to play an important role of sustainable development. Then, industry sector, such

as agro-industry, fish-processing industry and wood industry, is to be introduced in the next stage. Development scenario of the Nias Island IDEP is illustrated in Figure 38.

4.2. Development Strategy

336. The following 6 strategies should be taken to achieve the goals of the Nias Island IDEP mentioned above:

(1) Promotion of food production

- to achieve self-sufficiency of rice by rehabilitation, upgrading and expansion of irrigation systems
- to increase productivity of agricultural products by introducing high yield varieties, improved cultivation methods, and post-harvest technology
- to promote food crop diversification by multiple cropping on paddy field and establishment of extension centers, demonstration farms, through a systematic social indicator survey
- to promote efficient and intensified land use,

(2) Promotion of estate crop production

- to increase production of tree crops through rehabilitation of the existing plantation and introduction of high yield varieties
- to promote estate crop diversification, such as cocoa, spices,essential crops, through a systematic social indicator survey
- to promote export of products by improving transportation system and marketing system
- to promote agro-industries

(3) Promotion of fishery development

- to increase production of marine products such as tuna, bonito and sea weeds by improving equipment and introducing appropriate skills
- to promote export of marine products by improving transportation systems, other necessary facilities, and marketing systems
- to promote fish-processing industries

(4) Promotion of tourism development

- to activate the regional economy
- to increase foreign and domestic tourists by improving transportation system and necessary infrastructures
- to preserve traditional communities and hamlets, and historical assets and remains

(5) Promotion of reforestation for land conservation and forestry development

- to promote rehabilitation of critical lands by replanting trees and preventing wildfire
- to enhance forest protection, forestry management and resettlement of local people
- to restore forest resources and potentials for wood production in future

(6) Improvement of minimum infrastructure to meet Basic Human Needs

- to provide minimum infrastructure to the local people for upgrading their living standard, e.g., improvement of transportation and telecommunication systems, water supply and solid wastes management
- to supply electricity by constructing promising hydroelectric power plants as indigenous and renewable energy

5. Identified Projects

337. Total 25 projects are identified for the Nias Island IDEP. A list of identified projects with their implementation phases is shown on Table 55, and their location is shown on Figure 39.

6. Selection of Priority Projects with Reasoning

338. The following projects are selected as the priority projects for Nias IDEP.

(1) Wetland Food Crop Intensification and Diversification (A-19)

339. The agricultural sector has two goals to address to the future development of the Island, namely, to attain food security and to increase its income earning capacity. Therefore, it is needed not only to increase the output of rice but also to improve the nutritional standards through more diversified utilization of available farm land.

(2) Paddy Post-Harvest Technology Development (A-21)

340. In order to attain food security for rapidly growing population, the reduction of losses during harvest and post-harvest operation is one of key projects to be promoted.

(3) Smallholder Coconut Development (A-26)

341. In the Nias Island, two tree crops, coconut and rubber, have long been the major sources of cash income. Therefore, promotion of these tree crops' production is essential to increase income-earning capacity. In view of the presence of oil mills on the Island, the increased production of coconut can be considered as having greater socio-economic impact.

(4) Small-Scale Fishery Development Project (A-34)

342. Despite of rich marine resources around Nias Islands, fishery production has been very small mainly due to poor fishing gears and

skills of fishermen. And fishery infrastructual facilities of fishing ports are also insufficient in Nias. Therefore, to promote fishery development by providing modern fishing facilities and improving necessary infrastructures must be indispensable to upgrade the living standard of fishermen in Nias Island.

(5) Irrigation and Agricultural Diversification Project (B-42)

343. In line with a policy on food security in remote areas, increase of rice production should be given high priority. High potential areas are to be identified through subject to a feasibility study. TOR for this project was already prepared by Ministry of Public Works and it will be separately studied by JICA in 1989/90.

(6) Marketable Handicraft Products (D-4)

344. There is very small existing base of medium/large industries in the Island, which is not likely to grow so rapidly for some time in the future, while other sectors are not expected to create employment opportunities large enough to absorb the underutilized labour force. Many small/cottage industries are located in the depressed parts within the Island, where sources of additional income have to be found in order for the local people not to be left behind the economic take-off envisaged during the sixth Repelita period.

(7) Mini-Hydropower Development (E-15) and Rural Electrification Program (E-2)

345. In view of utilization of indigenous and renewable energy, hydropower development is to be promoted, and it will replace expensive existing diesel generation. It will introduce electricity to the numerous communities and encourage small community industries. One potential site for hydropower is identified on the Oyo River, where approximately 3,500 kW could be developed through diversion of water into the Siwalawa River. TOR for the feasibility study has been prepared by Ministry of Cooperatives.

(8) Nias Island Ring Road Development (F-28)

346. Improvement of transportation system especially roads is essential for development of the Island. Most part of provincial roads such as ring road and cross road are in fair and poor conditions, though some part (about 35 km) of the road linked between Gunung Sitoli and Teluk Dalam expect to be improved by the Government. Under such circumstances, improvement of the Nias Island Ring is very important to support agriculture land tourism development and to promote well balanced socio-economic development in the Nias Island IDEP.

(9) Remote Island Sea Transportation Service (F-32)

347. The port of Gunung Sitoli is the largest port in Nias Island, and playing an important role as a terminal for cargos and passengers between Nias Island and Sibolga. According to the statistics in 1988, the port handled 96,000 tons per year of cargos and 100,000 passengers per year. The port of Gunung Sitoli is furnished with two berthing facilities, which can accommodate more than 200,000 tons per year. Hence this port has enough cargo handling capabilities for the increasing cargo demand in future. On the other hand, concerning passenger demand ferry boat service between Nias Island and Sibolga is currently under consideration. In response to these demands, an adequate ferry facility should be developed in near future.

(10) Nias Island Airport Improvement (F-37)

348. Daily flight service from Medan to Binaka is provided by P.T. SMAC with one round trip. However, the capacity of the airstrip at Binaka airport limits the scale of airplane to 21 seats at maximum. Extension of the Binaka airport and a study for a new airport at Teluk Dalam is needed to meet increase demand of passengers, and to encouragement of inter regional activities and tourism through frequent air services.

(11) Rural Telecommunications (G-4)

349. Telecommunication has a very important role in the remote areas. But, the existing telecommunication network covers only few areas in the Nias Island mainly due to lack of necessary infrastructures and inadequate network system. Therefore, improvement of telecommunication systems and facilities are inevitable to upgrade living standard of the local people.

(12) Re/Afforestation (H-8)

350. In Nias Island, about 153,000 ha of lands have been designated as a permanent forest area. However, almost two third of the permanent forest area, at present, have been changed to a mixing condition of grass, bush and scrub. Uncontrolled deforestation has also caused soil erosion and deterioration of land productivity. Therefore, reforestation and rehabilitation of forest lands is essential not only to conserve soil fertility, and also to supply sufficient wood materials to the local people for daily use and industrial use.

(13) Nias Island Tourism Development (I-8)

351. Mainly due to lack of access road to potential tourism spots and insufficient facilities on existing and potential tourism spots, tourism has been a minor sector on regional economy of the Island. Development of its tourism potential is crucial to activate regional economy through increase of investment and job opportunity. And also, tourism sector is put high priority on the development policy of Repelita V of North Sumatra province. Thus, the Nias Island Tourism Development project is to be put high priority on the Nias Island IDEP.

Table 55. Nias Island IDEP Project List

P-5	Nias Island															
Code	Project	REPELITA V					REPELITA VI					REPELITA VII & VIII	High	GFS	Pub Inv Rep. V
		89	90	91	92	93	94	95	96	97	98	1999 - 2008	Priority		(US$M)
	I. Productive Sectors														
A- 2	Tropical Fruit Development											++++++++++++			
A-19	Wetland Food Crop Intensif. and Diversif.			-	++	++	++	++	++	++	++	++++++++++++	0	0	1.0
A-21	Paddy Post-Harvest Technology Development		-	++	++	++							0	0	0.8
A-25	Smallholder Pig Development						-	++	++	++					
A-26	Smallholder Coconut Development		-	++	++	++	++	++	++	++	++	++++++++++++	0	0	2.0
A-27	Smallholder Rubber Development											++++++++++++			
A-34	Small-Scale Fishery Development		-	++	++	++							0	0	2.0
A-37	Pilot-Scale Fish Processing				-	++	++	++							
D- 4	Dev. of Marketable Handicraft Products		-	++	++								0	0*	0.4
D-39	Agro-Industries					-+	++	++	++	+					
D-42	Fishery/Aquaculture-Related Industries					--	++	++	++						
D-43	Livestock-Related Industries						--	++	++	++					
D-50	Light Engineering Industries						--	++	++	++					
H- 8	Re/Afforestation Development		--	++	++	++	++	++					0	0	2.0
I- 8	Nias Island Tourism Development		--	-+	++	++	++						0		20.0
	II. Infrastructural Sectors														
B-42	Irrigation and Argicultural Diversification	--	--	++	++	++	++	++	++	++	++	++++++++++++	0		20.0
E- 1	Fuel Efficient Stove Dissemination					--	++	++	++	++	++	+++++++++			
E- 2	Rural Electrification	++	++	++	++	++	++	++	++	++	++	++++++++++++	0	0*	1.0
E-15	Mini-Hydropower		--	++	++	++							0		1.0
F-28	Nias Island Ring Road			++	++	++							0	0	27.0
F-32	Remote Island Sea Transportation Service		--	++	++	++							0	0*	2.0
F-37	Nias Island Airport Improvement			--	++	++	++						0		2.0
G- 4	Introduction of Rural Telecommunications			--	++	++	++	++					0	0*	2.0
G-17	Kabupaten Local Telephone Network Expansion											+++++++			
G-18	Subscriber Radio System											++++++++			
G-23	Coin Telephone Sets Provision					++	++	++	++	++					
	III. Others														
L- 7	ADP for Nias Island						--	--	++	++	++	++++++++++++			
P-12	Production and Marketing Study		--										0	0*	1.0
														Total	84.2

Notes: 1. ---- denotes "study," ++++ "implementation."
2. On-going projects are excluded from the list.
3. "GFS" stands for Guideline for Study. An asterisk (*) indicates that this Guideline for Study is common to several IDEPs.
4. Public Investment is for Repelita V. The figures are subject to further study.

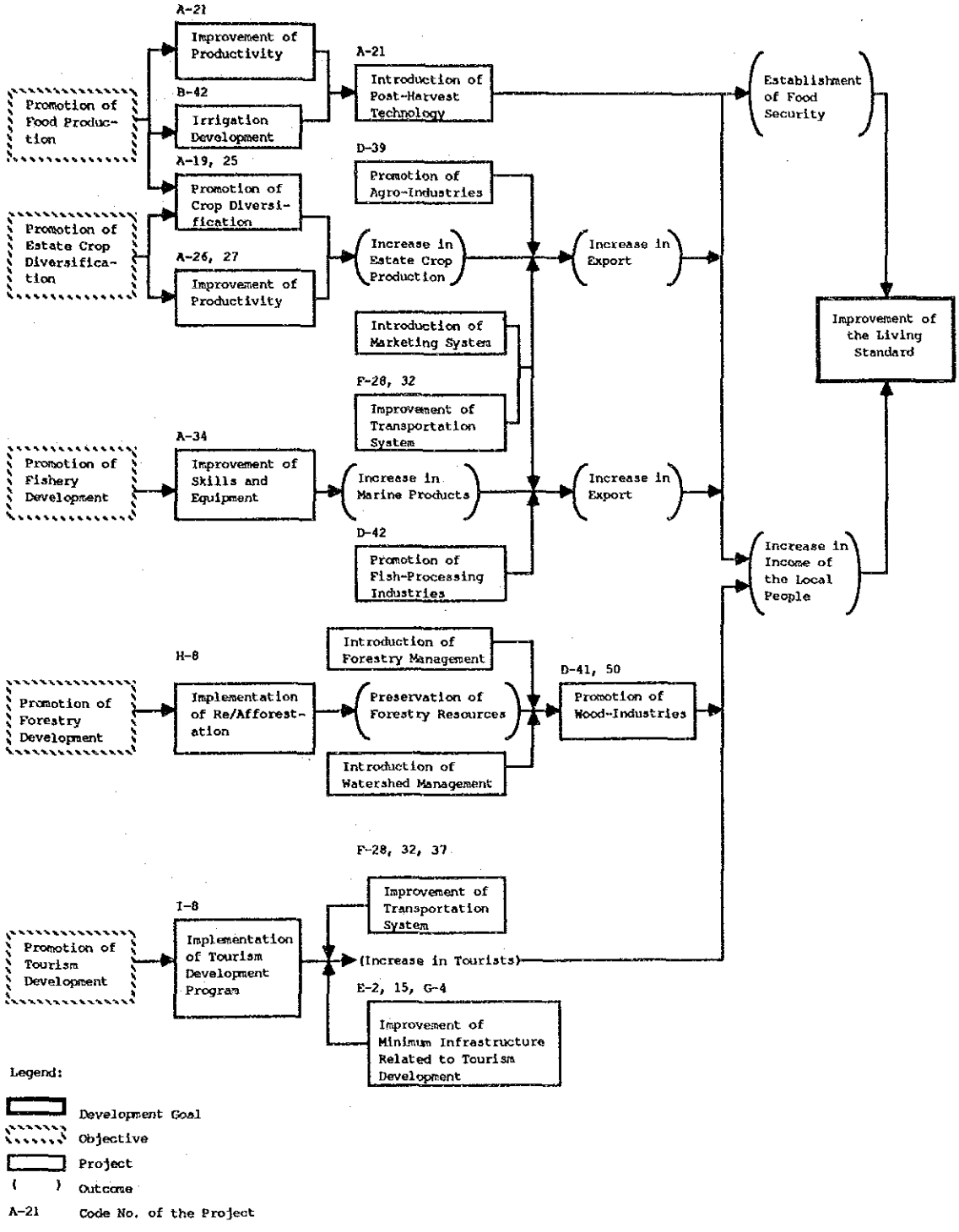


Figure 38. Relationship among Core IDEP Projects (Nias Island IDEP)

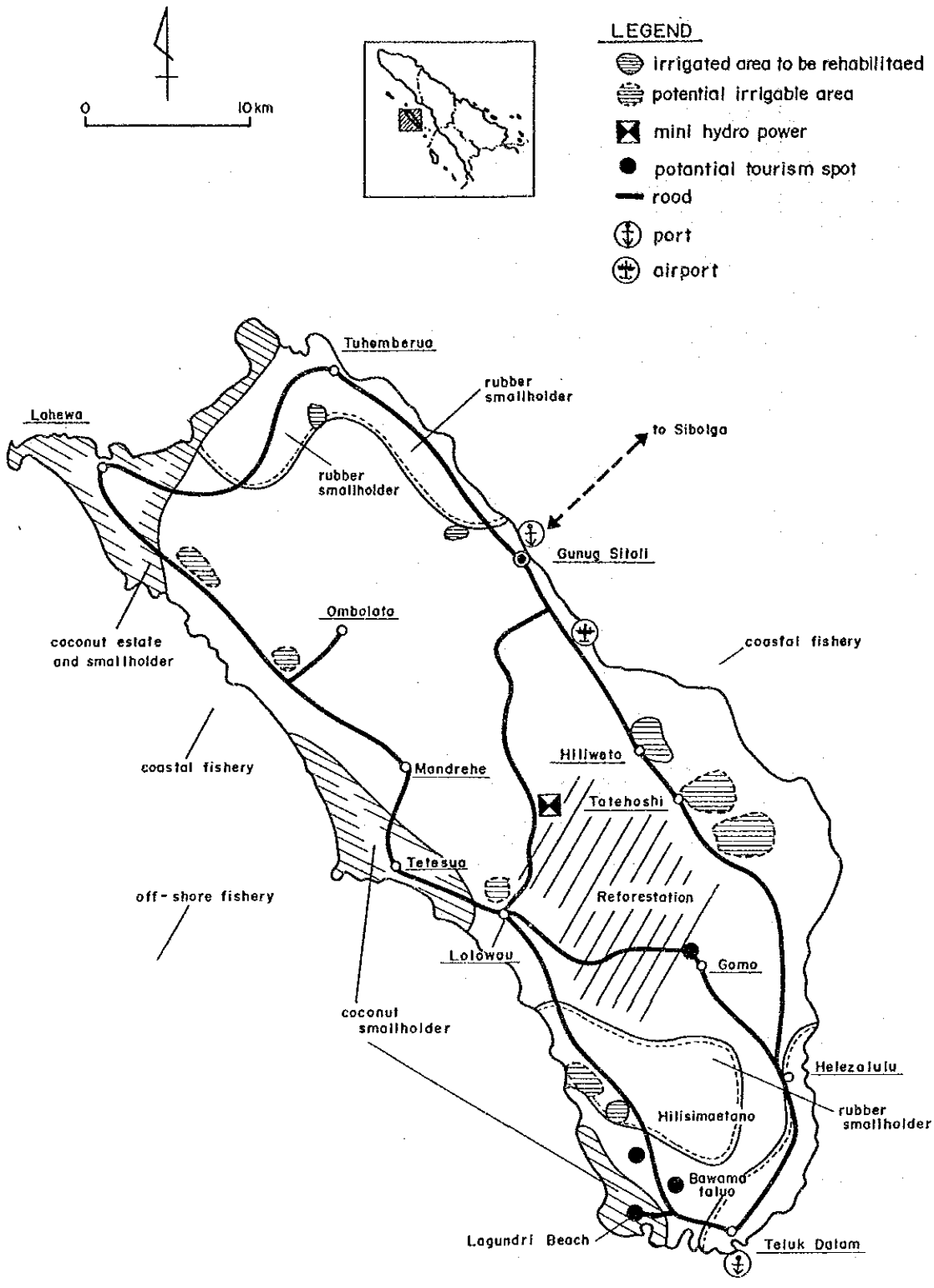


Figure. 39. Development Area of the Nias Island IDEP

F. Minang Highlands Integrated Development Program

1. Aims

352. The Minang Highlands served by three cities of Payakumbuh, Bukittinggi and Solok is well known for its advanced agriculture chiefly based on food crops. The future development will build on this advantage and the area will enhance its leading position in agriculture of the entire Sumatra. The infrastructural and other development for the area must be fully integrated with that of Padang.

2. Area Description

353. Agriculture in the three kabupatens in the Minang Highlands is primarily based on intensive cultivation of wetland paddy, but produces a variety of secondary and horticultural crops and agro-industrial products to supply urban centers like Padang and Pekanbaru. Some farmers have diversified into market-oriented poultry raising, notably in Lima Puluh Kota, and many practice small-scale freshwater fish culture. The area, moreover, has the Regional Food Crops Research Institute and the newly established Research Substation of Horticulture (fruits), which will no doubt support the further advancement and commercial diversification of agriculture.

354. Among the non-agricultural sectors in the area, the most important are the coal mines at Ombilin/Sawahlunto. Coal is transported by the railway through Solok and Padangpanjang to be supplied to the cement factory near Padang or shipped via the port of Teluk Bayur to domestic and overseas destinations.

355. The area has a number of attractions for domestic and international tourism, most notably its unique Minang cultural heritage and the waterfront scenery of Lakes Singkarak and Maninjau, although these tourism resources are not yet fully developed.

356. The area is strategically located in the crossroads of Trans-Sumatra Highway and the axis connecting from Padang to Pekanbaru and Dumai in Riau. Although the linkage between the three key cities of Bukittinggi, Solok and Payakumbuh is well served by good roads, feeder roads connecting these cities with surrounding towns and villages are on the whole underdeveloped.

357. It is necessary, however, to pay close attention to the possible environmental impacts of the future development efforts, because the area serves as the watersheds for many rivers flowing down toward the west coast and to the neighboring Riau Province. Incautious and inappropriate extensification of agriculture, especially on dryland, logging and mining will not only cause serious soil erosion within the area but affect such downstream areas.

3. Phasing

358. Repelita V:

(i) The primary focus will be on balanced agricultural development, first by consolidating the productive capacity of irrigated wetland, second, by promoting diversification into secondary and horticultural crops on well-drained wetland as well as dryland, and third, by advancing agro-industries. For this purpose, it will be important to improve, where necessary, the OMR of existing irrigation systems, and to provide improved seeds, extension services, labor-complementary mechanization, and other effective supports. Moreover,

it will be essential to develop and disseminate suitable integrated dryland farming systems, incorporating tree crops, livestock or poultry raising, etc. for additional income generation and fertility/soil conservation.

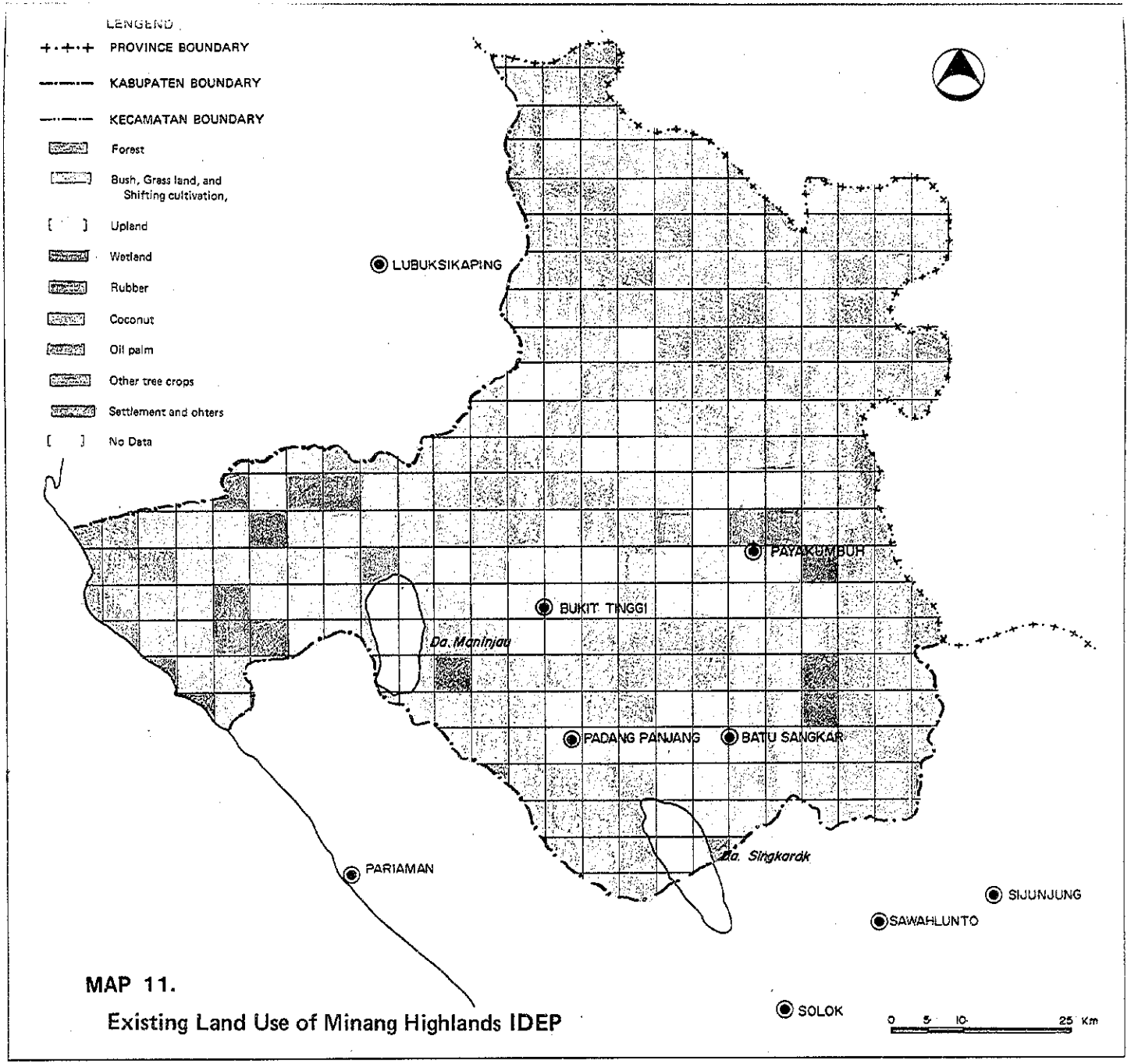
(ii) Basic urban infrastructure suitable to the secondary city must be developed first in Bukittinggi for tourism development in the area. In conjunction, urban infrastructure of Padang as the upper-class city closely connected with the area's development, must be upgraded in stages: namely, water supply, drainage and sewage treatment, telecommunications, electric supply, and so forth, For rural communities, it is necessary to provide better access to urban as well as local markets by improving feeder roads.

(iii) Afforestation and reforestation efforts must be stepped up in the watersheds of main rivers flowing to the west coast and to Riau in coordination with flood control measures being carried out in the downstreams. As part of environmental conservation measures, it is desirable to develop alternative energy sources and appliances for domestic use to replace fuel wood.

359. Repelita VI and After:

(iv) Agricultural intensification and diversification efforts through improved technologies will be strengthened further, partly to provide surplus to Riau and other neighboring provinces, and partly to provide raw materials for processing industries around Padang. In addition, the area will emerge as one of the country's important regional centers which provide improved seeds and seedlings of secondary and horticultural crops and impart better farming practices for other parts of Sumatra. With effective supports from the public sector, commercial farms and organized farmers' groups should attempt to market high-value fruits and vegetables to major urban markets outside Sumatra and neighboring countries.

(v) With regard to infrastructure, arterial roads serving inter-provincial and inter-region traffic must be upgraded, while investments in urban utilities must be continued in the area's three cities and Padang. In conjunction, watersheds management and flood control measures should be continued to ensure a long-term sustainable growth of agriculture and rural industry and commerce.



MAP 11.

Existing Land Use of Minang Highlands IDEP

Table 56. Minang Highlands IDEP Project List

P-6	Minang Highlands														
															Pub Inv
Code	Project	REPELITA V					REPELITA VI					REPELITA VII & VIII	High	GFS	Rep. V
		89	90	91	92	93	94	95	96	97	98	1999 - 2008	Priority		(US$M)
	I. Productive Sectors														
A- 1	Dev. of Appropriate Agri. Mechanization	-	++	++	++	++							0		2.8
A-38	Wetland Food Crop Intensif. and Diversif.	-	++	++	++	++							0		1.6
A-40	Paddy Post-Harvest Technology Development						-	++	++						
A-41	Higher-Altitude Horticulture Development						++	++	++	++	++				
A-42	Market Infra. Dev. for Horticultural Crops								--	++	++	++			
A-44	Smallholder Coconut Development		+	++	++	++	++	+							
A-50	Lake Fishery Development						--	--	++	++	++				
A-51	Freshwater Fish Culture Rehabilitation						-+	++	++	++					
D- 4	Dev. of Marketable Handicraft Products		-	+	++	+							0	0*	0.4
D-52	Agro-Industries		-	++	++	++	++						0	0*	
D-54	Wood/Rattan Processing Industries		-	++	++	++	++								
D-58	Craft Industries		-	++	++	++	++								
D-63	Light Engineering Industries		-	++	++	++	++						0		
H-12	Reforestation and Agro-Forestry System Dev.		--	--	++	++	++								
I- 9	Minang Highlands Tourism Development	-	--	++	++	++									
	II. Infrastructural Sectors														
B- 3	Irrigation OMR	-	--	++	++	++	++	++	++	++	++		0		10.0
B-55	Natural Disaster Prevention		--	--	++	++	++	++	++	++	++				
B-56	Padang Flood Control		++	++	++	++	++								
B-57	Anai Basin Overall Development	--	-+	++	++	++	++	++					0		50.0
D- 7	Industrial Estate/Area (Bukittinggi)						--	++	++						
D- 7	Industrial Estate/Area (Padang)									-+	++				
E- 1	Fuel Efficient Stove Dissemination	--	--	++	++	++	++	++	++	++	++	++++++++++++	0	0*	1.0
E- 2	Rural Electrification	++	++	++	++	++	++	++	++	++	++	++++++++++++	0	0*	2.0
E-27	Ombilin Coal-Fired Power Plant	++	++	++	++	++				--	--	++++++++++++	0		183.2
E-28	Singkarak Hydropower					++	++	++	++	++					
E-29	Batang Bayang Hydropower No. 1 and 2						--	--	++	++	++				
F- 1	Arterial Road Upgrading		--	-	++	++	++						0	0*	50.0
F-39	Bukittinggi-Pekanbaru Road Betterment				++	++	+						0		20.0
F-40	Bukittinggi Bypass Road							++	++						
F-42	Padang-Sawahlunto Road Betterment							++	++						
F-45	Sawahlunto-Padang-Telukbayur Railway Imp.		--	++	++	++	++						0		30.0
F-49	Telukbayur Port Expansion				++	++	++								
F-50	Padang Airport Improvement			--	++	++	++						0		40.0
G- 2	Medan-Padang Digital Microwave System											++++++++			
G-29	Kotamadya Local Telephone Network Expansion	++	++	++	++	++							0		15.0
G-31	TDMA Satellite Link Expansion						++	++	++	++	++				
G-32	100 Small Earth Stations Provision											++++++++			
G-33	Coin Telephone Sets Provision	++	++	++	++	++	++	++	++	++	++	++++++++++++	0		5.0
G-35	Telephone Outside Plant Maintenance Center					++	++						0	0*	1.6
G-37	Long Term Plan for Local Telecom. Network			--	--								0	0*	0.8
J- 4	Urban and Rural Water Supply Program II						-	--	++	++	++				
K- 3	Secondary Cities Urban Development	-	--	++	++	++	++	++					0		5.0
K- 9	Urban Drainage, Solid Waste and Sanitation						--	-+	++	++					
K-11	Urban Road Improvement							--	-+	++	++				
	III. Others														
L- 2	Rural Technology Extension Program	-	--	++	++	++	++	++	++	++	++	++++++++++++			
P-12	Production and Marketing Study		--										0	0*	1.0
														Total	419.4

Notes: 1. ---- denotes "study," ++++ "Implementation."
2. On-going projects are excluded from the list.
3. "GFS" stands for Guideline for Study. An asterisk (*) indicates that this Guideline for Study is common to several IDEPs.
4. Public investment is for Repelita V. The figures are subject to further study.

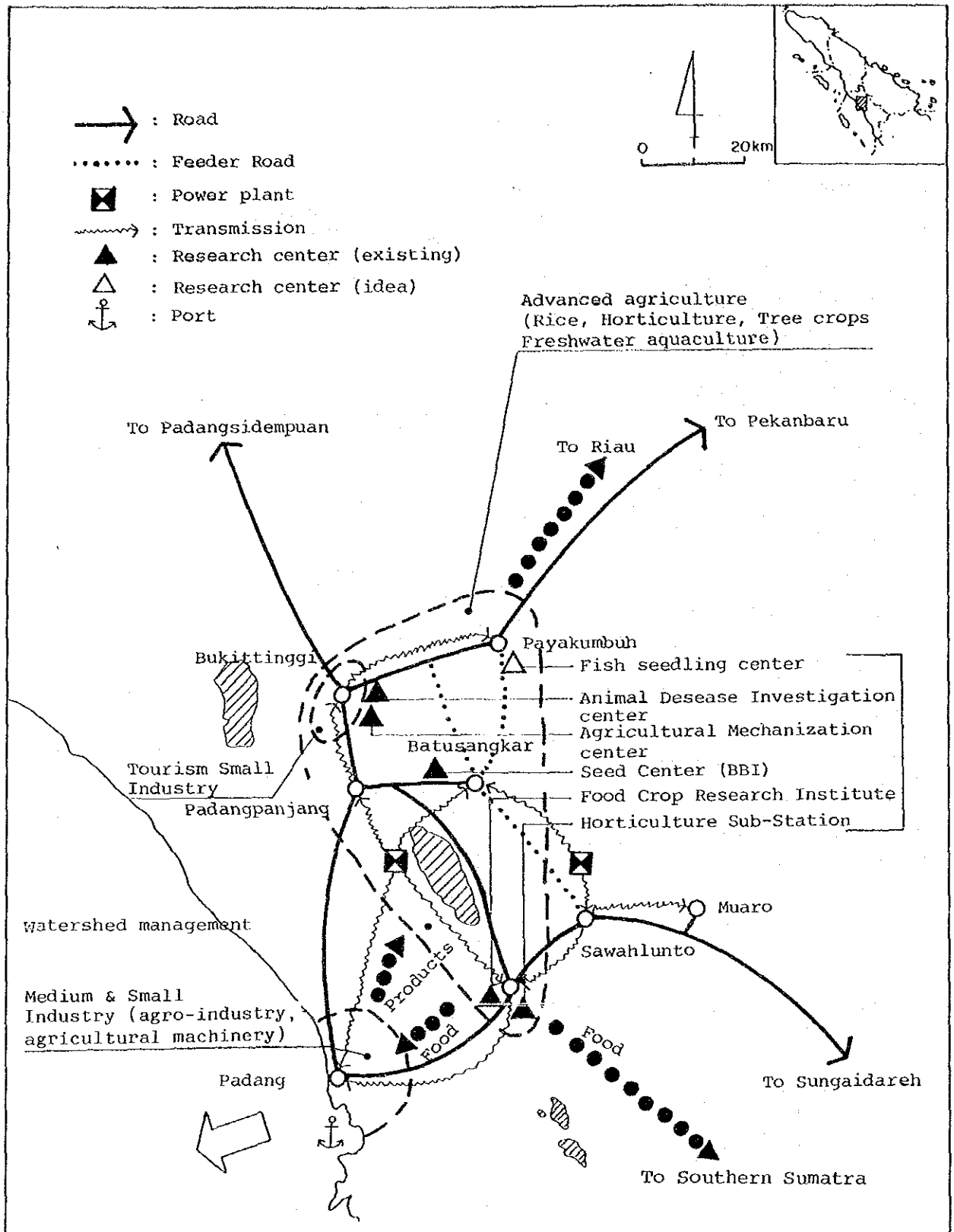


Figure 40. Minang Highlands IDEP Development Scheme

G. South Sijunjung Integrated Development Program

1. Background

360. West Sumatra Province is roughly divided into the central north-south axis of Padang - Minang Highlands which is well-connected to Pekanbaru in Riau Province, on the one hand, and the outlying areas of the province on both sides of this axis, on the other. In contrast to the central axis area where intensive agriculture, major mining and industrial establishments and modern service industries are concentrated, the outlying areas are sparsely populated and underdeveloped.

361. Sawahlunto/Sijunjung Regency, where the South Sijunjung IDEP is located, is one of the four relatively sparsely populated and underdeveloped regencies. Partly for this reason, the four regencies have so far absorbed the bulk of officially sponsored transmigrants since mid-1950s.

362. The regency's population density of 484 persons/km^2 of usable land is the second lowest after Pasaman Regency (455 persons), and considerably lower than the density of 688 persons in the central axis area. This indicates the existence of large development potentials in the regency, chiefly for agriculture and agriculture-based activities.

363. In addition to the extensive agricultural potentials, the Trans-Sumatra Highway which traverses the Regency length-wise constitutes a definite advantage, by giving much easier access to wider markets for whatever commodities to be grown and/or produced in the regency. In the long run, the regency, or more specifically its southern portion, could grow into the central locus of the secondary north-south axis, when linked to the southeastern parts of Solok and Pesisir Selatan Regencies.

2. Program Area

2.1. Area and Population

364. The program area consists of three contiguous kecamatans of Tanjung Gadang, Pulau Punjung and Koto Baru located in the southwestern part of Sawahlunto/ Sijunjung Regency. It has an aggregated area of 4,260 km^2 and the population of 143,000 in 1987, respectively accounting for 67% and 49% of the regency total, and 10% and 4% of the provincial total. In the demographic framework of the present study, the population of the program area is estimated to increase to 214,000 by 2008. The density of 34 persons/km^2 is about one half of the remaining six kecamatans of the same regency. Since mid-1950s, some 10,000 families have been settled in the twelve transmigration sites in Pulau Punjung and Koto Baru. These transmigrants account for roughly one third of the present population.

365. The area's population is distributed in 130 communities (desa) which are grouped into 24 administrative units(nagari). These communities are concentrated, although loosely, in the northeastern parts of Koto Baru and Pulau Punjung Kecamatans, along the Trans-Sumatra Highway and the national roads to Jambi and Riau and the Batang Hari River system. Tanjung Gadang Kecamatan appears to be divided into two spheres: one sphere consisting of communities around the junction of the Trans-Sumatra Highway and the national road connecting to Taluk Kuantan in Riau and more or less contiguous to the Pulau Punjung-Koto Baru area, and the other centering around the town of Tanjung Gadang

which is more a part of the relatively populated area in the western part of the regency (Figure 41). Three kecamatan administrative centers (Tanjung Gadang, Sungai Dareh, and Koto Baru) and junctions on the Highway and the national roads are beginning to attract some concentrations of population partly to service through traffic from outside, urban functions in the program area are yet weakly developed and diffusely structured.

2.2. Natural Conditions

366. The general climate of the program area is humid tropical, with annual rainfalls ranging from 2,000 mm to over 3,000 mm. During the period from June to September, monthly precipitation sometimes falls below 100 mm.

367. The terrains in the program area are mostly undulating rolling plains with hillocky configurations in some locations. Batang Hari is the major river system and its tributaries are utilized for irrigation.

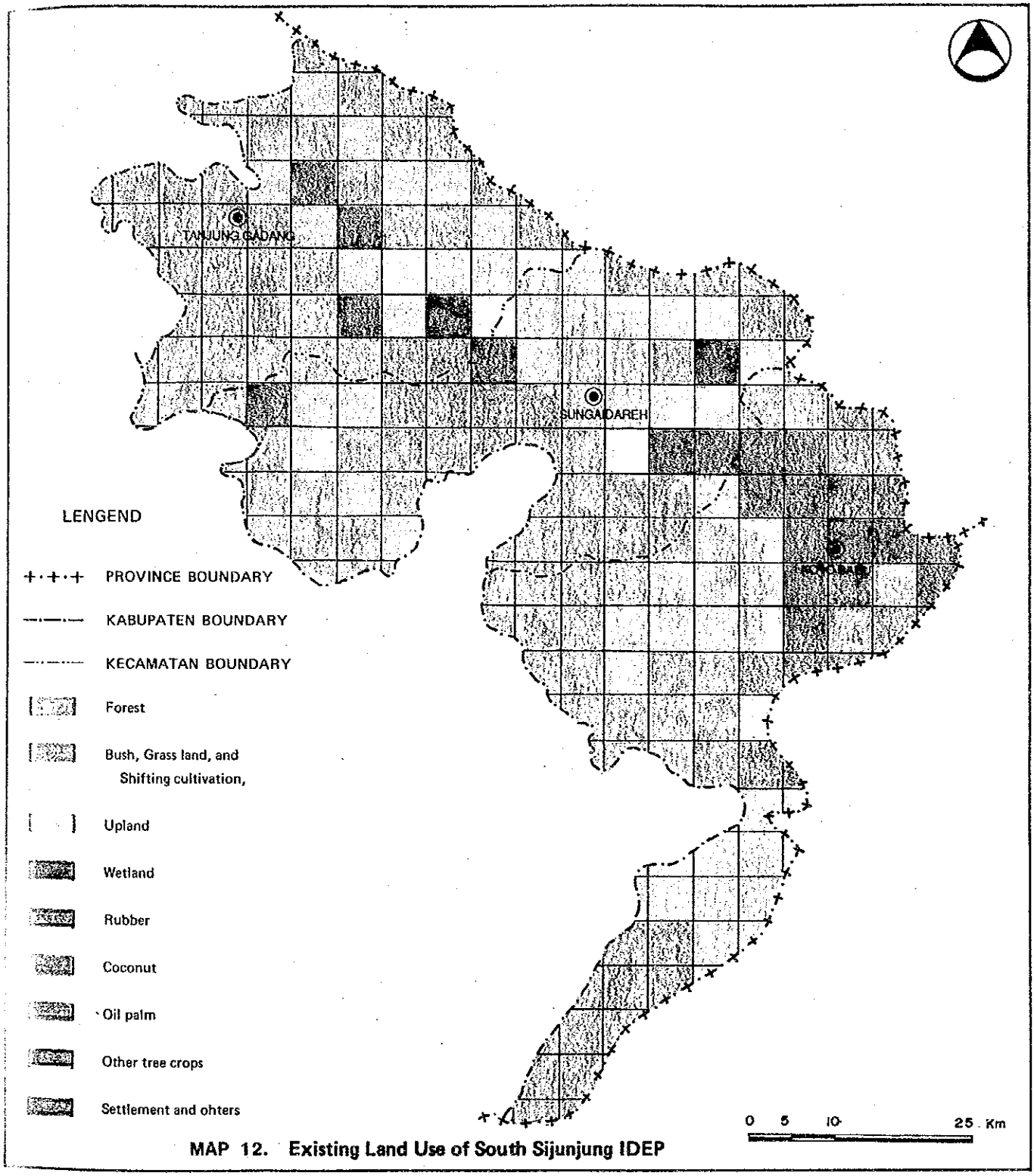
368. The major soil type is red-yellow podsol with occasional latosol and lithosol (especially in Kecamatan Pulau Punjung) and patches of alluvial soils found along the river system.

2.3. Land Use

369. According to the 1987 forestry statistics of the province, some 500,000 ha, or 80%, of the total area of Sawahlunto/Sijunjung Regency is estimated as forests of various classifications, while the remaining area, about 130,000 ha, are used for various purposes (no break-down is available for the program area). According to the 1987 agricultural land use survey, on the other hand, Sawahlunto/Sijunjung Regency has a total agricultural land area of 135,000 ha (excluding communal and private forests and unused swamps), which roughly corresponds to the above figure. The composition of the land use is as follows.

Wetland paddy area	16,000
(of which irrigated)	(8,100)
Permanent dryland agriculture (tree and annual crops)	31,900
Shifting cultivation	11,200
Large-scale estate area	42,900
Home garden area	20,500
Fallow, grassland and ponds	13,200
Total	135,700

370. Of the above, the program area has 6,800 ha, or 43%, of wetland paddy area and the entire large-scale estates area (no breakdown is available for other categories of agricultural land). One of the characteristics of wetland in the program area is its higher percentage of irrigation, nearly 60%, compared with the rest of the regency (45%). Moreover, the so-called technical irrigation systems of the regency are located only in the program area. This is because of the on-going World Bank-financed irrigation projects at two transmigration sites (Sitiung I and II). The wetland paddy cropping intensity of 141% (1987) in the program area is yet only marginally higher than in the rest of the regency (140%), and significantly lower than the provincial average of 153% (the provincial percentage of irrigation in wetland is 72%). The situation will no doubt change after the completion of the irrigation projects.



MAP 12. Existing Land Use of South Sijunjung IDEP

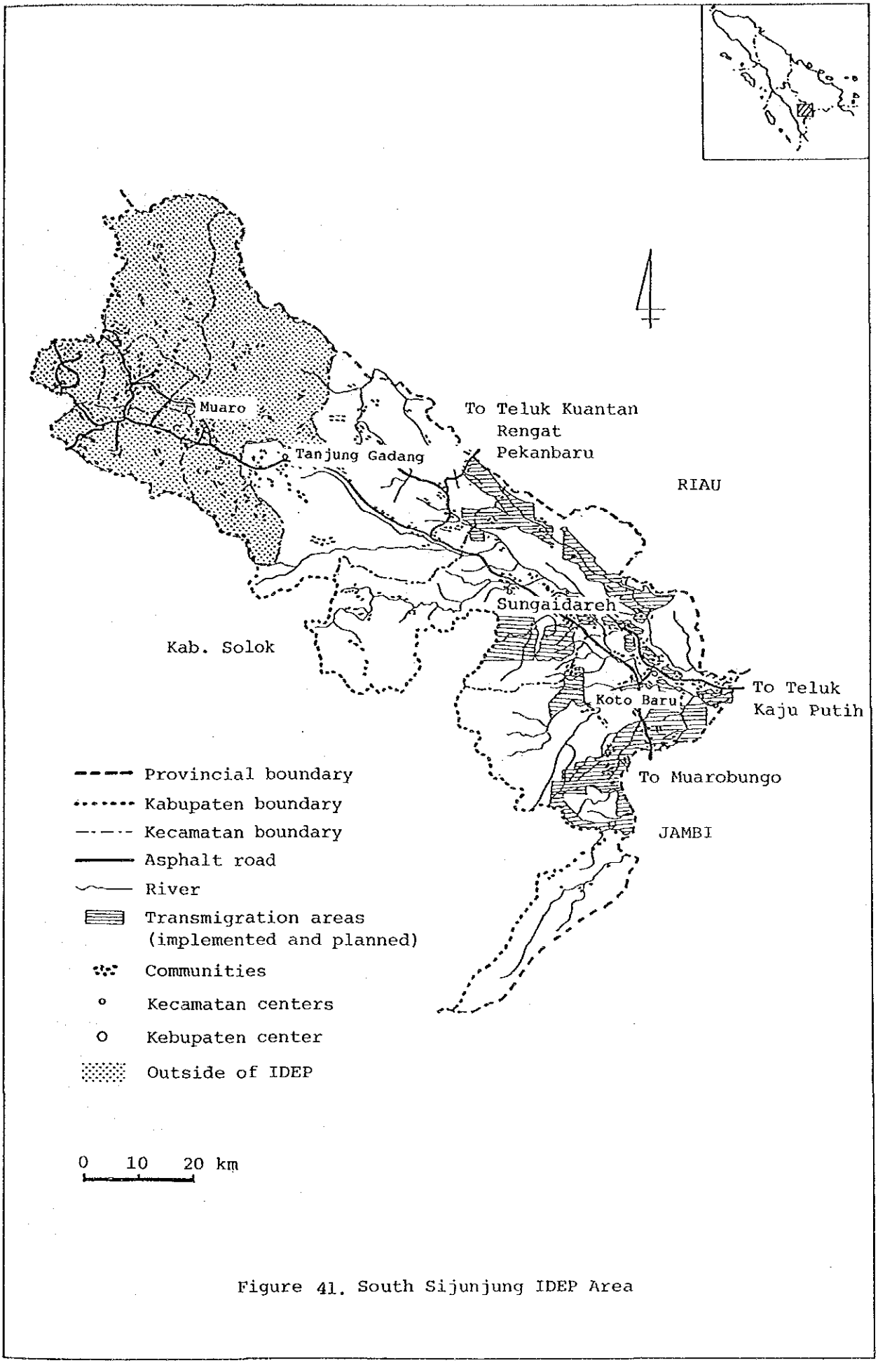


Figure 41. South Sijunjung IDEP Area

2.4. Major Productive Sectors

(1) Agriculture

371. Agriculture is by far the most important sector in the economy of the program area. Sawahlunto/Sijunjung Regency as a whole produced roughly 100,000 tons of paddy in 1987. Assuming annual per capita consumption of 140 kg, the regency is estimated to have had a surplus of over 20,000 tons in milled rice. As shown on Table 56, the program area produced 55,500 tons of paddy in the same year, and under the same assumption, is estimated to have had a surplus of roughly 10,000 tons in milled rice. However, 30% of the paddy output in the program area was from dryland (Table 57).

372. Major characteristics of food crops production in the program area vis-a-vis the rest of the regency derive from the much greater importance of dryland farming, which is related to the existence of transmigration projects. The program area accounts for nearly all of dryland paddy production of the regency and from 80% to 90% of the outputs of six major palawija crops (maize, soybean, peanut, mung bean, cassava and sweet potato). Especially notable are soybean and cassava, and their harvested areas in the program area account for 45% and 30% respectively of the provincial total. The expansion of soybean was because of the Javanese transmigrants, and that of cassava came from the recent establishment of a tapioca factory near the town of Koto Baru.

373. One of the characteristics of the tree/estate crop subsector in the program area is the predominance of rubber among smallholders. The planted area of about 19,000 ha in the area accounts for 75% of the regency total and 30% of the provincial total. 10,000 ha belongs to the recently completed West Germany-assisted replanting scheme at Abai Siat. Other smallholder estate crops are of minor importance and less diversified than in other parts of the regency or the province. The combined area of coconut, coffee, clove and cinnamon totals only about 4,000 ha, which accounts for 42% of the regency total, or a mere 3% of the provincial total.

374. Compared with Riau and North Sumatra Provinces, the presence of large-scale estates is relatively small in West Sumatra, but their importance has been increasing in its sparsely populated regencies. In Sawahlunto/Sijunjung Regency, seven private investments have obtained concessions involving 68,000 ha and are at various stages of development or under processing, and additional six investments (30,000 ha) have been applied or processed. Practically all of these investments are located in the program area. Of the total area planned, at present, for planting (some 73,300 ha), about 70% are meant for oil palm, 23% for rubber and/or cocoa, and the remainder for coffee (1,300 ha) and soybean (1,000 ha).

375. One of the characteristics of the livestock/poultry subsector in Sawahlunto/Sijunjung Regency is its relatively larger population of large ruminants (some 63,000 heads of cattle and buffaloes). At the time of the 1983 census, the number of these ruminants per ha of the wetland area was 2.6 heads relative to the provincial average of 1.9 heads. The similar situation apparently prevails in 1987; 3.9 heads per ha compared with the provincial average of 2.3 heads, or 210 heads per thousand of population compared with 130. The same applies to goats and sheep.

Table 57. Selected Indicators of South Sijunjung 1987

	Tanjung Gadang	Pulau Punjung	Koto Baru	South Sijunjung Total	% of Total Prov.	Sawahl./ Sijunjung Total	% of Total Prov.	West Sum. Province Total
Total Area (sq. km)	1297.6	1262.9	1698.2	4258.7	10.1	6377.4	15.1	42297.3
Usable Area (sq. km)						603.9	10.2	5910.2
Population (1000)	36.7	44.4	61.7	142.7	3.7	292.5	7.6	3872.0
Density per sq. km	28.3	35.1	36.3	33.5		45.9		91.5
Wetland Rice								
Harvested Area (Ha)	3400	3907	2232	9539	2.8	22389	6.6	338906
Production (ton)	14910	15967	8551	39428	2.6	102389	6.9	1493470
Yield (ton/ha)	4.39	4.09	3.83	4.13	93.8	4.57	103.8	4.41
Dryland Rice								
Harvested Area (Ha)	25	1291	6187	7503	12.0	7667	12.3	62299
Production (ton)	61	2379	13642	16082	42.5	16767	44.3	37848
Yield (ton/ha)	2.44	1.84	2.20	2.14	352.8	2.19	360.0	0.61
Maize								
Harvested Area (Ha)	82	314	567	963	8.5	1214	10.8	11266
Production (ton)	97	401	695	1193	4.4	1514	5.5	27354
Yield (ton/ha)	1.18	1.28	1.23	1.24	51.0	1.25	51.4	2.43
Cassava								
Harvested Area (Ha)	102	280	1960	2342	29.5	2652	33.4	7945
Production (ton)	1964	5611	38367	45942	36.8	52188	41.8	124864
Yield (ton/ha)	19.25	20.04	19.58	19.62	124.8	19.68	125.2	15.72
Sweet Potato								
Harvested Area (Ha)	34	73	48	155	4.1	171	4.5	3811
Production (ton)	144	292	181	617	1.5	680	1.7	39817
Yield (ton/ha)	4.24	4.00	3.77	3.98	38.1	3.98	38.1	10.45
Soybean								
Harvested Area (Ha)	97	1843	6341	8281	45.6	9669	53.3	18156
Production (ton)	122	2715	9519	12356	50.3	14410	58.7	24565
Yield (ton/ha)	1.26	1.47	1.50	1.49	110.3	1.49	110.2	1.35
Peanut								
Harvested Area (Ha)	64	294	581	939	9.5	1142	11.5	9896
Production (ton)	75	359	691	1125	7.3	1363	8.8	15487
Yield (ton/ha)	1.17	1.22	1.19	1.20	76.6	1.19	76.3	1.56
Mungbean								
Harvested Area (Ha)	147	265	459	871	26.9	1131	35.0	3232
Production (ton)	139	274	457	870	25.1	1177	33.9	3468
Yield (ton/ha)	0.95	1.03	1.00	1.00	93.1	1.04	97.0	1.07
Rubber								
Planted Area (Ha)	2970	2943	13261	19174	30.1	25676	40.3	63753
Production (ton)	1850	1834	8262	11946	32.7	15996	43.8	36502
Coconut								
Planted Area (Ha)	272	489	709	1470	2.0	3918	5.3	74149
Production (ton)	176	315	458	949	1.5	2535	4.1	62354
Livestock Population								
Cattle	2267	4736	5871	12874	3.8	27374	8.1	336340
Buffalo	3649	9161	5161	17971	10.2	38160	21.7	175532
Goat/sheep	6070	5220	3754	15044	7.0	57941	27.1	213872

Sources: For kecamatan and kabupaten figures, Kantor Statistik Kabupaten Sawahlunto/Sijunjung, Sawahlunto/Sijunjung Dalam Angka 1987
For provincial figures, Kantor Statistik, Prov. Sumatera Barat, Sumatera Barat Dalam Angka 1987

376. Of the total forest areas in Sawahlunto/Sijunjung Regency, roughly 35% (176,000 ha) are reserve and protection forests. Of the remaining productive forests (331,000 ha), a little over 70,000 ha are classified as convertible forests. In 1988/89, there are four forestry concessions (HPH) in the regency (reduced from six in the previous year).

377. Log production of the regency accounted for a little over 30% of the provincial output in 1987/88. The regency's log output is slightly reduced in 1988/89 at around 143,000 m3, and it is estimated that 50% is sold as logs. The production of sawn timber at four HPH sawmills and eight non-HPH sawmills totals 32,000 m3 in 1988/89.

(2) Industry and Mining

378. Medium- and large-scale industries number only 11 in Sawahlunto/Sijunjung Regency in 1987, and 9 of them are located within the program area. All of the nine establishments are agro-based industries: seven HPH sawmills (apparently reduced to four by mid 1989), a tapioca factory (cap. 80 tons/day), and a crumb rubber factory (cap. 6,000 tons/year). Excluding the rubber factory which has been out of operation in the last couple of years, these industries employ about 1,500 persons. In addition, a palm oil mill (cap. 30 tons/hour) has recently begun its experimental operation at a private oil palm estate in Kecamatan Koto Baru.

379. In addition to the above, 648 small and home industries are operating in the regency, with combined employment of 3,400 workers and output of Rp. 2.8 billion (5 workers and Rp. 4.3 million per establishment). Of these industries, 170 establishments employing 833 workers are located in the program area. 42% of the establishments are in rice milling and other types of food processing, 36% in chemical and wood processing and 34% in metal working and electrical repair.

380. Only the coal deposit at Sinamar close to the border with Jambi is known to have some development possibility in the program area. The geological survey was conducted in mid-1970s with a tentatively estimated deposit of 87 million tons.

2.5. Major Infrastructural Sectors

(1) Transportation and Telecommunication

381. Sawahlunto/Sijunjung Regency has 326 km of national and provincial roads and 641 km of regency roads, of which respectively 65% and 50% are found in the program area. The program area's national and provincial road density of 1,480 m per thousand population and 50m per km2 compares favorably with the provincial figures of 310m and 43m. This is primarily because of the Trans-Sumatra Highway which traverses the regency length-wise. Likewise, the regency road density of 2.5 km per community (desa) in the program area compares well with the provincial average (1.7 km), primarily reflecting the extensive rural road development in and around transmigration areas.

382. There are four telephone exchanges, each equipped with 200 lines, in Sawahlunto/Sijunjung Regency. One of them is located at Sungai Dareh in the program area, but as of 1987 only 43 lines are actually in use.

(2) Energy and Water Supply

383. Electricity in the area is supplied from isolated diesel plants owned by PLN and non-PLN entities. 90% of the total users(about 24,600) are serviced by the latter.

384. According to the provincial statistics, there are some 2,700 users benefiting from water supply systems in Sawahlunto/Sijunjung Regency. But a little over one third of these users are in the municipality of Sawahlunto, and the program area is apparently not well-serviced by public systems.

3. Development Potentials and Constraints

385. Major development potentials in the program area primarily derive from the availability of under-utilized or unutilized land for agricultural development and the locational advantage, compared with other underdeveloped areas of the province, which is mainly provided by good transportation links to major urban centers within and without the province.

386. Relatively poor soil conditions might limit the types of agriculture to be promoted, but aided by abundant rainfalls and the existence of the Batang Hari river system, there are large land potentials to be harnessed for agricultural intensification and diversification. As a corollary to agricultural potentials, there are possibilities of agro-based or agriculture-related industrial development.

387. As mentioned earlier, the program area is already in the process of undergoing an important change in the sphere of agriculture (transmigration and private estate development). In the medium and the long term, it is important to make most of the expected impacts from these individual projects/programs as a coherent whole and ensure their multiplier effects toward accelerating growth. For this purpose, it will be important to plan ahead the steps for upgrading the current weak urban structure and inadequate provision of basic economic and social infrastructure as well as stimulating the growth of productive sectors.

4. Development Goals and Strategies

4.1. Development Goals

388. In line with the national policy objectives, the development goals for the program area are (i) to become one of the agricultural centers which would contribute to the maintenance of national food self-sufficiency and agriculture-based export expansion, (ii) to generate increased income and diversified employment opportunities through the growth of industrial and service establishments, and (iii) to become one of the important secondary provincial centers, especially in relation to the underdeveloped southern parts of Kabupaten Solok, and thereby contribute to the correction of regional imbalance in the province.

4.2. Development Strategy

389. The strategy for the productive sectors is in taking advantage of the area's good transportation linkage by expanding the market-oriented agricultural development, partly in integration with appropriate agro-processing industries. Development possibilities in the productive sectors are (i) intensive wetland paddy production, (i) diversification of food production including livestock, (iii)

tree/estate crop development, (iv) promotion of local-resource-based industries.

390. Two of the major possibilities mentioned above are now in the more or less set course of development; namely, intensive wetland paddy production and large-scale estate development. With regard to the former, the on-going irrigation development at Sitiung I and II will before long increase the area under technical systems from 1,200 ha to 12,000 ha. The rice surplus of the program area is thus assured to increase in the short term by expanding the coverage of the intensification programs. In the medium term, it may become necessary to identify target markets and accordingly improve the post-harvest technology. The future expansion of irrigation and/or wetland paddy production need be studied similarly in relation to the prospects of targeted markets.

391. As already mentioned, 13 private-sector investments are now being implemented or awaiting final authorization. When completed, these estates will boost the provincial GDP and create, roughly speaking, over 10,000 permanent employment as well as providing seasonal employment opportunities for the local population. Although only one of them takes the NES-type oil palm development, their new processing facilities could become marketing outlets for local smallholder growers as well. Especially in relation to rubber, they could offer better incentives for the smallholders' efforts at quality and productivity improvement by organizing farmers around individual estates.

392. In addition to agro-processing facilities to be established at planned large-scale estates, there is a good example of a tapioca factory which has stimulated the production of cassava in the program area. Such private investments should be encouraged further in order to promote the area's agricultural diversification, especially to boost the palawija and horticultural production, and thereby to amplify the benefits of industrial agglomeration.

393. With regard to infrastructural development, the program area does not apparently have intrinsic needs for sizable transportation development in the short term. In the medium term, the expected production of oil palm estates, roughly estimated to reach some 250,000 tons of crude palm oil and 70,000 tons of palm kernels at full production, will have to be considered in planning the provincial priorities of road network development and some appropriate expansion of port facilities. In addition, the improvement of road connection toward the southern part of Kabupaten Solok will be needed in order to establish the program area as the gateway of the secondary north-south axis of the province.

394. The program area's infrastructural needs are more in energy/power and telecommunication sectors. Because of the relatively small population, the initial phase of local electrification could be started by the development of local energy source, rather than the extension of the existing high-voltage power system in the province(the distance of more than 100 km is needed for extension). One possibility is the construction of a mini-hydropower plant, and one potential site is identified for this purpose by the Ministry of Cooperatives, on Pangian River, a tributary of the Batang Hari located in Kabupaten Solok.

395. In the medium and/or long term, the electrification in the program area must be planned and developed as integral part of an articulate urban system, which would support the expected

diversification of economic activity, notably, the growth of agro-processing industries and the growing population in urban service centers which would be stimulated by the establishment of 13 private estates in the program area.

396. The development of telecommunication will be necessary not simply as civil minimum requirements for the growing population in the area's service centers, but also as ready access to market information outside the program area and the province which will benefit local small producers. The rough picture of development prospects in South Sijunjung toward the year 2008 is shown in Figure 42.

5. Identified Projects and Phasing

397. Excluding the afore-mentioned two development possibilities in agriculture for which the necessary initial steps are being taken, Table 58 shows the list of projects which are considered necessary in order to activate the available resource potentials.

6. Selection of Priority Projects with Reasoning

398. From the project list above, the following projects are selected as priority projects.

(1) Dryland Farming Development

399. The existence of some 7,500 ha under dryland paddy implies a sizable presence of farmers who do not have enough wetland for securing home consumption, although the program area as a whole is estimated to have a surplus. As an effective alternative to wetland development, it is necessary to develop viable dryland farming, by taking note of such factors as technical possibilities (selection of suitable crops and/or varieties and environmentally sustainable cropping patterns) and prospects of wider markets and local processing. In the beginning, oil seeds (soybean and peanut) appear to be promising, but along with livestock development, forage crops and/or feed grains could be incorporated in the cropping system.

(2) Livestock Development

400. Considering the availability of extensive unutilized or underutilized dryland and its relatively poor soil conditions, semi-extensive or extensive animal husbandry (cattle and goats) can be introduced in the dryland farming areas of the program area. In addition to promoting joint grazing on unutilized communal lands, some parts of convertible productive forests can be made available after logging for medium-scale commercial cattle ranching with silvi-pasture development. For this purpose, it would be first necessary to establish a pilot ranch, both for development of improved livestock management and for training extension workers and prospective livestock farmers.

(3) Agro-processing Industries

401. Industrial development depends on the initiatives of private investors, and the public sector's role is to promote and encourage their entrepreneurship. The immediate possibility is the local production of syrup from cassava starch, which is manufactured by the tapioca factory. Syrup can be used for fruit and vegetable canning and other food preparations, which suggests new expanding business opportunities. Other possibilities are fruit and vegetable juice, sweets and snacks, meat and leather products, animal feeds, vegetable oils and so forth. The promotion of such industries in the program

area need be coordinated with the prospective production of food and horticultural crops.

Table 58. South Sijunjung IDEP Project List

P-7	South Sijunjung														
Code	Project	REPELITA V					REPELITA VI					REPELITA VII & VIII	High	GFS	Pub Inv Rep. V
		89	90	91	92	93	94	95	96	97	98	1999 - 2008	Priority		(US$M)
	I. Productive Sectors														
A- 2	Tropical Fruit Development						-	-+	++	++	++	++++++++++++			
A-39	Dryland Farming Development			-+	++	++	++	++	++	++	++	++++++++++++	0	0	1.0
A-40	Paddy Post-Harvest Technology Development						-	++	++	++	++				
A-43	Livestock Development (beef cattle)			-+	++	++	++	++	++	++	++	++++++++++++	0	0	3.0
A-45	Smallholder Rubber Development						-	++	++	++	++	++++++++++++			
C- 5	Sinamar Coal Resources Development			--	--	++	++	++	++	++	++		0		1.6
D-52	Agro-Industries			-	-+	++	++	++	++	++	++	++++++++++++	0	0*	
D-56	Livestock-Related Industries							-+	++	++	++	++++++++++++			
D-63	Light Engineering Industries									-+	++	++++++++++++			
	II. Infrastructural Sectors														
B-61	Sungaidareh Irrigation									--	++	++++++			
E- 1	Fuel Efficient Stove Dissemination	--	--	++	++	++	++	++	++	++	++	++++++++++++	0	0*	1.0
E- 2	Rural Electrification	++	++	++	++	++	++	++	++	++	++	++++++++++++	0	0*	2.0
E-26	Mini-Hydropower					--	++	++	++						
F- 1	Arterial Road Upgrading		--	-	++	++	++						0	0*	5.0
F- 2	Road Disaster Prevention		--	-	++	++	++						0	0*	5.0
F-44	Solok-Bangko Road Betterment										++	+++			
F-53	Pekanbaru-Sawahlunto Road Betterment								++	++					
G- 4	Introduction of Rural Telecommunications		--	-+	++	++	++	++					0	0*	2.0
G-32	100 Small Earth Stations Provision											++++++++			
G-34	Coin Telephone Sets Provision						++	++	++	++	++				
K- 3	Secondary Cities Urban Development			-	--	++	++	++	++	++	++				
	III. Others														
P-12	Production and Marketing Study		--										0	0*	1.0
														Total	21.6

Notes: 1. ---- denotes "study," ++++ "implementation."
2. On-going projects are excluded from the list.
3. "GFS" stands for Guideline for Study. An asterisk (*) indicates that this Guideline for Study is common to several IDEPs.
4. Public investment is for Repelita V. The figures are subject to further study.

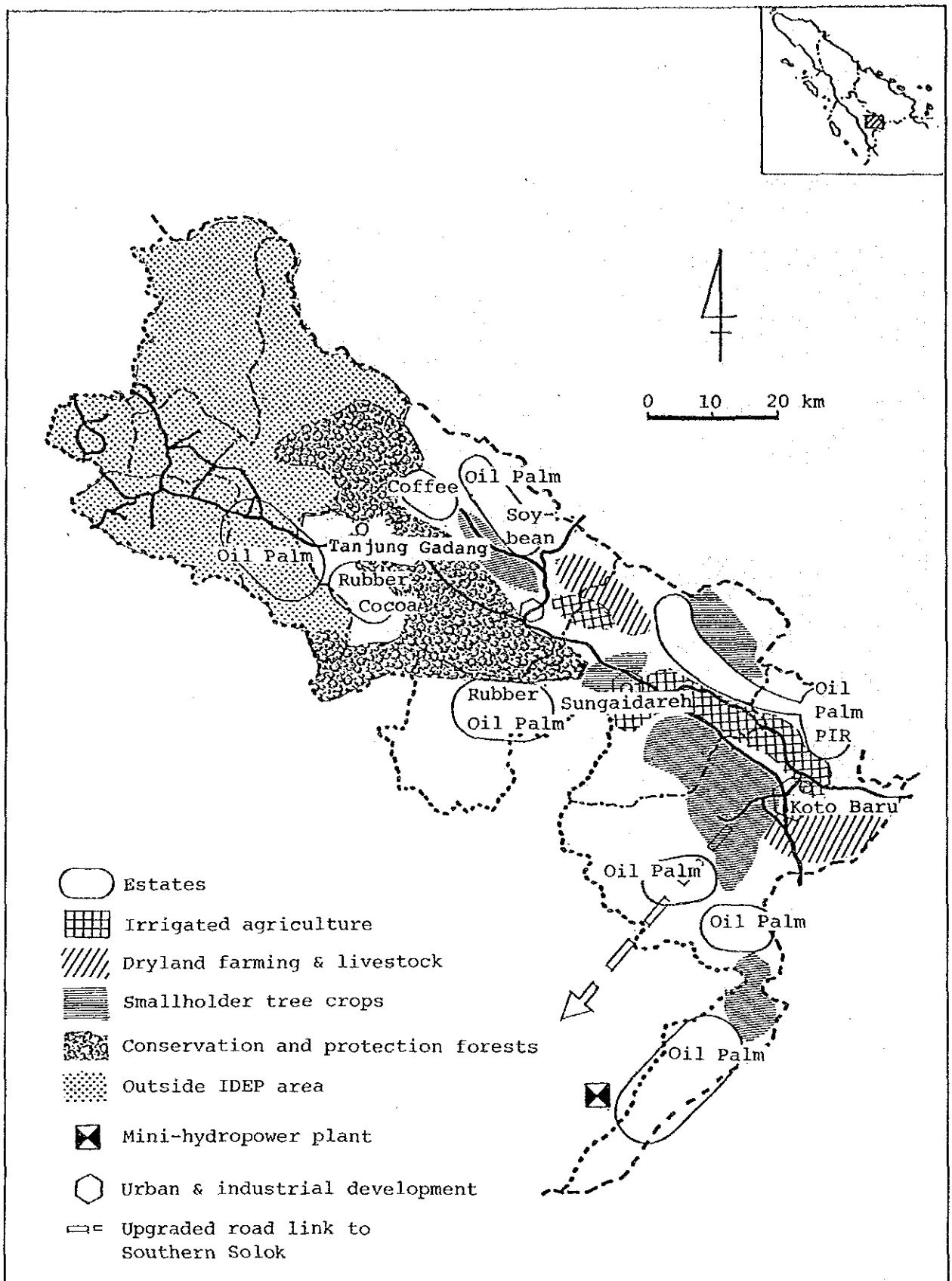


Figure 42. South Sijunjung IDEP Development Scheme

H. Mentawai Islands Integrated Development Program

1. Background

402. Mentawai islands are often said to be the weakest part of West Sumatra, as these islands have long been isolated from the mainland. Full-fledged modernization programs for the islands, as a matter of fact, have just begun in the middle of the 20th century with the independence of the nation.

403. Living standard of the islanders, especially in money term, is lower than that of mainland of West Sumatra with some people still living in primitive condition. But it is greatly possible to enhance the people's living standard to some extent, should appropriate initiatives by the government be taken. But transportation is the most critical issues here; only one time flight a week to the island of Sipora is serviced from the mainland and same frequent of ship services are conducted between three major islands(Siberut,Sipora and North Pagai) and mainland in separated manner. Besides the above, there is no intra island transportation network other than rivers, and animal trails. Transportation seems to be most urgent issues for the better life of islanders.

404. The islands are vast with the area of 6,746km^2 and are endowed with a variety of flora and fauna. The population of the island are estimated at some 43 thousand with subtle rate of population increase since the independence of the nation.

2. Program Area

405. Mentawai islands, as an administrative zone, belong to Kabupaten Padang Pariaman of West Sumatra. The islands consist of four major islands, namely Siberut, Sipora, North Pagai and South Pagai as shown in Figure 43. The islands are administratively divided into four kecamatans as shown in the same map. Profile of each kecamatan is shown in Tables 59 to 61.

3. Development Potentials and Constraints

406. As mentioned before, the islands have vast area with small number of population living on them. Some 90% of the area is covered by dense forests. Most of the towns and villages here have been developed along the coast line which in many cases are unaccessable each other by land transportation. Most of the islanders are leading a self-reliant life in which sagu, potato, nuts and fruits are staple foods. Major resources for cash income are clove, fruits and fish, except for timber products which are exclusively managed by outsiders of the islands. For all the vast land and rich natural resources endowed with, the islands are far behind the progressive stage of development. This is mainly due to poor provision of transportation services and lack of information system. Poor facilities of above are holding the production level of existing agriculture and fishery low as well as social activities of islands. It is not exaggeration to say that most of the social activities, such as education, medical service and utility supply, are constrained by the poor transportation and

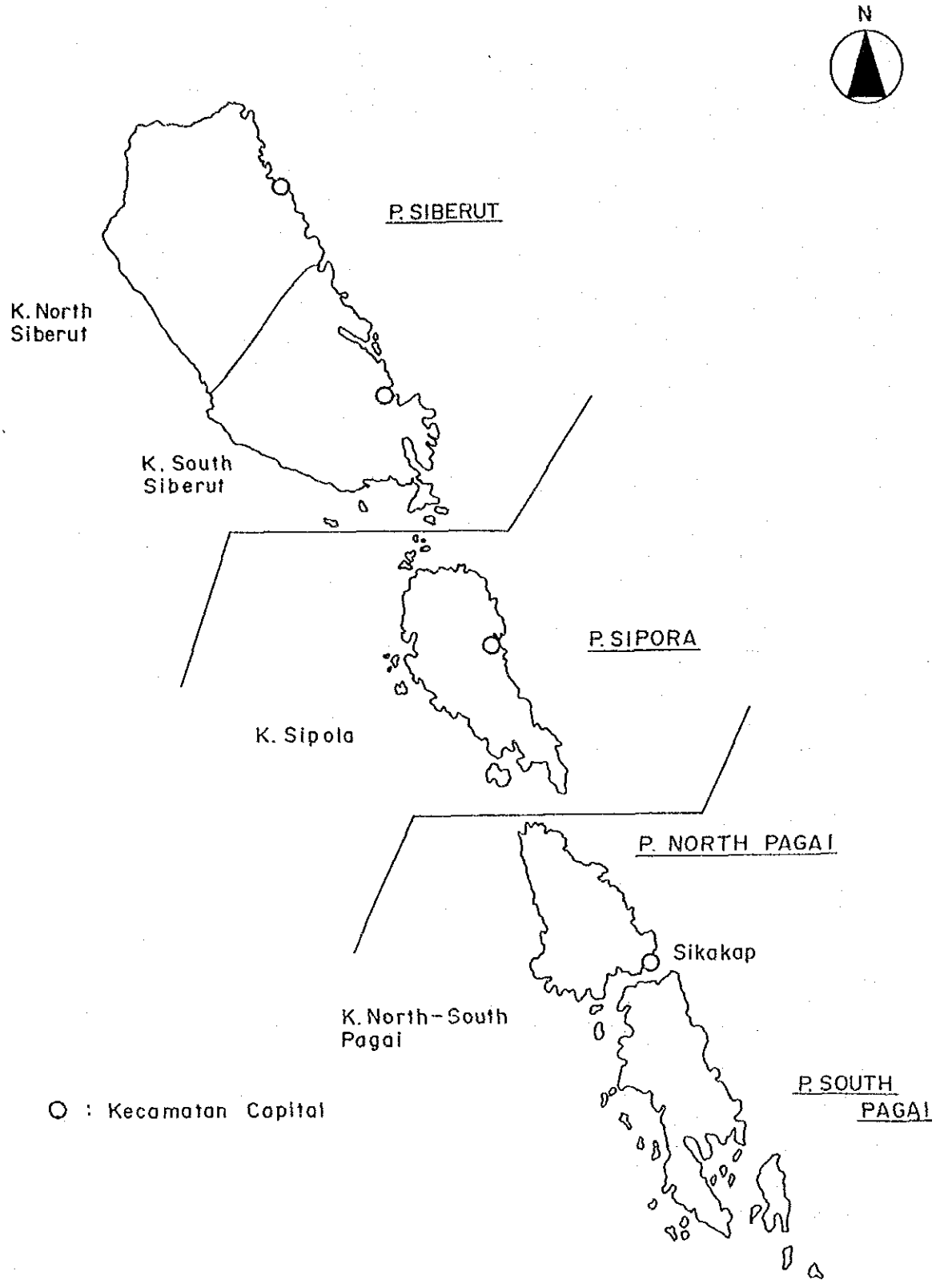
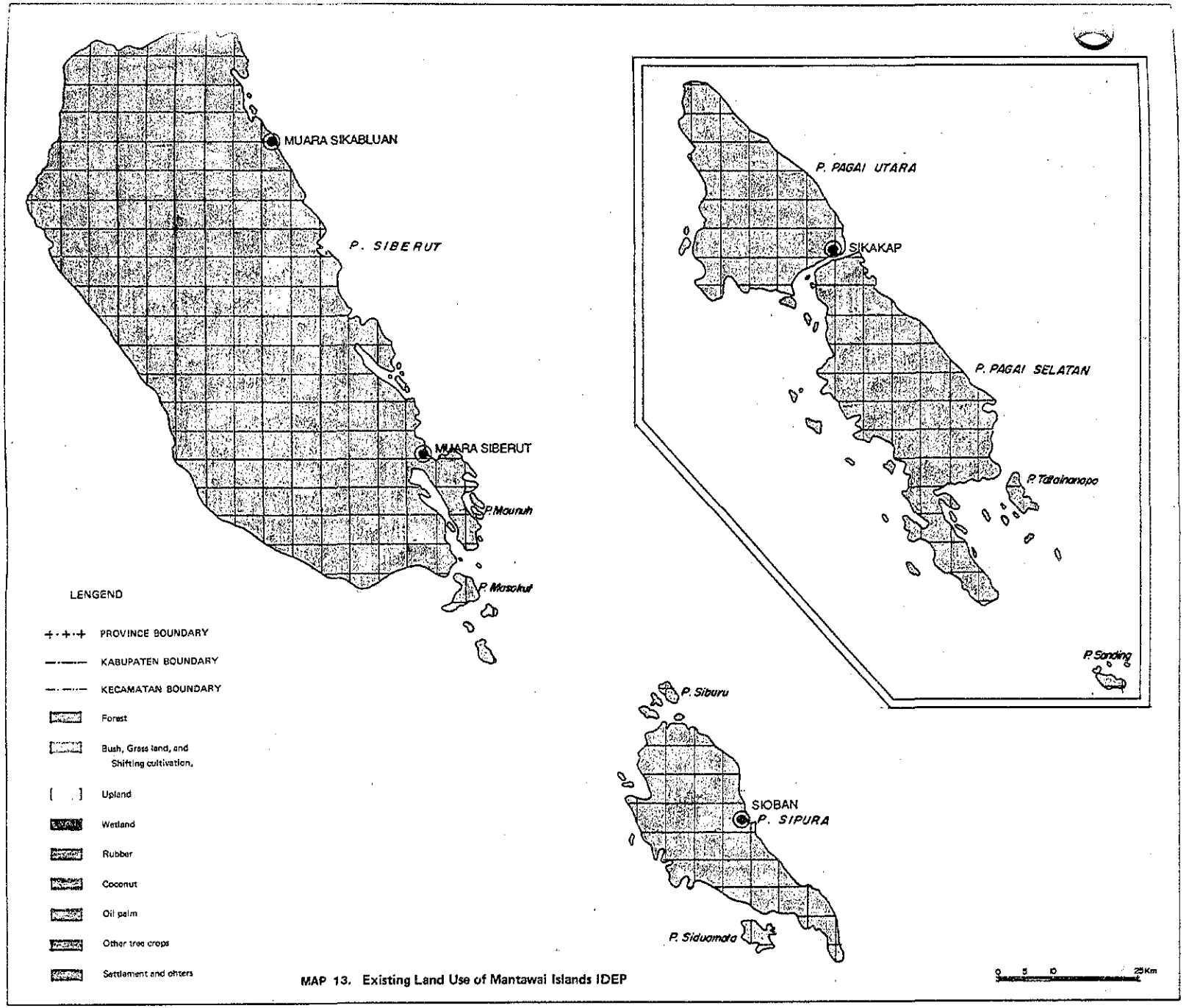


Figure 43. Program Area of Mentawai Islands IDEP



MAP 13. Existing Land Use of Mantawai Islands IDEP

Table 59. Area, Population and Population Density, 1987

Kecamatan	Capital	Area (km^2)	Population	Population Density (Persons/km^2)	Number of Desa	Number of Dusuns
North Siberut	Muala Sikabluan	2,103	10,255	4.9	10	30
South Siberut	Muala Siberut	1,994	9,917	5.0	10	25
Sipora	Sioban	916	8,755	9.6	10	24
North-South Pagai	Sikakap	1,733	14,602	8.4	10	60
Total	---	6,746	43,529	6.5	40	139

Source: Padang Pariaman Dalam Angka (1987)

Table 60. Land Suitability

(unit: km^2)

(A)

Classification	Dryland Arable	Wetland Arable	Pasture	Rubber	Oil Palm	Coconut
Suitable	530	490	55	545	622	341
Unsuitable	5,501	5,501	4,931	4,441	4,155	4,250

(B)

Classification	Coffee	Clove	Pepper	Pineapple	Banana	Sago
Suitable	55	15	15	410	450	530
Unsuitable	4,931	4,971	4,971	4,576	4,536	5,516

Source: Team's estimates

Table 61. Major Production

(unit: Ton)

Kecamatan	Rice	Sweet Potato	Banana	Citrus	Fresh Fish	Sea Fish
North Siberut	1,009	268	210	168	26	1,055
South Siberut	1,404	193	540	231	21	845
Sipora	216	208	622	282	33	783
North-South Pagai	303	726	866	60	22	1,100
Total	2,932	1,395	2,238	2,336	102	3,783

Source: Padang Pariaman Dalam Angka (1987)

telecommunication services. Due to geological constraints, it is almost impossible to extend motorble road in the jungles. Rather, promotion of water transportation, on community level, taking advantage of sea and inland water ways, is more practical.

407. As long as a long future is concerned, the islands have tremendous potentials for further development if points of bottle neck in the development are eliminated and/or alleviated in reasonable manner. Ecology and nature protections are another aspect which constrains the socio-economic development here. Establishment of regional development plan which respects tradition and ecology of islands is strongly recommended.

4. Development Goals and Strategies

408. In the above context, development concept for the islands have two connotations as explained below: One is the connotation which is attributed to "Induced Development" on the issue "How to give an incentive for the take-off from pre-modern socio-economic system?", as the islands are not perfectly inter-dependent with the economy of other regions, especially with those in Sumatra. The other is the connotation of "Development or Nature Preservation?". The islanders have long been fostering self-reliant life style within the balance with nature. So, it seems to be not reasonable to change such life style into modernized one overnight. "How to find optimum balance between man and nature?" seems to be worthwhile issues to be debated. For the induction of more economic activities of the region, improved operation of transportation and tele-communication are most effective. Vitalized inter-connection or socio-economic interdependence and exchange of information, at least with mainland would pave the way for socio-economic development of the islands. But the above mentioned development should be conducted keeping balance with nature and tradition. So the ecological study vis-a-vis modernization program is worth to be conducted. In any case, "Make No Big Plan Concept" is still applicable to the region, as far as near future is concerned. Steady projects/programs, which aim at enhancement of current level of per-capita income and welfare standard by a few percent, are proposed to be formulated. Development scheme and spatial development plan are illustrated in Figure 44 and 45.

5. Identified Projects and Phasing

409. Identified projects and possible phasing about them are listed in Table 62.

Table 62. Mentawai Islands IDEP Project List

P-8	Mentawai Islands														
Code	Project	REPELITA V					REPELITA VI					REPELITA VII & VIII	High	GFS	Pub Inv Rep. V
		89	90	91	92	93	94	95	96	97	98	1999 - 2008	Priority		(US$M)
	I. Productive Sectors														
A-47	Cash Crop Development			-	--	++	++	++	++	++	++		0		0.7
A-49	Small-Scale Fishery Development			-	++	++	++	++					0		7.0
A-52	Pilot-Scale Fish Processing				-	++	++								
D- 4	Dev. of Marketable Handicraft Products				--	++	++	++					0	0*	0.4
D-54	Wood/Rattan Processing Industries					--	++	++							
D-55	Fishery/Aquaculture-Related Industries					--	++	++							
D-58	Craft Industries				--	++	++								
	II. Infrastructural Sectors														
E- 2	Rural Electrification			--	--	++	++	++	++	++	++	++++++++++	0	0*	1.0
F-47	Remote Island See Transportation Service			-	--	++	++	++	++				0	0*	0.5
F-48	Inland Waterway Development						--	--	++	++	++	++			
F-51	Mentawai Airport Const. and Maintenance						--	++	++	++	++	++++			
G-31	TDMA Satellite Link Expansion						++	++	++	++					
G-34	Coin Telephone Sets Provision								++	++	++	++			
G-38	Introduction of Rural Telecommunications			--	--	++	++	++	++	++	++	++	0	0	0.5
	III. Others														
H- 1	Natural Conservation Planning				--	--	++	++	++	++	++	+++	0		0.5
L-10	ADP for Mentawai Islands						--	-+	++	++	++	++++			
														Total	10.6

Notes: 1. ---- denotes "study," ++++ "implementation."
2. On-going projects are excluded from the list.
3. "GFS" stands for Guideline for Study. An asterisk (*) indicates that this Guideline for Study is common to several IDEPs.
4. Public investment is for Repelita V. The figures are subject to further study.

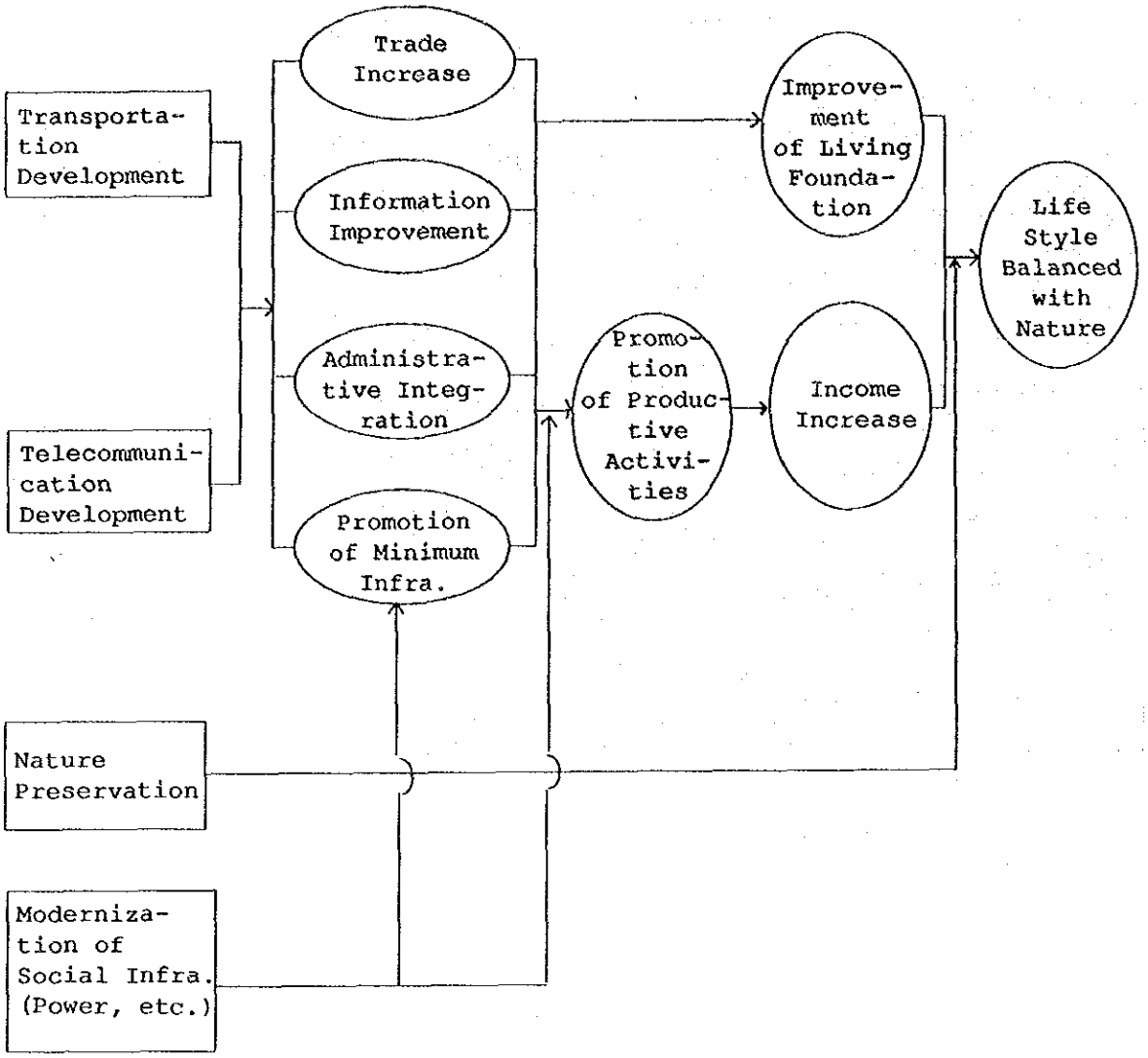


Figure 44. Mentawai Islands IDEP Development Scheme

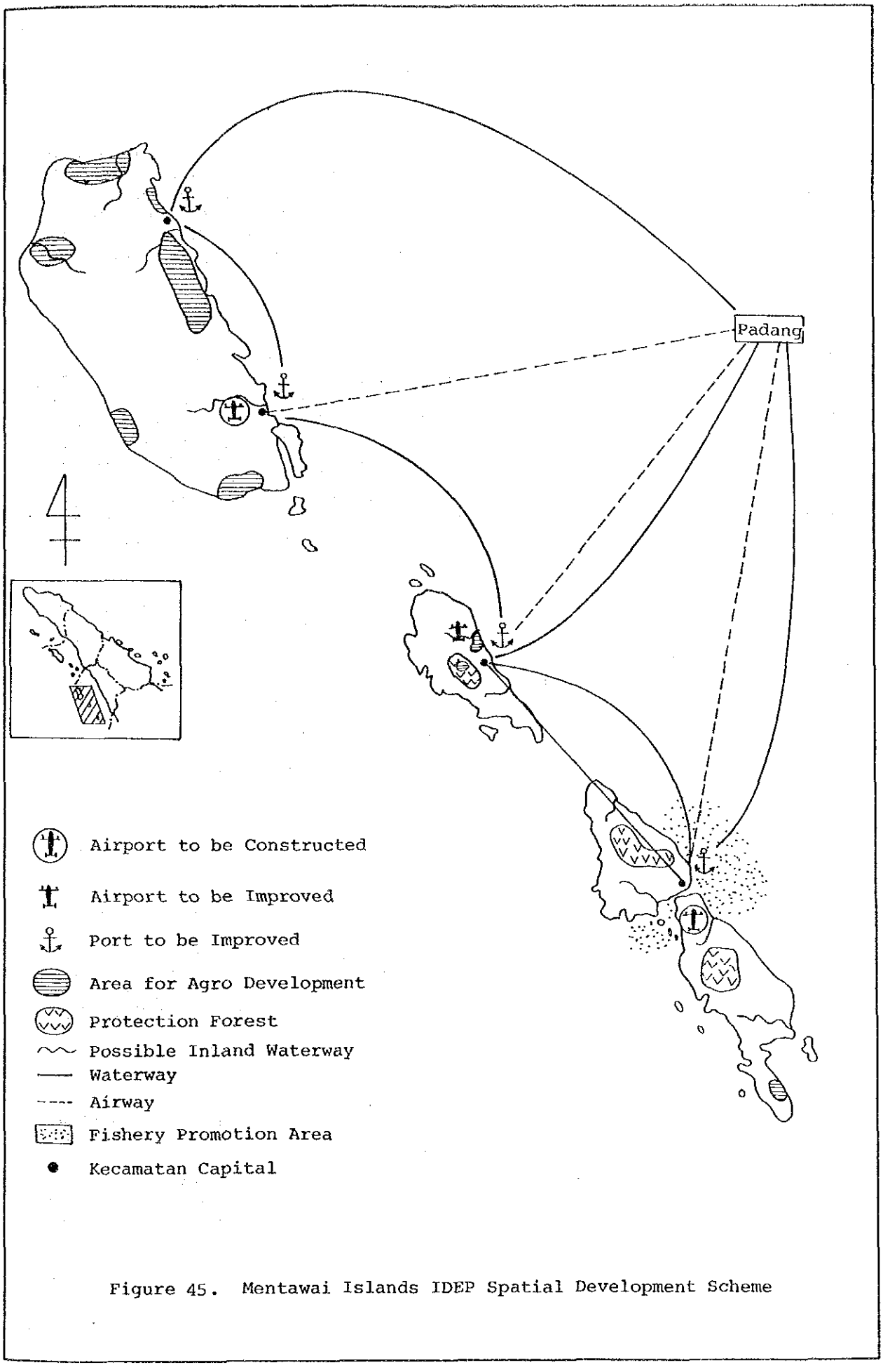


Figure 45. Mentawai Islands IDEP Spatial Development Scheme

I. Rokan Basin Integrated Development Program

1. Aims

410. The development in the area focuses on local and transmigration settlements and large-scale estates including NES/PIR Projects. In addition to private- and public-sector estates which will boost the growth of this long-isolated area, irrigation development utilizing water from three Rokan rivers (Rokan Kanan, Rokan Kiri and Batang Kumu) will be necessary to improve food security for the population living in transmigration settlements and estates.

2. Area Description

411. The area lies close to the border with North Sumatra Province, and the interprovincial road passes through it from Bangkinang in the southeast to Padangsidempuan of Tapanuli Selatan in the northwest. The area has long been sparsely populated, but the newly opened transmigration settlements are now located on the north side from the road, while large estates including NES/PIR projects have been developed on both sides of the road in the southeast toward Bangkinang. The area is also likely to benefit from the scheduled completion during Repelita V of the IBRD-financed bypass, which will connect the large estates directly to Dumai rather than via Bangkinang and Pekanbaru.

412. It can be said that the development of the upper Rokan basin area has begun, but only just. Pasirpengarayan, for instance, has an population of only 5,200 as of 1988, indicating that its functions as a primary local service center are yet inadequate vis-a-vis the outlying transmigration settlements.

413. Endowed with relatively favorable soil and climatic conditions, the area is said to have sizable agricultural potentials with possibility of agro-industrial development, which can be harnessed by the provision of irrigation and various support services.

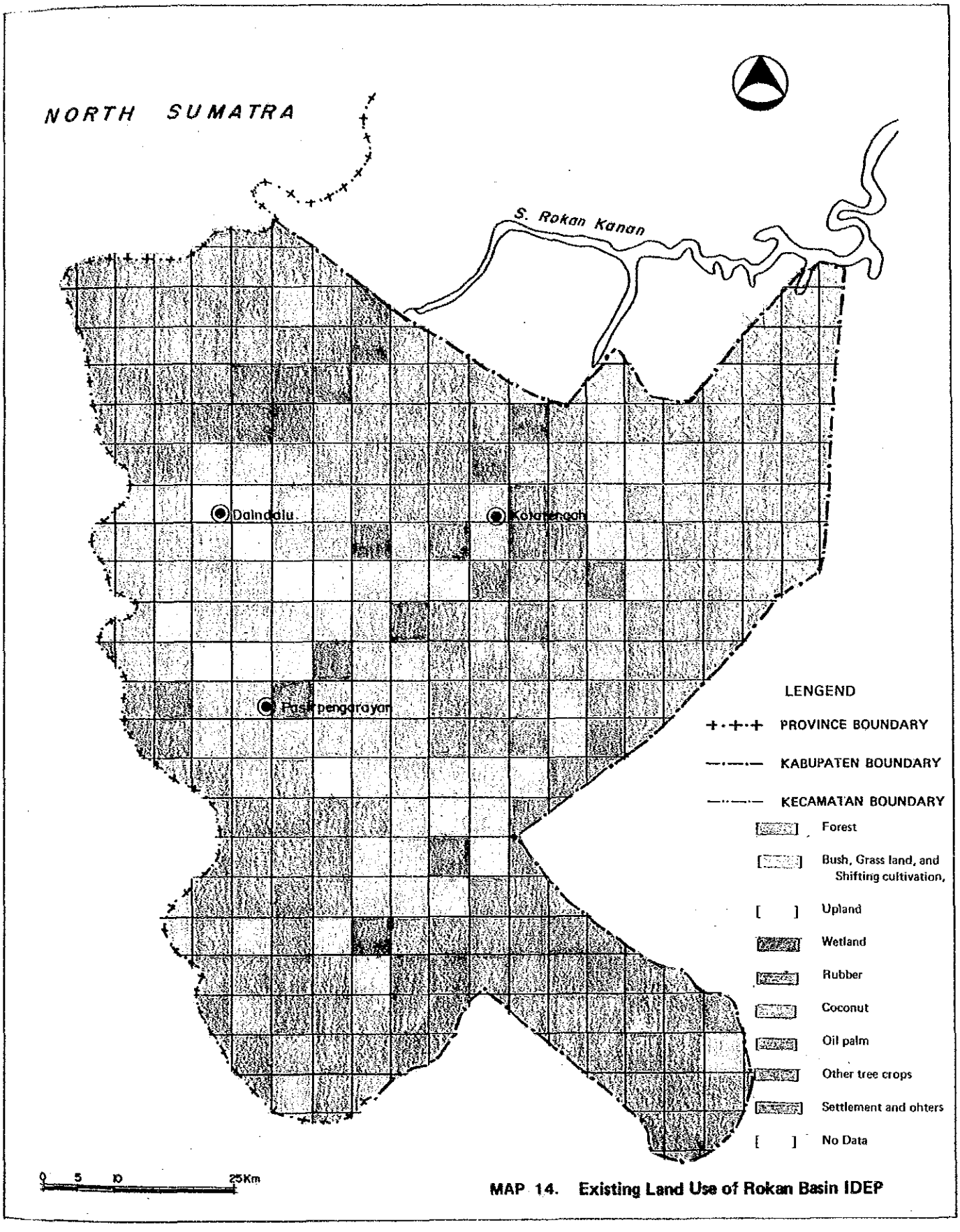
3. Phasing

414. Repelita V:

(i) A comprehensive water resource study of the upper Rokan basin will be needed to determine the total scale of possible development in the area, in addition to a few already identified or proposed projects such as Batang Kumu and Batang Sosa. While expediting the implementation of such projects, it is essential to disseminate viable tree/estate crop-based dryland farming systems among already settled farmers, including livestock and poultry raising to improve nutrition of the settlers.

(ii) With respect to infrastructural development, the road to Bangkinang, the upper-rank service center for Pasirpengarayan, need be upgraded. At the same time, it will be vital to improve feeder roads connecting outlying settlements to Pasirpengarayan The town itself will need public investments in water supply, electricity, and other basic infrastructure in order to stimulate small scale industry and service establishments which serve rural population as well as town residents.

415. Repelita VI:



MAP 14. Existing Land Use of Rokan Basin IDEP

(iii) Development of irrigation systems will continue on the basis of the findings of the water resource study, and support services will be expanded to improve the area's food security and to possibly provide surplus to estate communities nearby. At the same time, while possibilities of establishing large estates will be examined and pursued if considered feasible.

(iv) Basic infrastructure of Pasirpengarayan will be expanded or upgraded in accordance with its population growth. The upgrading of the road section connecting to Padangsidempuan will be started during this period, while rural feeder roads will be improved to link new agricultural settlements.

416. Repelita VII and After:

(v) Development of productive sectors will continue and pick up along the direction taken in the previous plans. Depending on the growth of Pasirpengarayan, the provision of an airstrip might be justified during this period.

Table 63. Rokan Basin IDEP Project List

P-9	Rokan Basin														
Code	Project	REPELITA V					REPELITA VI					REPELITA VII & VIII	High	GFS	Pub Inv Rep. V
		89	90	91	92	93	94	95	96	97	98	1999 - 2008	Priority		(US$M)
	I. Productive Sectors														
A-53	Dryland Farming Development		-+	++	++	++	++						0		1.8
A-54	Paddy Post-Harvest Technology Development					--	-+	++	++						
A-55	Livestock Development		-	++	++	++	++	+							
A-57	Smallholder Rubber Development						++	++	++	++	++				
A-58	Nucleus Estate and Smallholder Development								++	++	++	++++++++++++			
D-65	Agro-Industries			-	++	++	++	++					0	0*	
D-70	Livestock-Related Industries			-	++	++	++	++							
D-78	Light Engineering Industries			-	++	++	++	++							
	II. Infrastructural Sectors														
B-64	Rokan Basin Overall Development	-	--	-			++	++	++	++	++	++++++++++++	0		2.0
B-65	Batang Kumu Irrigation		++	++	++	++	++						0		35.0
B-68	Batang Lubuk Irrigation						--	--	--	++	++	++++++			
B-69	Batang Rokan Kiri Irrigation								--	--	--	+++++++++			
B-70	Batang Sosa Irrigation				--	--	++	++	++	++					
E- 1	Fuel Efficient Stove Dissemination	--	--	++	++	++	++	++	++	++	++	++++++++++++	0	0*	1.0
E- 2	Rural Electrification	++	++	++	++	++	++	++	++	++	++	++++++++++++	0	0*	2.0
E-32	Rokan Kiri-1 Hydropower						--	--		++	++	++++++++++++			
F-52	Dumai-P.Sidempuan Road Network Dev.						++	++	++						
F-61	River Transportation Development							--		++	++				
G- 4	Introduction of Rural Telecommunications			--	--	++	++	++	++	++			0	0*	10.0
G-43	TDMA Satellite Link Expansion						++	++	++	++	++				
G-44	100 Small Earth Stations Provision											+++++++++			
G-46	Coin Telephone Sets Provision				++	++	++	++	++						
K- 3	Secondary Cities Urban Development	-	--	++	++	++	++	++					0		5.0
	III. Others														
H- 3	Conservation & Management of Wildlife				--	++	++						0	0*	0.5
L- 2	Rural Technology Extension Program	-	--	++	++	++	++	++	++	++	++	++++++++++++			
L-12	ADP for North Kemper (and West Bengkalis)						--	--	++	++	++	++++++++++++			
P-12	Production and Marketing Study		--										0	0*	1.0
														Total	58.3

Notes: 1. ---- denotes "study," ++++ "implementation."
2. On-going projects are excluded from the list.
3. "GFS" stands for Guideline for Study. An asterisk (*) indicates that this Guideline for Study is common to several IDEPs.
4. Public investment is for Repelita V. The figures are subject to further study.

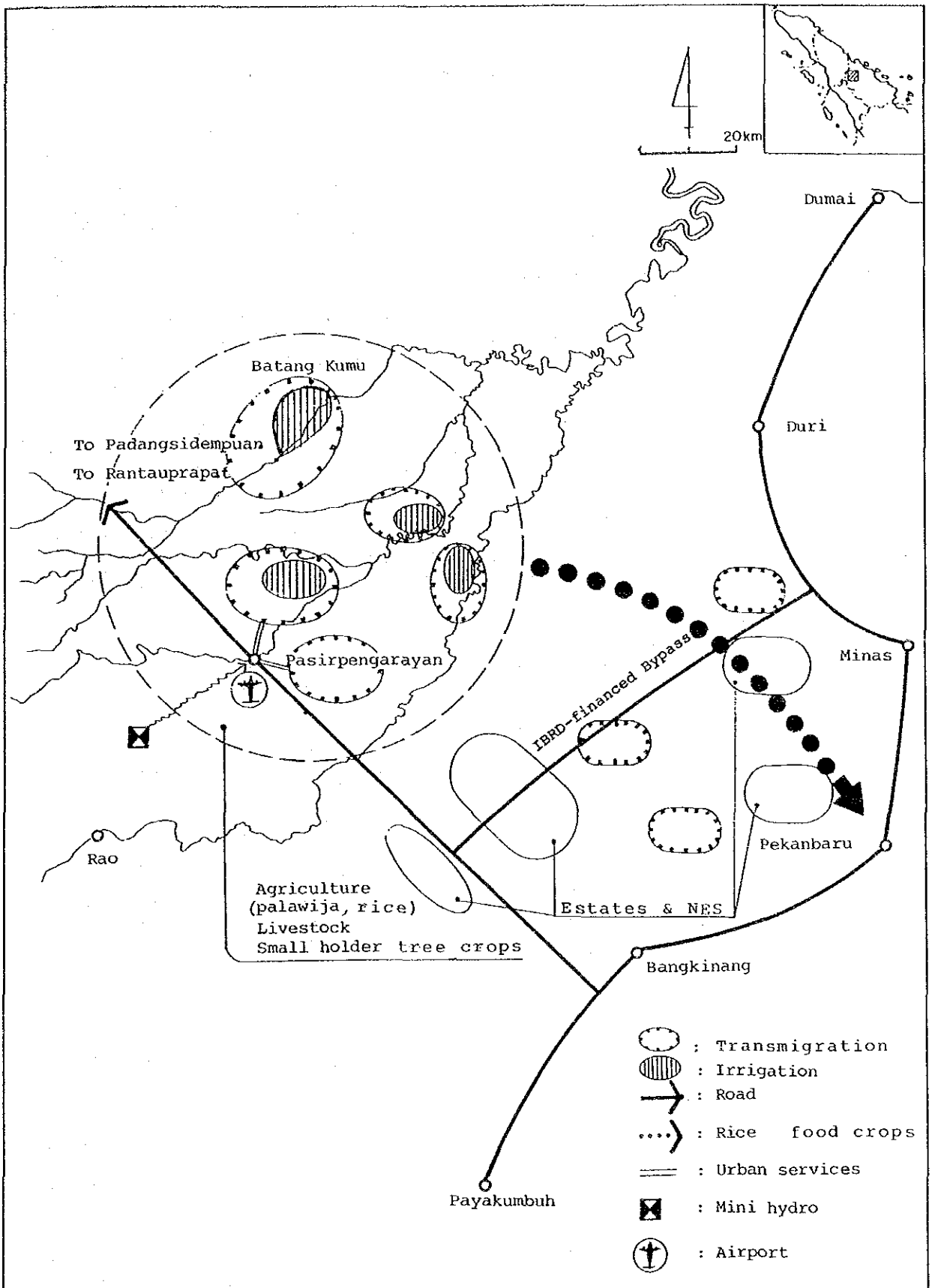


Figure 46. Rokan Basin IDEP Development Scheme