Ministry of Public Works
Republic of Indonesia

The Study on the Integrated Regional Development Plan for the Northern Part of Sumatra

Final Report

Vol. I
Executive Summary

March 1990

Japan International Cooperation Agency

Ministry of Public Works
Republic of Indonesia

The Study on the Integrated Regional Development Plan for the Northern Part of Sumatra

Final Report

Vol. I
Executive Summary

March 1990

Japan International Cooperation Agency

PREFACE

In response to a request from the Government of Republic of Indonesia the Japanese Government decided to conduct a study on the Integrated Regional Development Plan for the Northern Part of Sumatra and entrusted the study to Japan International Cooperation Agency (JICA).

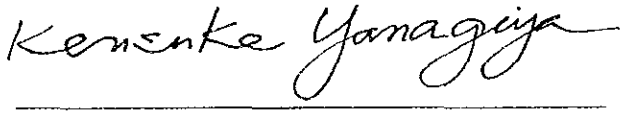
JICA sent to Indonesia a survey team headed by Mr. Kunio Takase, International Development Center of Japan, composed of members from the International Development Center of Japan and the Nippon Koei Co., Ltd. from April, 1988 to February, 1989, and from June to October, 1989.

The team held discussions with concerned officials of the Government of Indonesia, and conducted field surveys. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Republic of Indonesia for their close cooperation extended to the team.

March, 1990



Kensuke Yanagiya
President
Japan International Cooperation Agency

Ministry of Public Works — Japan International Cooperation Agency

INTEGRATED REGIONAL DEVELOPMENT PLAN FOR THE NORTHERN PART OF SUMATRA

Project Office: c/o Direktorat Tata Kota dan Tata Daerah, Direktorat Jenderal Cipta Karya, Departemen Pekerjaan Umum
Jl. Raden Patah 1, Kebayoran Baru, Jakarta Selatan Phone: 710387, 711750

PREFACE

The Study on the Integrated Regional Development Plan for the Northern Part of Sumatra was commenced in March 1988 and has just completed in March 1990 in accordance with the Scope of Work signed in January 1988 between the Ministry of Public Works, Government of Indonesia, and the Japan International Cooperation Agency (JICA).

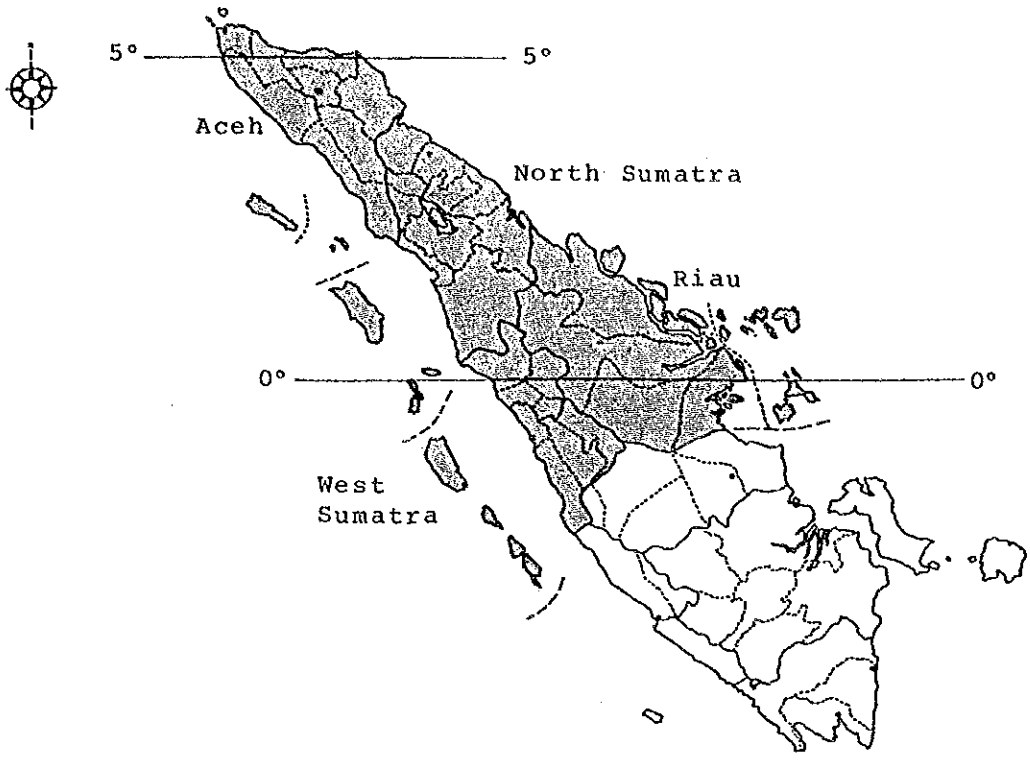
The Study covers four provinces, namely, Aceh, North Sumatra, West Sumatra and Riau. Main objectives of the Study are: (i) to formulate an Integrated Regional Development Plan of the Region as a part of National Development Plan; (ii) to identify projects to be considered for implementation during Repelita V and up to 2008; and (iii) to strengthen the planning and coordinating capability of the Provincial Planning Boards.

A joint team of the International Development Center of Japan (IDCJ) and the Nippon Koei Co., Ltd. was entrusted by JICA. The JICA Team consisting of 18 experts of various sectors submitted the draft final report to the Government on 15 December 1989, based on which the Fifth and Final Workshop was held at BAPPENAS, Jakarta, on 29 January 1990. The participants agreed that: (i) the Report would be very useful as a guideline for provincial planning and implementing the priority projects, especially "Integrated Development Programs (IDEPs)"; (ii) the Report would not imply any official commitment or the projects suggested in the Report were not intended to be exhaustive or definitive; and (iii) the Government should take immediate actions to translate it into government programs, sell them to various donors and private investors both domestic and international and implement them through the normal procedures of the government led by BAPPENAS. Comments received at the Fifth Workshop were duly incorporated into the five volumes of this Final Report.

In conclusion, I, on behalf of the JICA Team, would like to express my gratitude for the wholehearted support given by the two Governments, JICA, major donor agencies, and all the people concerned. I am confident that our cooperation has not only contributed to the regional development, but also created ever-lasting friendship between the two countries.

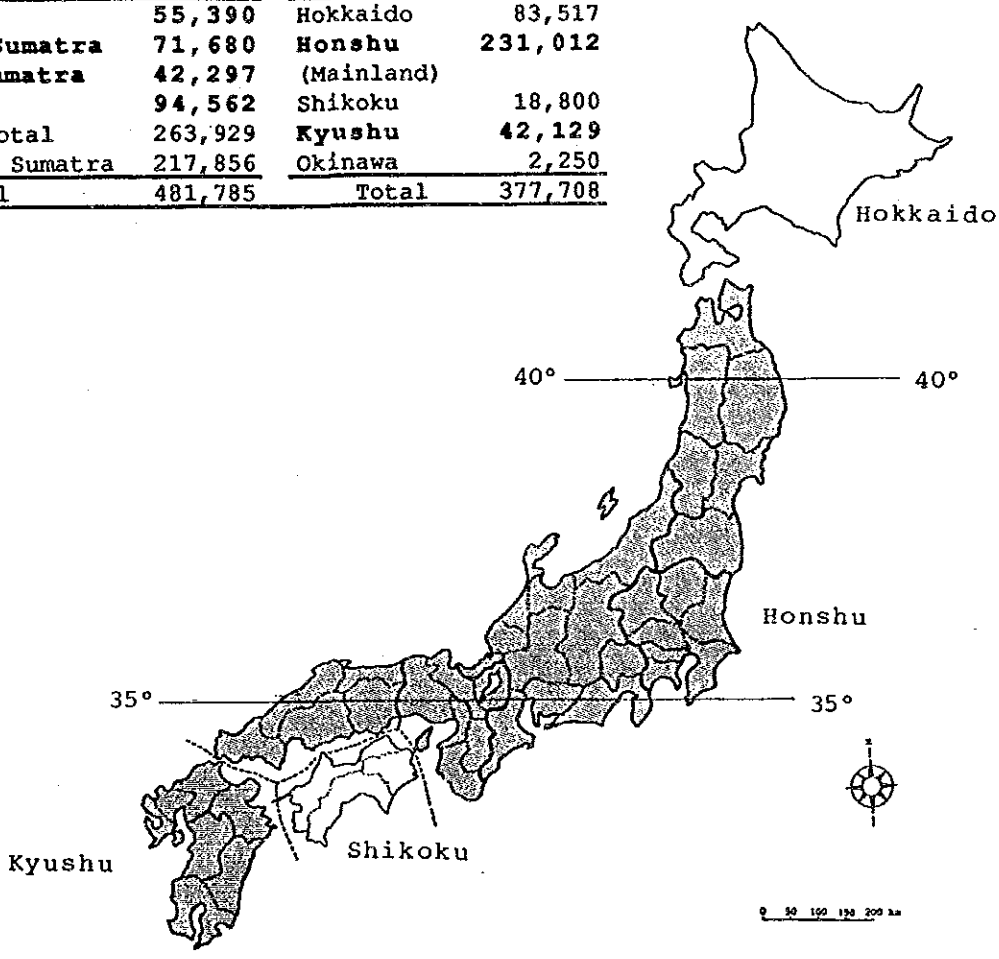
30 March 1990

Kunio Takase
Team Leader



Comparison of Land Area: Sumatra and Japan

Sumatra	(km2)	Japan	(km2)
Aceh	**55,390**	Hokkaido	83,517
North Sumatra	**71,680**	**Honshu**	**231,012**
West Sumatra	**42,297**	(Mainland)	
Riau	**94,562**	Shikoku	18,800
Subtotal	263,929	**Kyushu**	**42,129**
Southern Sumatra	217,856	Okinawa	2,250
Total	481,785	Total	377,708



VOL. I EXECUTIVE SUMMARY

VOL. II MAIN REPORT

VOL. III SECTORAL ANALYSES

VOL. IV PRIORITY PROJECTS AND PROJECT INFORMATION

VOL. V LAND USE MAPS (16 pieces)

FINAL REPORT
VOL. I
EXECUTIVE SUMMARY

TABLE OF CONTENTS

III. SECTORAL DEVELOPMENT STRATEGY

IV. SELECTION OF PRIORITY PROJECTS

V. FINANCE AND INSTITUTION

VI. CONCLUSIONS AND RECOMMENDATIONS

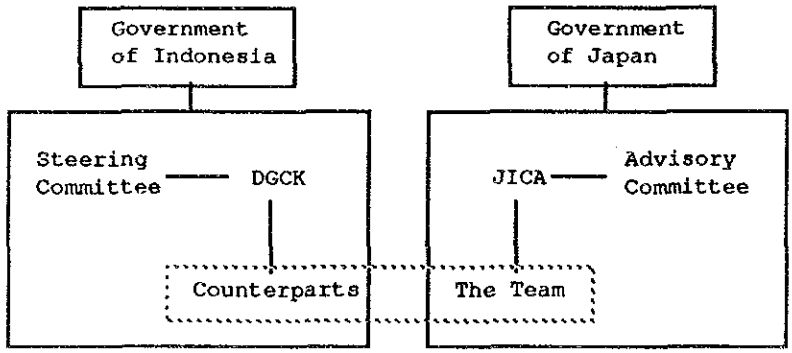
I. INTRODUCTION

1. Work Program

As shown in Diagram 1, the entire period is divided into five stages, each of which has a specific target of administrative significance like "IGGI proposal" and "budget for 1990/91". This program is a modified one, advancing the "selection of priority projects" by seven months and expanding the "preparatory study period of priority projects" from the original five months to seven months. These modifications were strongly requested by the Indonesian Government to facilitate the process and implementation of Repelita V (1989/90 - 1993/94).

2. Study Organization

The overall organizational framework to implement this Study is shown below. The Steering Committee consists of the Ministry of Public Works, BAPPENAS, the Ministry of Home Affairs and four BAPPEDA concerned. The Advisory Committee is set up by JICA to provide the Team with appropriate advice on study implementation. The Team worked closely with the government counterparts on day-to-day basis, and spent about half of its operation time each in the four provinces and in Jakarta. In addition, six counterpart members including three senior government officials made study trips to Japan for two-three weeks during the study period.



3. Performance of the Study

Throughout the two-year period of the Study, continuous policy dialogue was maintained between the two governments through a series of workshops/briefing sessions, which has contributed to formulating broad consensus on the development philosophy and reaching "4 I-principles" to guide the Study. The idea is that the outcome of the study should be:

(i) implementable plan timely prepared; (ii) internationally acceptable standard; (iii) integrated program and execution; and (iv) institutionally responsible organization

Diagram 1. Indicative Work Program of the Study

Year/ Month	Stage	Operation in Indonesia	Workshop/ Briefing	Report	Target
88/4	I. Initial Operation	A B C D		Inception	Inception
5					
6	II. Development of Strategies		▲	Progress I	
7					
8			△		
9			△		
10	III. Selection of Projects/ Programs		▲	Progress II	Repelita V
11					
12			△ △		
89/1					
2			△ △ ▲	Interim	IGGI Proposal
3					
4	IV. Preparatory Studies of Priority Projects/ Programs				
5					
6					
7			△		
8					
9					
10			△ △ ▲	Progress III	Budget for 1990
11	V. Finalization of Report				
12				Draft Final	
90/1			▲		
2					
3				Final	IGGI Proposal

Notes: 1) Bars show approximate itinerary for:
(A) Takase, Toyomane, Sato, (Homma), Miki, Matsuda, Hatao
(B) (Fujimura), Fukao, Ishida, Ichihara, Yoshimeki, Fujii
(C) Osada, Nagamatsu, Iwai
(D) Kawabata, Ueda, (Oyama), (Fujiwara), Shiroya, Watanabe
2) ▲ Workshop, △ Mini-workshop, △ Briefing

4. The Region

The Region lies in the westmost past of Indonesia, extending about 1,200 km from Banda Aceh (6°N) crossing over the equator to the southern border of West Sumatra Province (3°S). As shown in Diagram 2 the land area is 264,000 km^2 (which is as large as Japan's two mainlands, Honshu plus Kyushu) and the population was 20 million in 1988 (which is larger than Malaysia's). Its popultion density of 76 heads km^2 was slightly below the national average (91), but far below that of Java (800).

5. Region's Economy

The GDP figures reveal a remarkable discrepancy between regional GDP including oil and gas (oil/gas GDP) and regional GDP excluding oil and gas (non-oil/gas GDP). In terms of per capita GDP, the Region's figures are compared with national figures. The high values of oil/gas GDP per capita for Aceh and Riau are misleading, however, since those are largely owing to the oil and natural gas production in the respective provinces which does not contribute much to their welfare. When non-oil/gas GDP per capita is compared, the four provinces are at almost the same level, slightly higher than the national average. This regional average, however, conceals a wide discrepancy in the income level within the Region. Western side is generally lagging behind the eastern side in its development. This is especially the case when several islands along the western coast are concerned. There are also some backward areas on and off the eastern coast, particularly in Riau.

6. Comparative Advantages of the Region

The Region's position in the economic development of Indonesia is one of the intermediate between the most advanced Java and the rest of the outer islands. With respect to development potential, however, the Region ranks among the highest, having all the following characteristics.

(i) Abundant natural resources (land, water resources, marine resources, forest, mineral deposits, etc.);

(ii) Exportable commodities (oil, gas, palm oil, rubber, coffee, sawn timber, shrimp, etc.);

(iii) The largest industrial base outside Java;

(iv) Relatively well-developed infrastructure;

(v) A variety of tourist attractions such as Lake Toba; and

(vi) Proximity to Singapore and Malaysia as well as easy access to the international navigation route.

Diagram 2. Key Indexes of the Region

Index	Aceh	North Sumatra	West Sumatra	Riau	Northern Sumatra	INDONESIA
1. Land area (km^2)	55,390	71,680	42,297	94,562	263,929 (13.8)	1,919,443 (100.0)
2. Population (x1,000, 1988)	3,225	10,104	3,839	2,821	19,989 (11.4)	174,825 (100.0)
3. Population growth rate (%, 1988-93)	2.54	2.23	1.05	3.11	2.19	1.91
4. GDP (with oil/gas) (Rp.billion, 1986 current prices)	5,979	5,041	1,833	5,583	18,436 (19.1)	96,489 (100.0)
5. GDP per capita (Rp. million)	1.95	0.54	0.49	2.12	0.97	0.57
6. GDP (without oil/gas) (Rp.billion, 1986 current prices)	1,873	4,839	1,833	1,427	9,972 (12.1)	82,302 (100.0)
7. GDP per capita (Rp. million)	0.61	0.51	0.49	0.54	0.53	0.49
8. Rice production (unhusked, 1,000 Mt, 1986)	1,039	2,068	1,422	366	4,895 (12.3)	39,727 (100.0)
9. Rice demand (unhusked, 1,000 Mt, 1986)	721	2,246	892	618	4,478	-
10. Total wet farm land (1,000 ha, 1986)	324	518	224	179	1,245 (16.4)	7,600 (100.0)
11. Estate (1,000 ha, 1986)	339	1,133	247	691	2,410 (27.1)	8,891 (100.0)
12. Manufacturing employees (large and medium, x1,000, 1985)	11	89	11	24	135 (8.2)	1,635 (100.0)
13. Commodity export (port base, US$ million, 1987)						
-Crude oil and oil products	658	37	0	3,681	4,376 (71.1)	6,157 (100.0)
-Natural gas and other gasses	1,363	0	0	0	1,363 (56.8)	2,399 (100.0)
-Non-oil/gas	90	1,275	180	280	1,825 (21.3)	8,580 (100.0)
Total	2,111	1,312	180	3,961	7,564 (44.1)	17,136 (100.0)

Sources:
1. Dalam Angka of each province
2, 3. Team's estimates
4, 5, 6, 7. Regional Income 1983-1986 of each province; BPS, National Income of Indonesia 1983-1986
8. BPS, Statistical Year Book of Indonesia 1987
9. Team's estimates
10, 11.. BPS, Land Area by Utilization in Java (1986) and Land Area by Utilization Outer Java (1986)
12. Dalam Angka of each province; BPS, Economic Census 1986
13. Compiled from BPS, Indonesia Foreign Trade Statistics: Exports 1987

II. INTEGRATED DEVELOPMENT CONCEPT

7. Review of National Development Programs (Repelita I-IV)

(i) Since Repelita I (1969/70 - 73/74) which started in April 1969, Indonesia has adopted three goals, namely, equity, growth and stability (the Trilogy) as the guideline for its development. While the first priority during Repelita I was "stability" with special emphasis on rehabilitation of devastated infrastructures during the political crisis period, and during Repelita II (1974/75 - 78/79) it was "growth" with initiating construction of major infrastructure, the priority order during Repelita III (1979/80 - 83/84) and IV (1984/85 - 88/89) was: (i) equity, (ii) growth, and (iii) stability. During these 20-year periods, national development policy achieved considerable success, attaining self-sufficiency in rice and the average annual GDP growth rate of 4.8% in real terms during 1965-1985. This was the second highest among the ASEAN countries, only next to Singapore.

(ii) However, the steady softening of the international oil market and the real prices of Indonesia's main primary exports, starting from the early 1980s, and together with the sharp appreciation of the Japanese yen since 1986, the Indonesia economy faced difficult time. In order to reduce its balance of payment deficit, the Government introduced a series of economic stabilization program and structural adjustments since 1983. They included budgetary cuts, tax reforms, devaluations of Rupiah, promotion of non-oil/gas exports, privatization, decentralization and deregulation in production, investment, transportation and financial and banking sectors. The IGGI supported these Government's policies and provided a large amount of special assistance or policy-based lending in the forms of untied fast-disbursing program and local currency lending for immediate balance of payment support and local-cost financing for the budget.

8. Goals of Repelita V and Beyond

Repelita V (1989/90-1993/94) represents the last 5-year period of the first 25-year Long-Term Development starting in 1969. The primary task of this closing phase is to accomplish the structural adjustment of the Indonesian economy, which is a prerequisite to enter its "take-off" process during Repelita VI, the first phase of the second 25-year Long-Telrm Development serving as the strong springboard. The priority order of the trilogy remained intact in Repelita V, as (i) equity, (ii) growth, and (iii) stability.

9. Major Targets of Repelita V

Against these targets, the Plan expected 1.9% of the average annual population growth rate and estimated the labor population would increase by 11.9 million during the period of Repelita V, from 74.5 million in 1989/90 to 86.4 million in 1993/94. In order to give them productive and remunerative employment, the Plan determined that the average annual rate of economic growth should be 5%. The Plan placed the priority on harmonious development of agriculture (self-sufficiency in food-stuff and increasing other agricultural outputs for domestic demand and export) and industry (producing export-oriented goods and absorbing large manpower). By increasing non-oil/gas export, debt-service-ratio will be reduced from around 35% currently to under 25% by the final year of Repelita V. In order to reach an average annual growth rate of 5%, an investment of around Rp.240 trillion (26.4% of the GDP) will be required for the next 5-year period. Out of this total, about Rp.107 trillion or 45% is state development budget, while about Rp.133 trillion or 55% is state routine budget. On the revenue side, it should be noted that foreign aid accounts to Rp.60 trillion (about 56% of the state development budget). Major targets of the Repelita V is shown in Diagram 3.

Diagram 3. Major Targets of Repelita V (1989/90 - 93/94)

(i) State Budget

Rp. billion

	Revenue				Expenditure		
Year	Oil/gas	Non oil/gas	Foreign Aid	Total	Routine	Develop-ment	Total
1989/90	7,899.7	17,350.1	11,325.1	36,174.9	23,445.0	13,129.9	36,174.9
90/91	9,148.7	20,283.8	11,566.0	40,998.5	24,829.6	16,168.9	40,998.5
91/92	9,705.9	25,150.6	12,644.8	47,501.3	26,591.6	20,909.7	47,501.3
92/93	10,950.2	30,516.2	12,195.0	53,661.4	27,974.4	25,687.0	53,661.4
93/94	11,779.2	37,130.2	12,687.0	61,596.4	29,959.8	31,636.6	61,596.4
Total	49,483.7	130,430.9	60,417.9	240,332.5	132,800.4	107,532.1	240,332.5

Source: Repelita V, Government of Indonesia, 7 January, 1989

(ii) Sectoral Planning

Sector	Annual Growth Rate of GDP(%)	Annual Growth Rate of Employment(%)	State Development Budget (Rp.Billion)	Contribution to GDP(%) 1988	1993
Agriculture	3.6	2.0	17,343(16.1%)	23.2	21.6
Mining	0.4	1)	11,194(10.4%)	15.9	12.6
Industry	8.5	6.7	2,119(2.0%)	14.4	16.9
Construction	6.0	4.4	2)	5.6	5.8
Commerce	6.0	4.5	1,429(1.3%)	15.9	16.7
Transportation and Communication	6.4	4.0	20,512(19.1%)	5.7	6.0
Others	6.1	1)	54,935[3] (51.0%)	19.3	20.4
Total	5.0	3.0	107,532(100%)	100.0	100.0

Notes: 1) Not available.
2) No figures specified but distributed into other items.
3) Including 10,711(10.0%) for regional development and 16,981(15.8%) for education/youth/culture.

Source: Repelita V, Government of Indonesia, 7 January 1989.

10. First Year of Repelita V

The state budget for 1989/90 (first year of Repelita V) amounts to Rp.36.5 trillion (about US$21.4 billion), calling on the nation to launch an all-out struggle to raise tax revenues. This amount is 26% increase over the previous year's budget, with a breakdown of declining by 11% of the oil/gas earning (Rp.8 trillion) and of increasing by 34% of the non-oil/gas revenue (Rp.17 trillion). These targets are undoubtedly ambitious, but the economic performance of the country so far is excellent, with the successful macro-economic structural changes and deregulation measures undertaken by the Government in the recent years, current favorable international prices of oil/gas, people's enthusiasm for development and the political stability of the resource-rich country. Reflecting these good performance, Mr. Sumarin, the Minister of Finance was awarded as "The Minister of Finance of the Year 1989" at the time of the IBRD/IMF Annual Meeting in Washington, D.C., in September 1989. The state development budget for 1989/90 is shown in Diagram 4.

11. Global Prospect of Indonesian Economy

It is worthwhile to look at the Indonesian economy from international point of view. As already well known, Asian economies, particularly those of NIEs and ASEAN countries, have outperformed other regions in the world. Those economies have achieved rapid export-led growth as the governments have shifted their development strategies from import-substitution to export promotion coupled with encouraged foreign direct investments. The bulk of exports from NIEs (over 90%) are manufacture goods, while primary commodities and mineral fuel still comprise large shares in ASEAN's exports. It is almost certain that the western rim of the Pacific Ocean consisting of East and Southeast Asian countries would be one of the three global economic powers with the West Eruopean and North American Economic Zones around the turn of the century, the period which this Study is aiming at. Then, Indonesia, the fifth largest country in its population and 14th largest in its land in the world with full varieties of natural resources would play an important role as the south-western end of the West Pacific Economic Zone.

12. Region's Development Goals

The Trilogy of course represents the Region's long-term goals as well. However, the current priority order among the Trilogy -- (i) equity, (ii) growth and (iii) stability -- does not need to apply uniformly to all regions or sectors in Indonesia. Rather, in order to make the most efficient use of the Region's comparative advantages, the Team considers it appropriate to set the priority order for the Region as (i) growth, (ii) equity and (iii) stability throughout the planning period. Needless to say, due attention should and will be paid to equity and stability within the Region even though economic efficiency is adopted as the main theme of its development. This was approved by the Steering Committee during the Second Workshop held in October 1988.

Diagram 4. State Development Budget for 1989/90

Sub-sector	Budget (Rp. billion)		
Agriculture	1,416		
Irrigation	578	--------	1,994 (Agriculture)
Industry	342	--------	342 (Industry)
Mining	181		
Energy	1,434	--------	1,615 (Energy/Mining)
Highway	1,380		
Land Transport	296		
Sea Tansport	285	--------	2,522 (Transportation/
Air Transport	378		Communication/
Postal/Telecommunication	145		Tourism)
Tourism	38		
Commerce/Trade	55		
Cooperatives	145		
Labor	74		
Transmigration	261	--------	2,113 (Regional
Regional Development	1,552		Development)
Religion	26		
Education/youth	1,510		
Vocational Education	161		
Culture	12	--------	2,737 (Human Resources
Health	250		Development)
Social/Women	25		
Family Planning	159		
Housing	620		
Laws	29		
Defence/Police	813		
Information Service	46		
Science/technology	161	--------	1,806 (Miscellaneous)
Research	118		
Administrations	99		
Private Enterprise	291		
Resources/Environment	249		
Total			13,129*

Source: Repelita V, Indonesian Government

* This amount plus Rp. 23,445 billion (Routine Budget) make total fiscal budget for 1989/90 amounting to Rp 36,574 billion, or equivalent to US$21.4 billion. (US$1 = Rp 1,700.)

13. Region's GDP

Based on: (i) available data (Bappenas and Bappeda projections) for the Repelita period; (ii) past performance; (iii) growth potential; and (iv) development strategy adopted by the Study, the Team prepared its own projections on the national non-oil/gas GDP growth. Then, the growth rates for the Region were set at a level 0.8 to 1.0 percentage point higher than the national rates, hereby conforming to the primary emphasis on economic efficiency in the Region's development. The Region's figures were then broken down into respective sectoral growth rates, as shown in Diagram 5.

14. Region's Population

National population projections for 1990-2005 are given by BPS (Biro Pusat Statistik). Provincial projections for 1990 are also given by BPS, but used with some modifications. Other figures are projected with the following set of assumptions: (i) The annual growth rate of Sumatra will keep about 0.9 percentage point higher than the national average; (ii) While the current high growth rate of Southern Sumatra will continue until around 2000, Northern Sumatra's, after a modest decrease, will eventually increase to surpass the former after 2005;. (iii) Aceh will see in-migrants increase due mainly to industrialization on the eastern coast; (iv) North Sumatra will experience a rapid population growth after 2000 with the development of the industrial base in and around Medan; (v) West Sumatra will see continued outmigration, but its rate will gradually decline; and (vi) Riau will keep a high population growth as spontaneous migrants and transmigrants continue moving in.

15. Incremental Capital Output Ratio (ICOR)

The amount of capital investment required to achieve the projected GDP growth is estimated by using the concept of ICOR, which is defined as:

$$\text{ICOR} = \frac{\text{Gross fixed capital formation}}{\text{GDP increase}}$$

The smaller ICOR is, the more efficient becomes investment. According to the World Bank data, ICOR for Indonesia was 2.8 in the 1960s, 2.3 in the '70s, but shot up to 7.4 in 1980-85 suggesting a marked decline in efficiency. As is seen, ICOR values are expected to rise during 1988 - 93. This is due to the lower efficiency of investment during the period resulting from a larger portion of investment going into infrastructure either to build up the minimum or to sustain the existing systems while continuing the economy's restructuring. Thailand figures were 2.5, 3.7 and 4.9, respectively.

Diagram 5. GDP, Population and ICOR

(in 1983 Constant Price)

	1988 (share %)		2008 (share %)	
National GDP (non oil/gas)	70,159	(100.0)	219,665	(100.0)
Agriculture	20,603	(29.4)	38,680	(17.6)
Mining	674	(1.0)	2,010	(0.9)
Manufacturing	8,355	(11.9)	40,761	(18.6)
Others	40,527	(57.8)	138,214	(62.9)
Region's GDP (non oil/gas)	8,425	(100.0)	31,357	(100.0)
Agriculture	2,974	(35.3)	7,826	(25.0)
Mining	124	(1.5)	337	(1.1)
Manufacturing	1,106	(13.1)	6,301	(20.1)
Others	4,221	(50.1)	16,892	(53.9)
Region's Population	19,989	(11.4)	30,475	(12.7)
Aceh	3,225	(1.8)	5,121	(2.1)
N. Sumatra	10,104	(5.8)	15,658	(6.5)
W. Sumatra	3,839	(2.2)	4,665	(2.0)
Riau	2,821	(1.6)	5,031	(2.1)
National Population	174,825	(100.0)	239,580	(100.0)

	Region	Nation
GDP Annual Growth Rate (%)		
1988 - 1993	5.7	4.8
1988 - 2008	6.8	5.9
Population Annual Growth Rate (%)		
1988 - 1993	2.2	1.9
1988 - 2008	2.1	1.6

	1984-1988	1988-1993	1993-1998	1998-2008
Region's ICOR	4.3	4.5	4.0	3.6
Aceh	4.1	4.4	4.0	3.7
N. Sumatra	3.9	4.2	3.8	3.4
W. Sumatra	2.8	3.2	3.0	2.8
Riau	7.4	7.5	6.4	5.2

Source: Team's estimation

16. Master Development Strategy

The Team's basic thinking was that the Region can and must grow first to make the economic pie bigger, quickly. Otherwise, the small pie cannot satisfy everyone even if it is divided equally. However, this does not mean that growth and equity are in trade-off relation. In fact, recent experiences in developing countries show that a strong positive relationship holds between economic growth and the performance of most social indicators. On the other hand, it is unavoidable for the equity gap to widen at some point of development process, where Indonesia seems to have just arrived. Growth with equity is thus adopted as the master strategy for the Region's development, where growth should receive basic strategic choice, with due attention to equity within the Region. To cope with the rapid increase of economically active population by 2.88% annually or about one million workers during Repelita V (1989/90 - 93/94), creating more job opportunities was explicitly mentioned as a part of master development strategy. Another important development issue is environment. The Team believes that there is no rigid trade-off relation between development and environment, but the two should go together; first, conserve to develop, and second, develop to conserve. This should also be included in the master development strategy.

17. Sector-Specific Development Strategy

This master strategy is fundamental enough to apply to numerous aspects. As shown in Diagram 6, production sectors and infrastructure sectors are intricately related each other. The following five corollaries or sub-strategies are aspect-specific interpretations of this master strategy:

(i) (Agriculture) Strengthening the agricultural sector to vitalize the local economies, give basis for agro-industries, and provide employment and income opportunities;

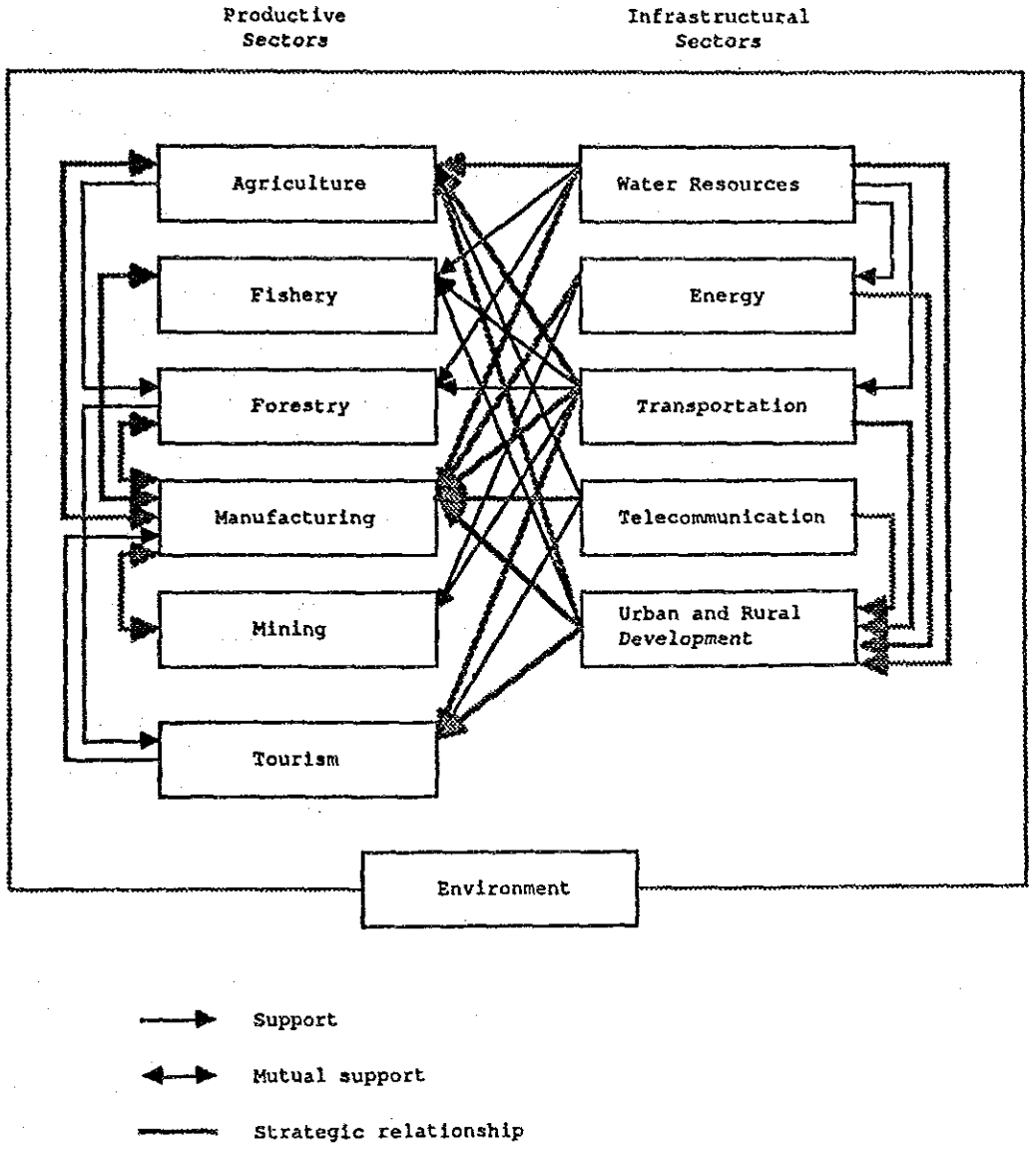
(ii) (Industry and mining) Establishing resource-oriented manufacturing bases to attain efficient economic growth and export expansion;

(iii) (Space) Promoting city-based development while efficinently spreading effects through urban-rural linkages and developing Medan as the regional center of social and economic activities;

(iv) (Infrastructure) Providing infrastructures as needed to support and induce economic and spatial development; and

(v) (Welfare) Aiming at the reduction of regional disparities and the realization of a balanced development.

Diagram 6. Intersectoral Development Strategy



18. Needs for Integrated Approach

The development of this vast area with a limited financial resources and human resources calls for the most effective planning of high priority projects in various sectors based on the right strategy. However, under the current administrative setup, sectoral projects are administered by respective sectoral agencies in the Central Government according to their own priority. In identifying priority projects to be implemented most effectively during the 20-year planning period, this Study has adopted an integrated approach which combines sectoral and area approach in both planning stage and implementation stage.

19. Goals, Objectives and Framework

The long-term development goals for the Region are first clarified taking into account the national goals set forth in a series of Repelita and other official documents. They are: (i) growth; (ii) equity; and (iii) stability. More specific objectives are then identified to attain those general goals. After studying the Region's present conditions and future potentials, the Team specifies five objectives: (i) food base; (ii) export/tourism; (iii) industry base; (iv) in-migration; and (v) economic linkage.

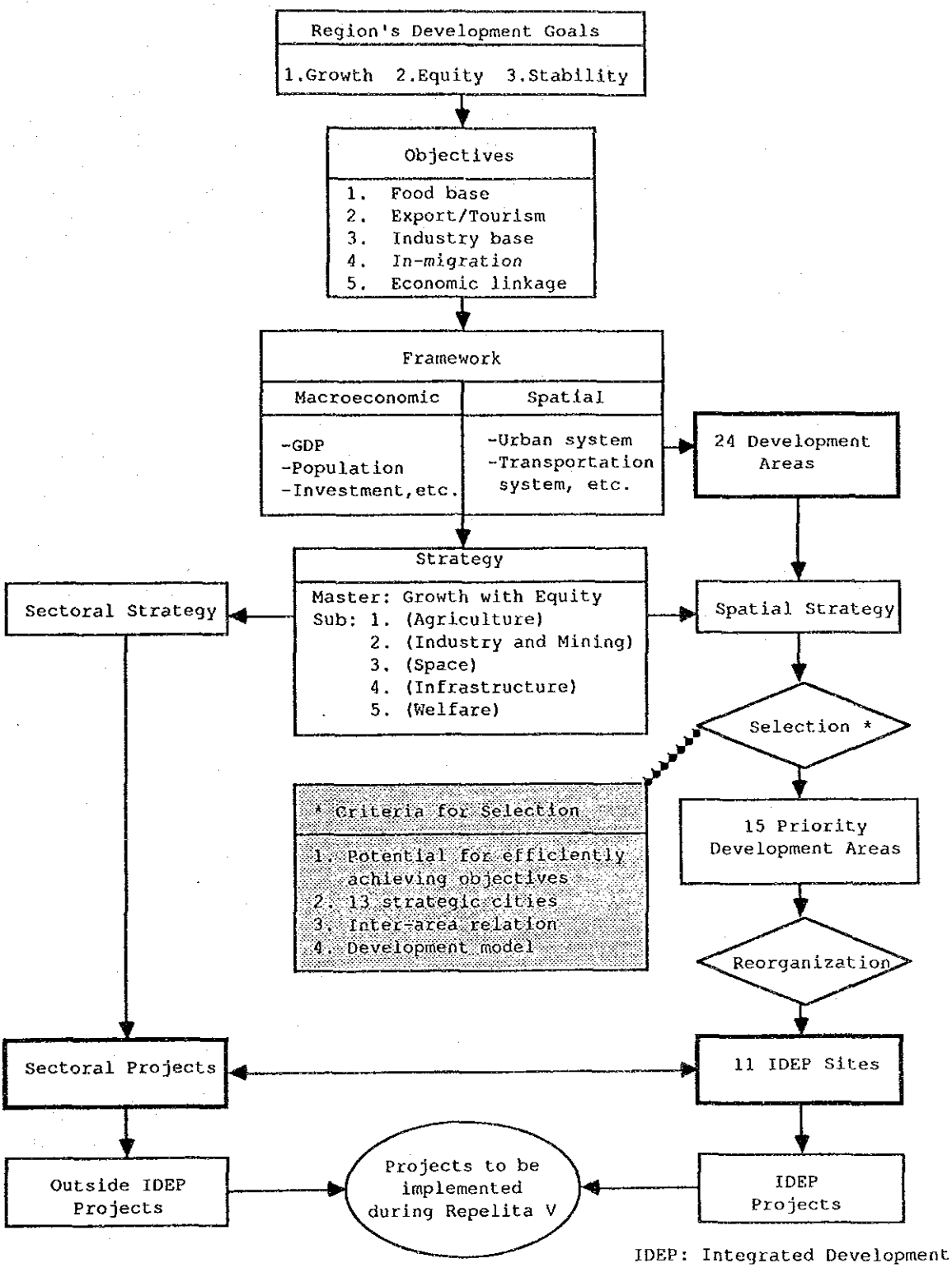
20. Priority Development Areas

The Team has first divided the Region into 24 sub-regional areas to assess development potentials and priority systematically. These areas are then classified into three categories: namely, (i) 6 advanced areas; (ii) 14 less advanced areas; and (iii) 4 remote islands. Based on the following criteria, 15 development areas were chosen: (i) high potential for efficiently achieving the development objectives; (ii) areas where 13 strategic cities were located; (iii) areas with strong or potentially strong inter-area relation; and (vi) areas which can serve as a development model, with some unique aspect.

21. Selection of Integrated Development Program (IDEP)

After reorganizing the 15 development areas selected above, and sharpening their characteristics, the Team finally narrowed down into 11 IDEPs. An IDEP actually consists of a set of projects which are necessary to perform the area's role effectively and efficiently. In their identification, however, sectoral projects formulated according to the sectoral strategy in a broad perspective were constantly referred to, and both IDEP and sectoral projects were modified, if necessary, to ensure their mutual consistency within the wider framework and the IDEP approach. The Team's overall planning procedure from the development goals to selection of IDEP is shown in Diagram 7.

Diagram 7. Overall Planning Procedure



IDEP: Integrated Development Program

22. Topography and Development Pattern

The Region consists of four distinct parts: the mountainous areas along the Barisan range, the vast alluvial plains on the eastern coast, the narrow coastal strip along the western coast, and the islands off the eastern and the western coast. The development of the eastern side (North Sumatra, in particular) started in a large scale during the Dutch colonial period establishing many plantations of rubber and oil palm. Plantation development has been active since then, extending further southward into Riau, where a vast stretch of land is still available. In contrast, the coastal strip on the western side has generally been in an inferior position, lacking enough arable land and easy transportation access. The conditions are worse for the islands off the mainland. As a consequence, these areas largely remain backward compared with the other parts of the Region.

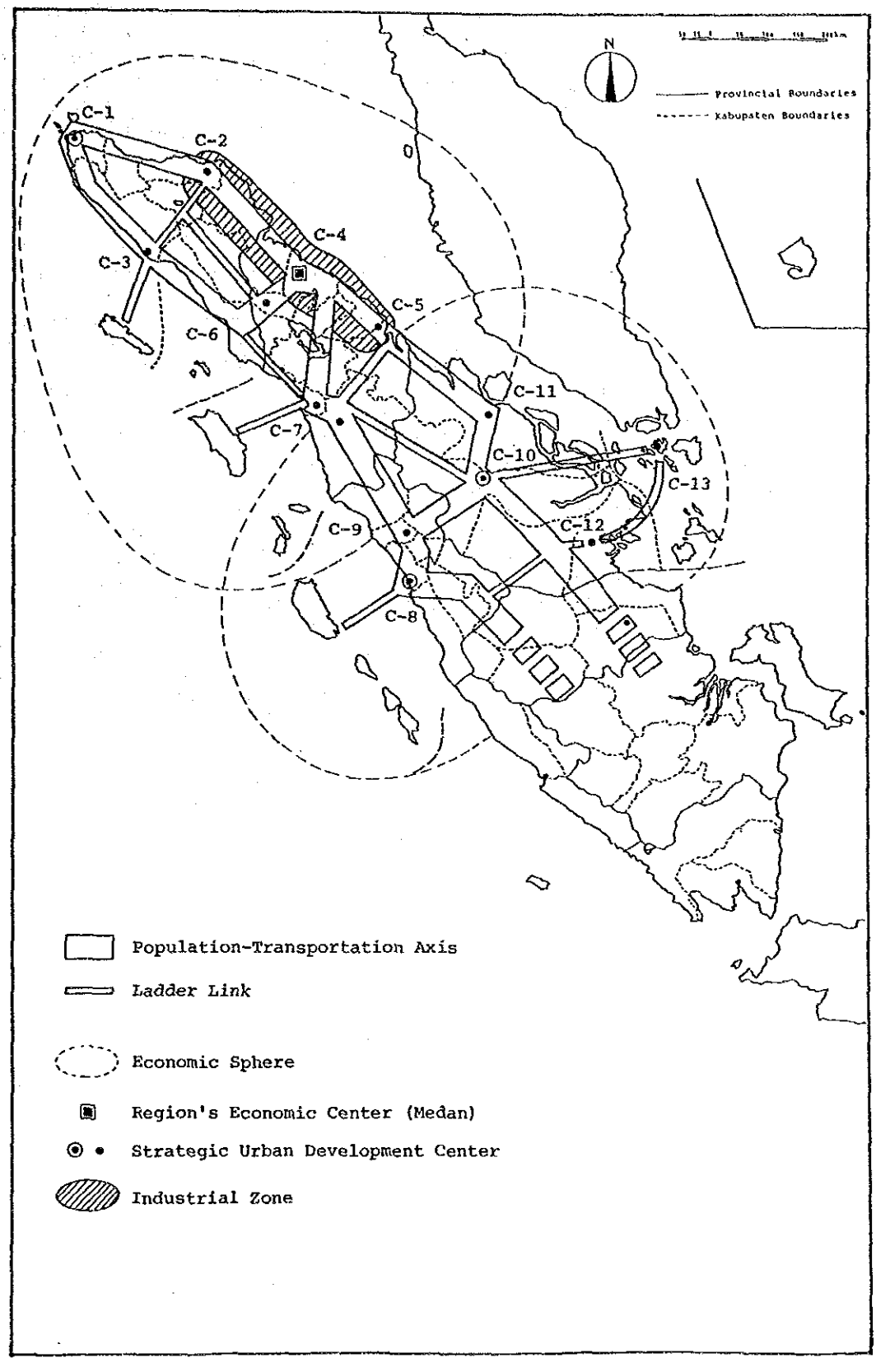
23. Sequential Development Course

In any country or region, proper development follows sequential course: (i) sustained rice production; (ii) agricultural diversification; (iii) agro-industry; and (iv) manufacturing industries. To support this course of development, a minimum level of infrastructure (to provide water, transportation and energy) is essential. Further, due attention should be paid to human resources development. Employment, education and health, among other things, are crucial in achieving a harmonious development. The Region's economy is still dominated by agriculture, sharing 35% of GDP and 62% of employment. But, several urban areas should be noted as manufacturing centers: Lhokseumawe, Medan, Tebin Tinggi, Padang, Pekanbaru, Dumai and Batam Island. The distribution of per capita GDP shows a pattern similar to the current population-transportation axis.

24. Economic Spheres and Future Prospect

Sumatra has not integrated itself yet into one economic region. Instead, there now exist four economic spheres with little interaction among them. They are: northern sphere (Aceh, North Sumatra), central sphere (West Sumatra, Riau), Southern sphere (Jambi, Bengkulu, South Sumatra), and Lampung, which is rather strongly connected to Jakarta forming an economic sphere of its own. In other words, interprovincial linkage is still weak in Sumatra reflecting the low level of industrialization. The current condition will change as economic development quickens its pace. In 2008, after the development strategy is successfully carried out, there will emerge a clear structure of interprovincial linkage on Sumatra, Medan's strong centripetal force that can conjoin the four provinces. The city, largest in Sumatra, will be located at the crossing of the two population-transportation axes as shown in Diagram 8, serving simultaneously as a market, supplier, trader, transit base, and an arena for various social activities. Its strategic implications may be too evident to delve into.

Diagram 8. Spatial Framework (2008)



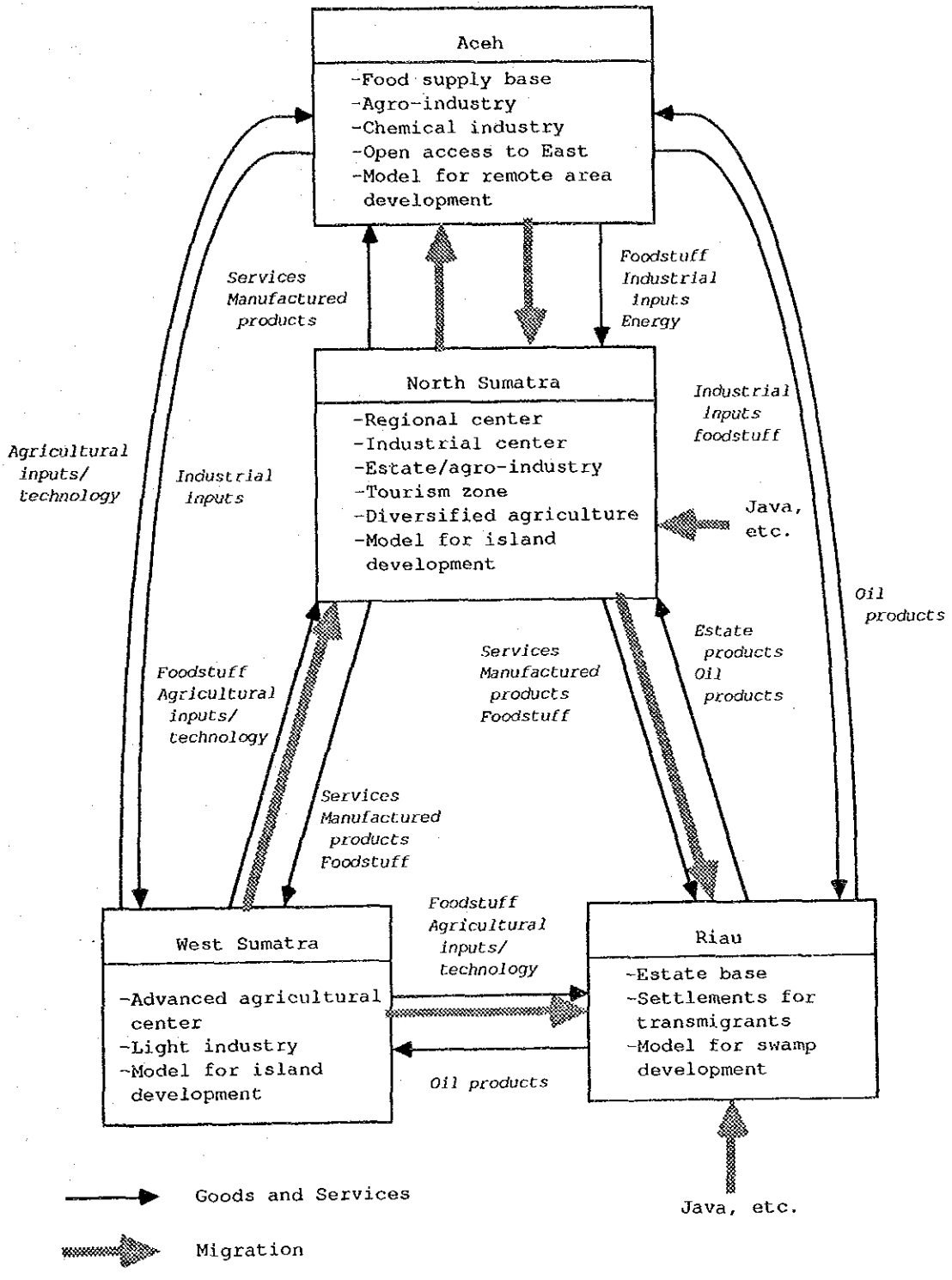
25. Provincial Development Concept

In order to achieve the five development objectives of the Region shown in para. 19 above, the four provinces must take concerted action while making the best use of their own endowments. The provinces, with distinct characteristics and potentials, should each play a role different from others' in the course of development toward 2008. Diagram 9 conceptually specifies each province's role in attaining the overall objectives.

26. Urban-Rural Development Linkage

One of the sub-strategies specified earlier is concerned with space: promoting city-based development while efficiently spreading effects through urban-rural linkages. This is another general strategy concerning space. This strategy is actually two-step and works as follows. Suppose there are a provincial capital, a local city and rural areas surrounding the local city. Then, (i) First, strengthen the capital, the local city and their links; (ii) Second, keeping the local city growing, strengthen linkage between the city and its surrounding rural areas. In this way the cities, more advanced areas, will lead growth while the rural areas are preparing to grow. At a later stage, the advancement will be channeled into the rural aras through the urban-rural linkage. The following 13 cities (or city groups) are considered as strategic development center: (i) Banda Aceh; (ii) Lhokseumawe; (iii) Meulaboh; (iv) Medan; (v) Kisaran/Tanjungbalai; (vi) Kabangjahe; (vii) Sibolga/Padangsidempuan; (viii) Padang; (ix) Bukittinggi; (x) Pekanbaru; (xi) Dumai; (xii) Tembilahan; and (xiii) Batam. This strategy is particularly related to the strategy of population-transportation axes and of urban-rural linkage. The Team identified two axes and strategic urban centers as the bases for development, and those cities' sound economic growth is the critical precondition for the development of remaining areas.

Diagram 9. Provincial Interconnections (2008)



27. Area-based Approach

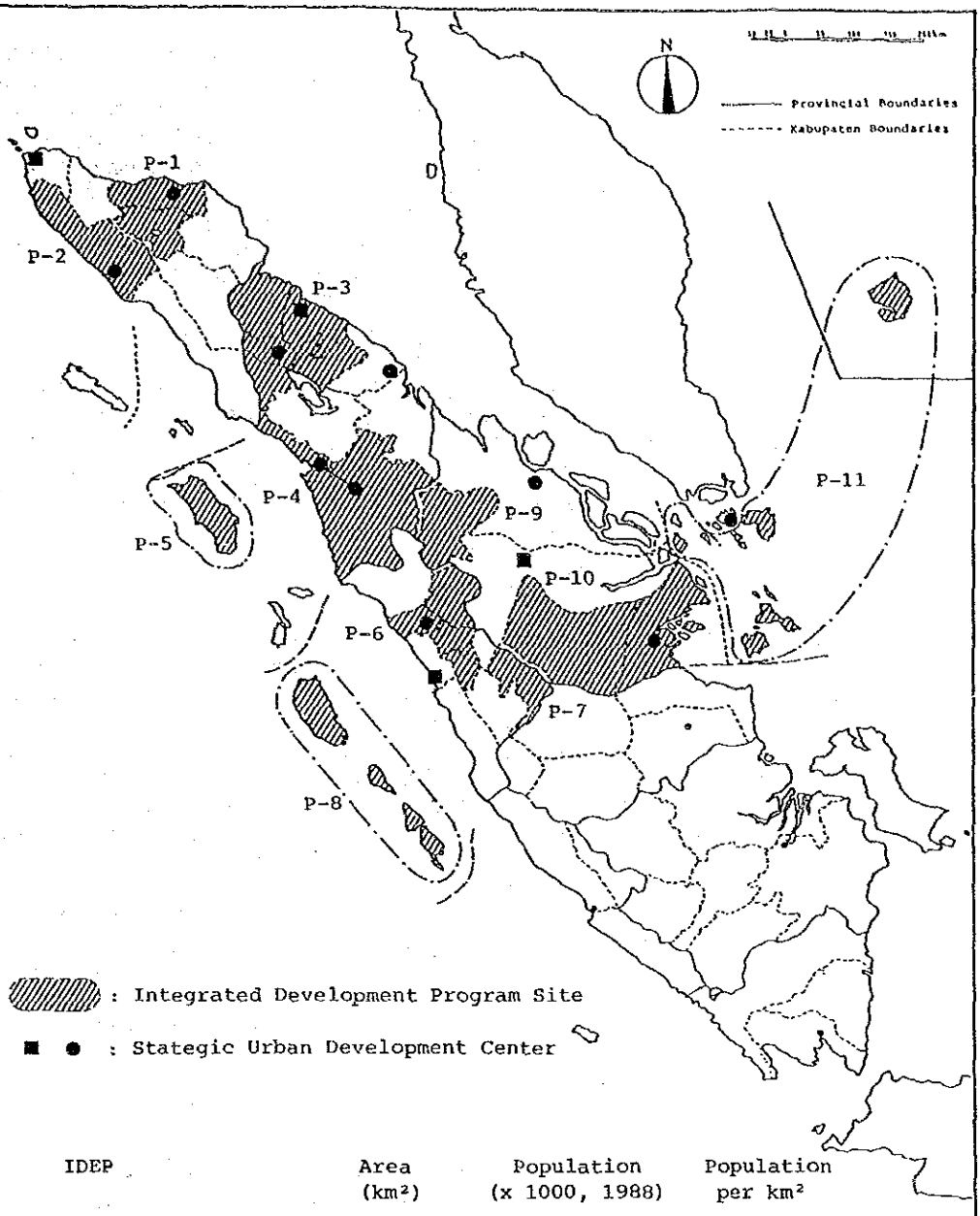
(i) There are two alternative ways of project identification. One is to identify sectoral priority projects first and then organize them intersectorally and spatially. The other way is to pick up some appropriate areas first and then identify sectoral project within them. Given the vast land area of the Region and limited financial resources available for its development, the Team consideres it more efficient to select some areas first and then consider what to do there paying careful attention to intersectoral relations. This approach combines the sectoral and the area development approach. The outcome of this hybrid approach is a program specifically tailored to some area. This program is termed an Integrated Development Program (IDEP) and represents the central concept of the Northern Sumatra Regional Development Plan.

(ii) Thus, an "IDEP" is defined as a group of sectorally integrated priority projects in 11 strategically high development potential areas selected in the Region, to maximize "growth with equity" effects. Diagram 10 indicates geographical distribution of 11 IDEPs. There are another type of high priority projects which are selected outside the 11 IDEP sites in the Region and integrated sectorally and spatially to maximize "growth with equity" effects. These are defined as "outside IDEP projects."

28. West Coast of Sumatra

Six IDEPs out of 11 are selected on or close to the west coast of Sumatra, which is presently less developed compared to the east coast. In addition, it is considered that the west coast will be increasingly important as a gateway of the future West Pacific Economic Zone open to huge potential market of the Indian Ocean surrounded by South Asian, Middle East and African countries. For example, India and Pakistan are already among the five major importing countries of palm oil in the world with EC, US and Japan. It is predicted that several other countries, such as Egypt, Iraq, Turkey, Yemen, Iran, USSR, China and a few African countries, may join this group to obtain this low-price edible oil. Total global demand of edible oil including soybean, palm oil, cononut and cotton seed in the year 2000 with their increasing population will reach 30 million tons per year, more than 50 per cent increase of the present consumption. Then, the west coast of Sumatra may be the nearest exporting base of palm oil to those high-demanding countries provided that the palm oil industry has been well established in the hinterland of the west coast of Sumatra, where six IDEPs are situated. Of course, the present government plan to develop Batam Island as a processing and exporting base for crude palm oil produced in the east coast of Sumatra and Kalimantan should be respected. But if and when such global strategy is called for, serious comparative study will become necessary before long-term policy is determined.

Diagram 10. IDEPs



	IDEP	Area (km²)	Population (x 1000, 1988)	Population per km²
P-1	Northern Aceh	10,330	976	94
P-2	West Aceh	10,097	294	29
P-3	*Metropolitan Medan*	20,690	5,910	286
P-4	West Coast Tapanuli	21,095	1,223	58
P-5	Nias Island	5,318	585	110
P-6	Minang Highlands	10,406	1,611	155
P-7	South Sijunjung	4,259	150	35
P-8	Mentawai Islands	7,018	51	7
P-9	Rokan Basin	6,726	169	25
P-10	*Indragiri River*	27,460	784	29
P-11	Riau Islands	7,487	420	56
	Total	130,886	12,172	93

III. SECTORAL DEVELOPMENT STRATEGY

29. National Strategies for Agriculture

Following the advancement of self-sufficiency in rice in 1985, the government broadened its agricultural development policy to include non-rice food crops (palawija crops) and export-oriented crops. The People's Consultative Assembly in March 1988 designated the agricultural sector as having the highest development priority during Repelita V (1989/90 - 93/94). It says: "Agricultural development, which includes production of food and commercial crops (estates), fisheries, cattle and poultry breeding and farming and forestry, is designed to promote the growth of advanced, efficient and viable agriculture. It aims to increase the yields and quality of production and the income of farmers and fishermen, to expand employment and business opportunities, to support industrial development and to boost exports. The processes of diversification, intensification, extensification and rehabilitation should be implemented in an integrated and proportionate way, having due regard for the soil, water and climatic conditions with a view to the preservation of natural resources and the living environment."

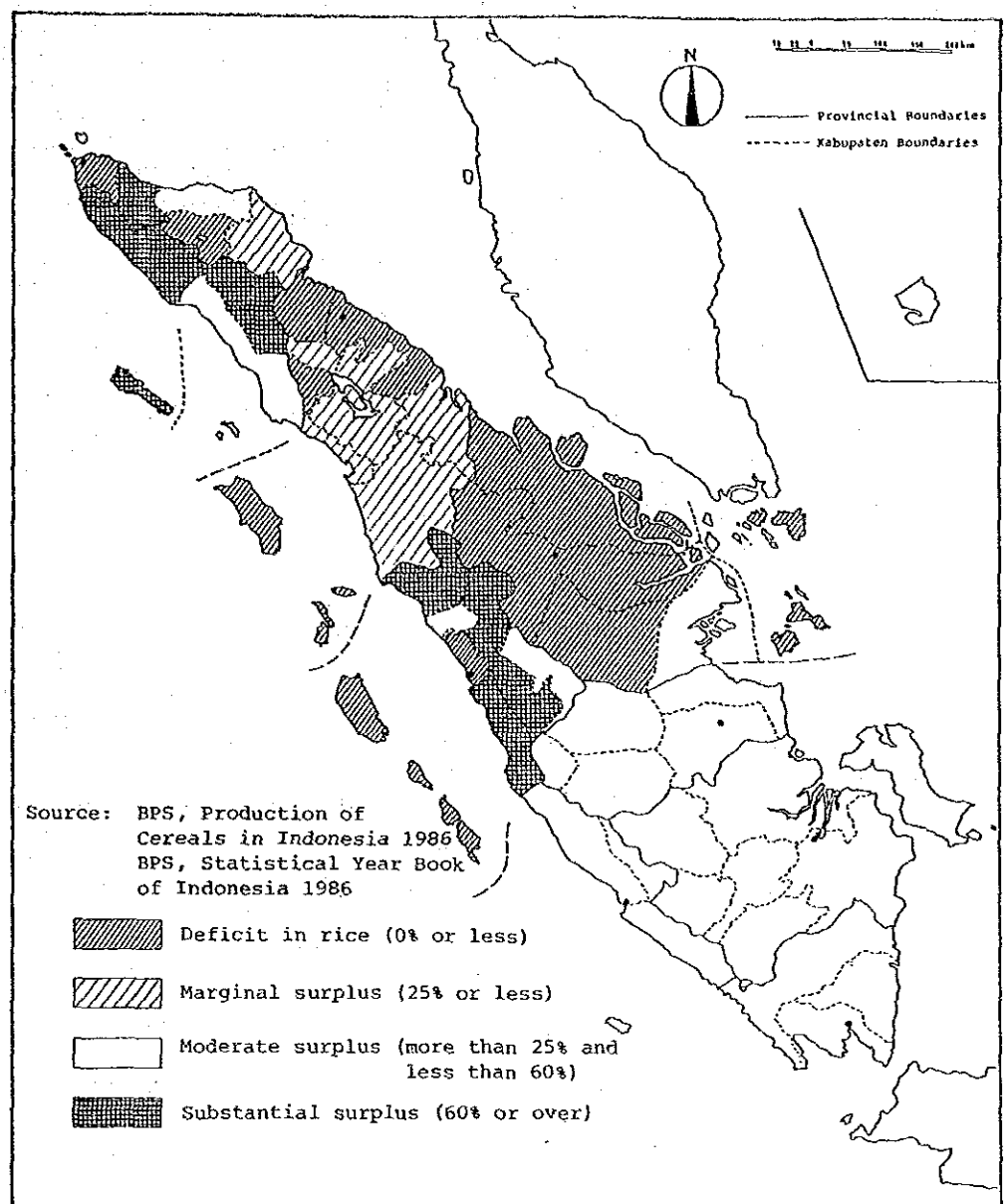
30. Region's Rice Production

In 1986, the Region produced 4.9 million tons of rice (10% surplus). Rice occupies 80% of the total harvested areas of major food crops in the Region, followed by 9% (soybean), 6% (maize) and 5% (others). The demand for rice in the Region is projected to increase from 4.49 million tons in 1986 to 6.86 million tons in 2008, growing 2.3% per annum during 1986-98 and 1.6% during 1998-2008. Assuming a Region's surplus in the range of 0.4-0.5 million tons to be continued, rice production in the Region should increase by 1.9% per annum to 7.35 million tons in 2008. This would require an expansion of irrigation by over 400,000 ha in harvested area, or 20,000 ha per year, which is equivalent to reduced harvest area of rice in Java. By doing so, and with continuous technical improvement, the Region's average yield of rice would grow from 3.8t/ha in 1986 to 4.3t/ha in 2008. The surplus of rice in the Region in 2008 could be about 7%, which will be exported to rice deficit regions such as South Sumatra and Java.

31. Agricultural Diversification

Average per capita calory intake in Indonesia improved from 1,920 Cal/day in 1965 to 2,380 Cal/day in 1982, more than 2,100 Cal/day which is considered nutrition requirement. But average protein intake marginally improved during the same period from 42 grams/day to 51 grams/day which is far short compared to 70 grams/day of the requirement. This implies that Indonesian agriculture should address more to encourage production of protein-oriented food including livestock, fisheries, and diversified food crops such as maize, soybean and pulse both for human and animal consumption. Food crop production in the Region is shown in Diagram 11.

Diagram 11. Food Crop Production



	Wet Paddy	Maize	Soybean	Peanut	Cassava
Aceh	1,024	17	102	16	81
N. Sumatra	1,913	141	28	20	245
W. Sumatra	1,398	22	28	11	108
Riau	292	21	8	4	84
Total (1987)	4,627	201	156	51	518
Total (2008)	7,040	457	344	107	762
Annual (87-98)	2.3	4.0	4.0	4.8	2.9
Growth (%) (98-2008)	1.5	4.5	4.8	5.4	4.1

Note: Wet paddy figures are for 1988.
Source: Tables 12 and 15 in Vol. III.

32. Agro-industry

It is well-known that agriculture is less remunerative industry compared to manufacturing and service sectors. In a long run, it is inevitable that the share of agriculture will decline, without exceptions, in all countries in terms of GDP, export and employment. Unlike NIEs countries, ASEAN countries take some more time to develop manufacturing, but have comparative advantage in agro-industry thanks to abundant natural resources under tropical climate and massive low-cost labor. Taking these advantages, Indonesia should direct to be one of the Newly Agro-Industrializing Economies (NAIEs), which was named for Thailand a few years ago. Horizontal as well as vertical diversification recently introduced to Indonesia would lead to prosperous agro-industries for vegetable oils, starch syrups, tomato ketchup, fruits juice/jam, margarine, soap, assorted livestock feeds, candy/cooky/bread, and even for toilet paper, fish meals and dairy commodities. It was gratified that two Ministers of Agriculture and Industry met on 19 January 1989 for closer cooperation between the two ministries, which remains the most difficult part of ministral coordination in most countries, both developed and developing.

33. Non-oil/gas Export

Dramatic success has been achieved in promoting non-oil/gas export in recent years. Oil/gas export sharing 72.9% of the Indonesian export in 1983/84 declined sharply to 40.0% in 1988/89. The share of agriculture-originated goods (including agricultural products and agro-based manufacturing) increased during this same period from 20.4% to 44.1% of the total export, or from 75% to 73% of the non-oil/gas export. Particularly, plantation crops (palm oil, pepper and rattan) grew remarkably at an annual rate of more than 20% during five years ending 1988/89. Agro-based manufacturing also played significant role, particularly pulp (annual growth rate 72.8%), textile (34.5%), apparel (33.8%) and plywood (23.6%). The Region's contribution to the national export was significant in 1987, accounting for 44% in value of the total export and 21% of the non-oil/gas export of the country. The Relgion's dominant non-oil/gas export commodities include: palm oil (100%), aluminum (94%), rubber (58%), fertilizer (56%), shrimp (24%), coffee (18%), sawn timber (17%) and plywood (14%). Again, it is noted that all are related to agriculture except aluminum and fertilizer. Diagram 12 demonstrates the recent export statistics fom Indonesia.

Diagram 12. Export from Indonesia

Exporting Item	1983/84		1989/90 (Prediction)		Average Annual Increment (%)
	$ million	%	$ million	%	
Oil/gas	14,449	72.9	7,478	40.0	-12.3
(gross oil/oil products)	(12,050)	(60.8)	(5,012)	(26.8)	-16.1
(LNG)	(2,399)	(12.1)	(2,403)	(12.9)	0.0
(LPG)	-		(63)	(0.3)	-
Agricultual Products	2,769	14.0	3,835	20.5	
(log)	(250)	(1.3)	-	(0)	-
(rubber)	(984)	(4.9)	(1,161)	(6.2)	3.4
(coffee)	(506)	(2.6)	(541)	(2.9)	1.4
(tea)	(156)	(0.8)	(131)	(0.7)	-3.5
(palm oil)	(96)	(0.5)	(268)	(1.4)	22.7
(pepper)	(58)	(0.3)	(177)	(1.0)	25.1
(tapioka)	(135)	(0.7)	(203)	(1.1)	8.6
(shrimp)	(276)	(1.4)	(537)	(2.9)	14.2
(rattan)	(87)	(0.4)	(231)	(1.2)	21.7
(others)	(221)	(1.1)	(586)	(3.1)	
Mining Products	800	4.0	1,173	6.3	
(tin)	(309)	(1.6)	(174)	(0.9)	-10.9
(copper)	(88)	(0.4)	(214)	(1.2)	19.5
(alumi-nium)	(165)	(0.8)	(266)	(1.4)	10.0
(nickel)	(162)	(0.8)	(170)	(0.9)	1.0
(gold)	-	(0)	(293)	(1.6)	-
(others)	(76)	(0.4)	(56)	(0.3)	-5.9
Agro-manu-facturing	1,262	6.4	4,421	23.6	
(plywood)	(579)	(2.9)	(2,104)	(11.3)	29.4
(Sawn timber)	(332)	(1.7)	(697)	(3.7)	16.0
(pulp)	(9)	(0)	(137)	(0.7)	72.8
(textile)	(151)	(0.8)	(666)	(3.5)	34.5
(apparel)	(191)	(1.0)	(817)	(4.4)	33.8
Other manu-facturing	536	2.7	1,796	9.6	
(steel)	(4)	(0)	(319)	(1.7)	140.1
(ferti-lizer	(50)	(0.2)	(161)	(0.9)	26.3
(others)	(482)	(2.5)	(1.316)	(7.0)	
Grand Total	19,816	100	18,702	100	-1.1

Source: Repelita V, Indonesia Government

34. Livestock

The livestock subsector in Indonesia is relatively small, accounting for about 10% of the agricultural GDP. The Region's livestock population density is larger than national average in buffalo (particularly in Aceh), pig (N. Sumatra) and broiler (N. Sumatra and Riau), as shown in Diagram 13. The national goals are to increase production for domestic consumption and nutritional improvement and for exports mainly to neighboring countries. The Region is especially slated for commercial farms/ranches to produce pigs, broilers and possibly beef cattle and goats/sheep. The availability of vast grassland in the Region are especially suitable for semi-extensive types of commercial cattle raising for meat production by private investors or by group of local villagers. This calls for the strengthening of extension services for improved livestock management such as nutrition and disease control, on the one hand, and the provision of better infrastructure for handling livestock products such as slaughtering, dairy processing and cold storage facilities, on the other. It would be useful to establish pilot ranches to demonstrate the improved nutrition and disease control, grassland management, and feed grain and forage crop production.

35. Fisheries

The Region's per capita fish consumption in 1987 was established about 23-25 kg, which is over 1.5 times larger than the national average (15 kg). Particularly, the consumption in Riau is 56 kg and in Aceh 32 kg. About 88% of total fish production in the Region is accounted for by marine fishery. The major production area is the east coast of Sumatra, Malacca Straits, which abound in rich nutrient supplied by a number of rivers and good access to the market. However, in view of already too crowded and resource-depleting east coast fishery, future trends would be shifted more to the west coast for under-exploited tuna resources within the 200-mile zone. Diagram 14 indicates the fisheries production in 1988 and its prospect in 2008. It requires substantial strengthening of infrastructures, credit and technical cooperation in both public and private sectors in the west coast. Brackish water pond (tambak) culture has a long history in Aceh. The Region's tambak shrimps to the national total had been increasing from 7.0% in 1982 to 16.3% in 1986. However, recently the world shrimp market deteriorated. It is necessary to produce more economically, through more intensified technology and more extension approach similar to NES (nucleus estate and smallholder) system. Mariculture activities including cage culture, seaweed raft culture and shellfish culture will be emphasized mainly to generate small-scale fishermen's additional income.

Diagram 13. Livestock Population

(1987)

	Aceh	N. Sumatra	W. Sumatra	Riau	(A) Region	(B) Indonesia	(A)/(B) (%)
Dairy cattle	0	6	2	0	8	225	3.5
Cattle	408	161	354	66	989	9,616	10.2
Buffalo	470	188	173	38	868	3,287	26.3
Pig	9	1,249	23	36	1,317	6,215	21.0
Goat/sheep	471	377	223	138	1,208	15,379	7.9
Layer	141	2,081	1,629	520	4,371	38,688	11.3
Broiler	67	2,127	2,177	2,177	4,371	19,197	22.7
Native Chicken	8,095	9,982		2,326	22,580	162,991	13.9

Sources: Direktorat Jenderal Pertemakan, Statistical Book on Livestock 1988
BPS, Pengeluaran untuk Konsumi Penduduk Indonesia per Provinsi 1987

Diagram 14. Fisheries Production

(1000 mt)

	1988	2008
Marine (East)	339	384
Marine (West)	121	368
Inland Fishery	24	24
Aquaculture	40	105
Total Production	524	921
Consumption	460	701
Consumption/cap (kg)	23	23
Export	70	257

Source: Directorate General of Fisheries

36. Water Resources Development

The Region is endowed with abundant water resources with annual rainfall averaging 1,500 - 5,000 mm. In order to make maximum utilization of water, it is essential to have a comprehensive basin master plan in each major river basin. The rainfall pattern has double peaks in April - May and October - December, which facilitate perennial estate crops and double cropping with minimum irrigation. On the other hand, habitual inundation area extend to 230,000 ha in N. Sumatra, 94,000 ha in Riau, 48,000 ha in Aceh and 3,000 ha in W. Sumatra. The Law No. 11, 1974 stipulates the priority order of water use as follows: (i) drinking water, domestic use, national defence and security, religious purposes and municipal use; (ii) agriculture, animal husbandry, plantation and fishery; and (iii) energy, industry, mining, water-traffic and recreation. Diagram 15 indicates the water resources development in 1988 and its prospect in 2008.

37. Irrigation

In order to maintain a 7% surplus of rice production, irrigation requires for around 400,000 ha (in harvested area) for 20 years. However, irrigation development in future should follow a set of new policies. First, the irrigation system should be designed not only for rice but for palawija crops. Second, the irrigation system should be managed, operated and maintained by the farmers. Third, the irrigation system should give socio-economic impact in the remote areas including fisheries and miscellaneous purposes. Fourth, the irrigation system should also help new transmigrant for sustaining their livelihood. Proper management of water should be considered for increasing aquaculture.

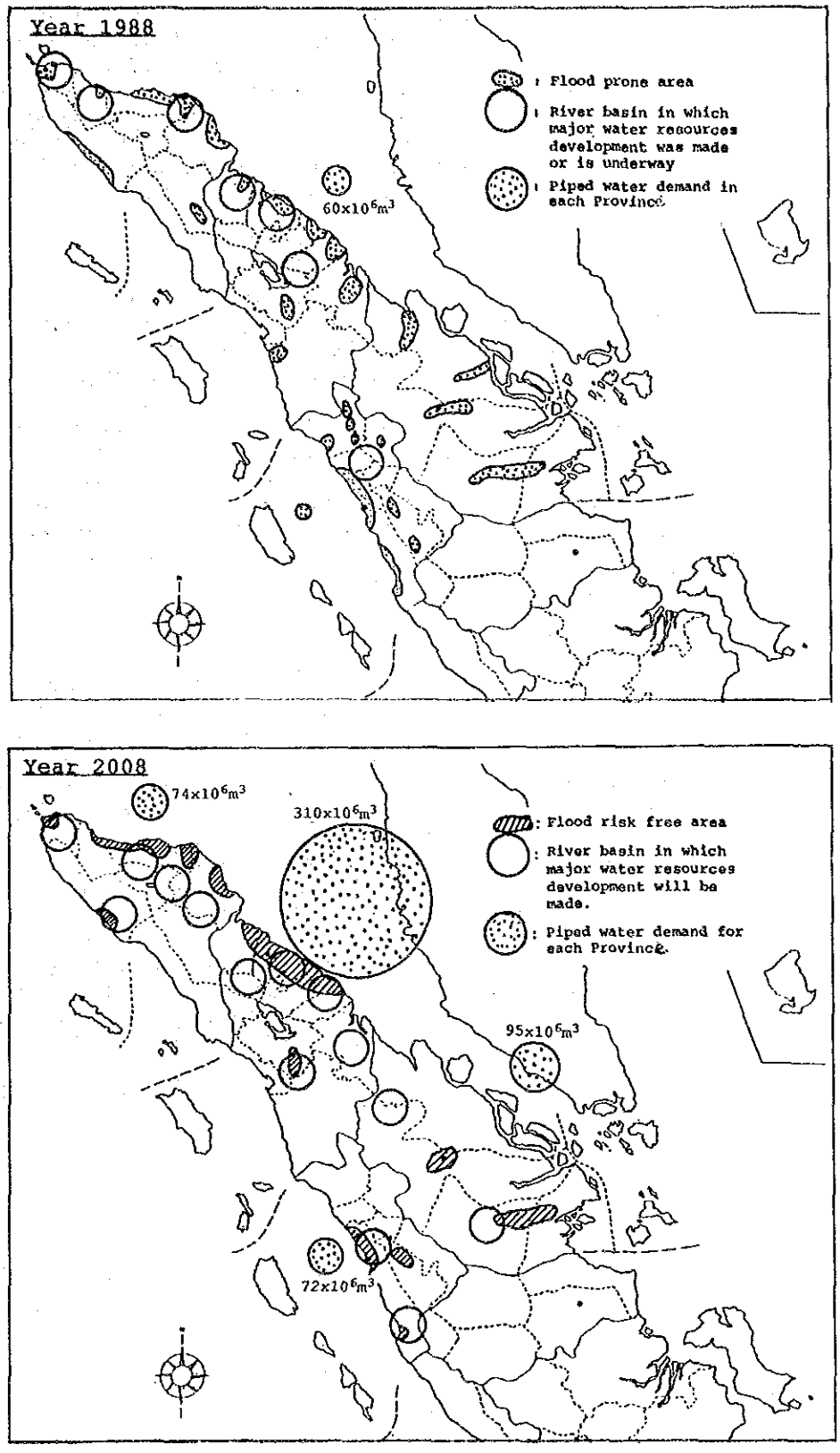
38. Hydropower

Hydropower is a clean and sustained energy source and therefore, should be encouraged to develop as long as economically justifiable. A large potential of hydropower has remained untapped in the Region, except for the Asahan No. 2 (603 MW), Maninjau (68 MW) and Batang Agam (10.5 MW). So far, 359 schemes were identified in the Region. More than 50 mini-hydropower sites (less than 5,000 kW of capacity) were identified in Aceh and N. Sumatra. These schemes would make a contribution to the rural electrification programs in isolated locations and encourage local industries.

39. Drinking Water

In urban and suburban areas, 20 to 40% of household are supplied with piped water from spring, wells or streams. The piped water demand in the Region in 2008 is provisionally estimated at 554 million m^3 (17.6 m^3/s), including urban use (331 million m^3) and rural use (223 million m^3). A new enterpreneur of selling abundant and high-quality water may interest public as well as water shortage countries.

Diagram 15. Water Resources Development Prospect



40. Oil and Gas

Indonesia maintains to produce annually around 500 million barrels of crude oil including condensate, while it culminated at 615 million barrels in 1977. The Region accumulated export 7,011 million barrels during the period from 1941 to 1986, which accounted for about 60% of the total cumulative production in Indonesia. This position will continue unchanged as the remaining recoverable reserves are estimated at 64% of the total of Indonesia. The production of natural gas in the Region accounting for 878 billion cubic feets in 1987, which shared 51% of the country's total production.

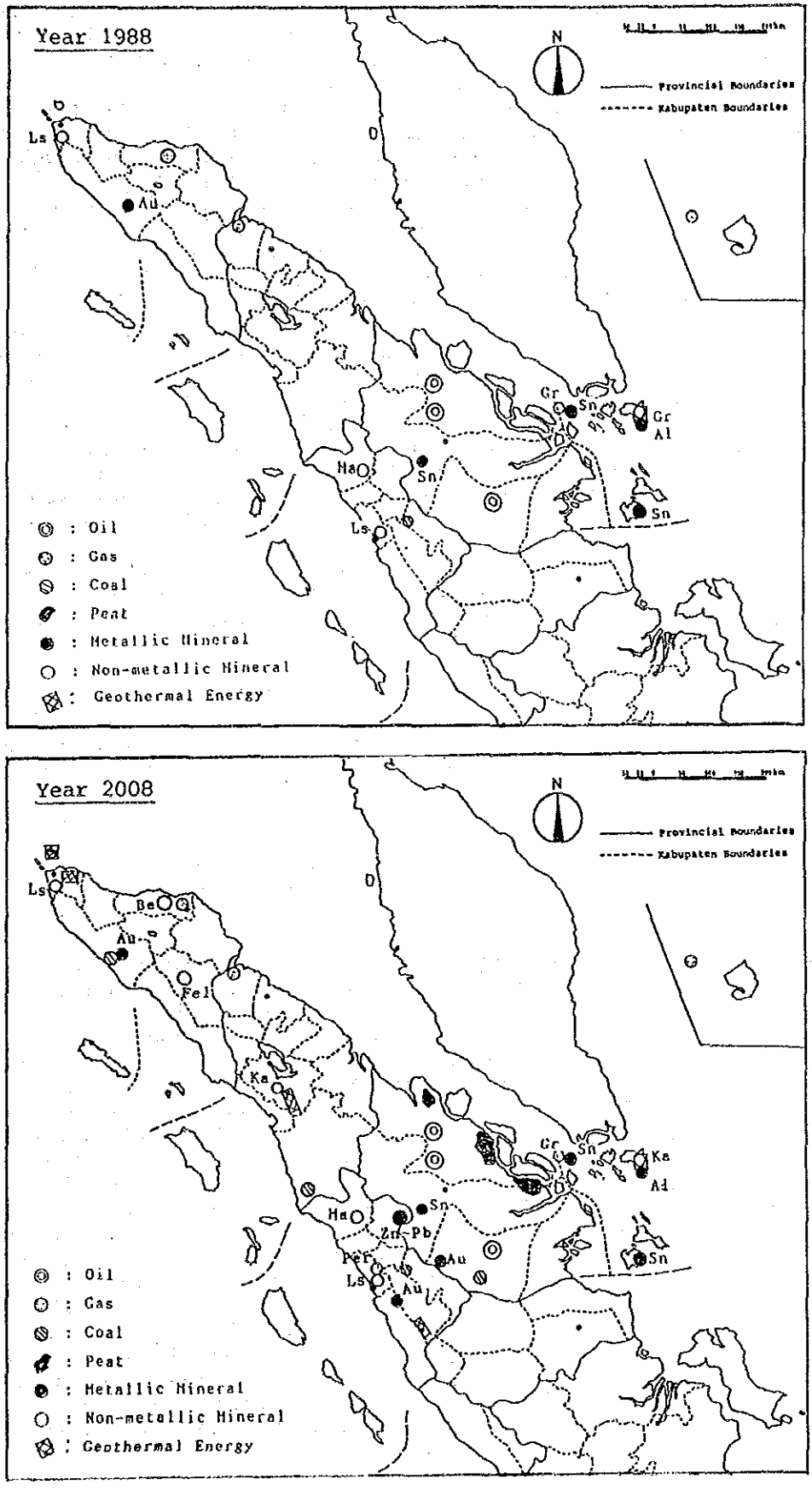
41. Coal

In order to conserve the limited oil/gas as energy resources, coal mining is revitalized recently. Ombilin coal mine produced 3.8 million tons in total during the period from 1977 to 1987 and is presently operating annually 0.7 million tons, and will produce 1.5 million tons annually in future for domestic industry and export. High potential coal deposits identified in the Region are Rokan, Logas and Cerenti (expected more than 1 billion tons) in Riau, Sinamar (80 million tons) in West Sumatra, and Meulaboh (505 million tons) in Aceh. A new coal deposit was recently discovered at south of Natal in North Sumatra, in view of long gestation period required for actual exploitation, systematic exploration program is essential to meet the nation's energy policy.

42. Other Mining Resources

Geothermal potentials observed along the Barisan Range may be suitable as a local energy source and multipurpose use of the steam and hot water to develop medium-scale industry, tourism, health and rehabilitation. However, some experienses of completed geothermal stations such as Kamojang in West Java would be useful, before a full-scale reconnaissance survey is initiated. Huge amount of peat deposits located in the swamp area of Riau may also be noted as a future energy source, though very careful assessments are required from agricultural as well as environmental angles. Various kinds of metallic as well as non-metallic minerals are also promising, but no detailed survey has been performed to define their quality, quantity and marketing prospect. It may be a good starting point to strengthen an existing laboratory facility in Medan to enable for research and development work for non-metallic mineral resources. Diagram 16 demonstrates the mining development in 1988 and its prospect in 2008.

Diagram 16. Mining Development Prospect



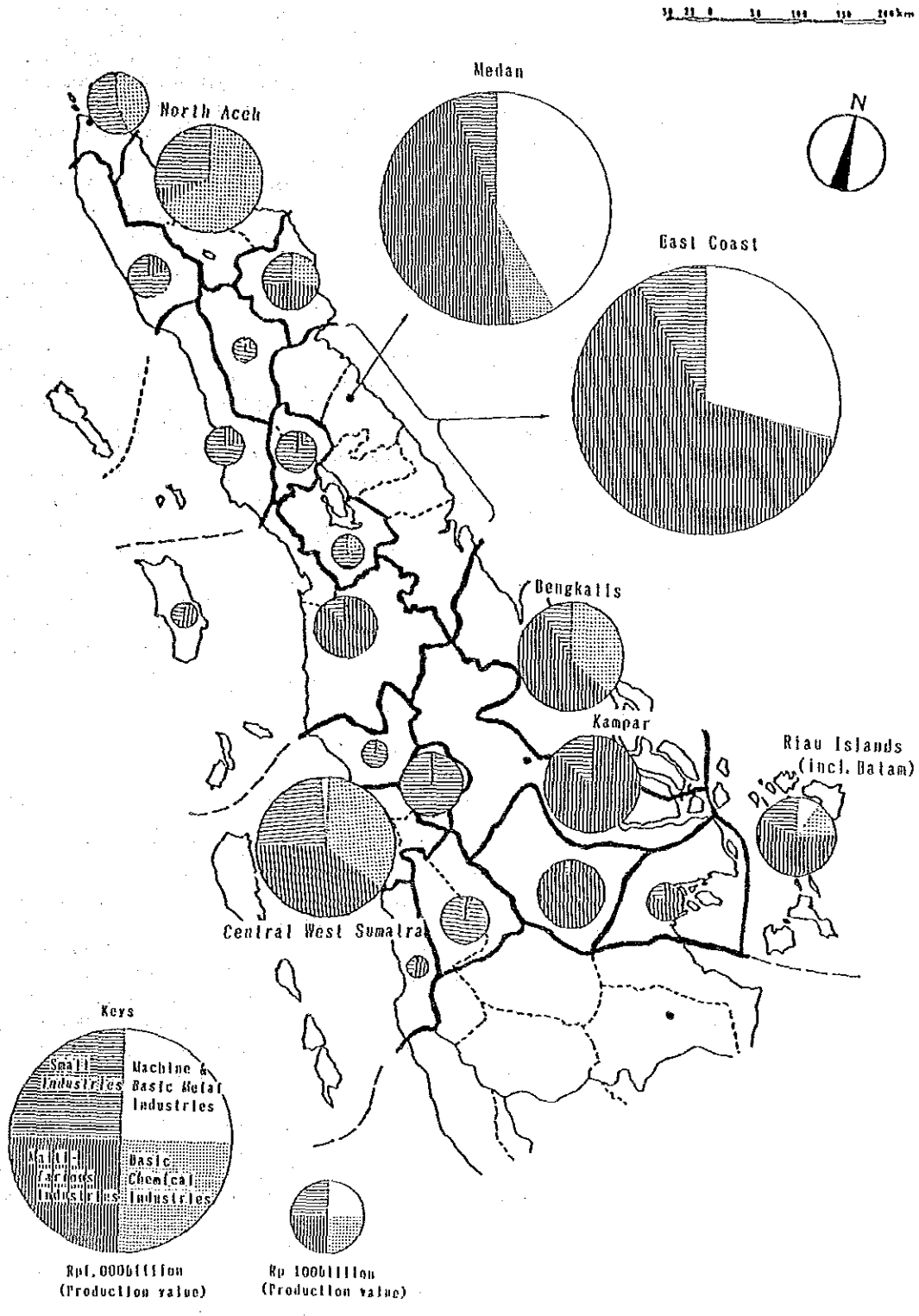
43. Largest Industrial Base Outside Java

Industrial development of some significance took place in the Region only recently. Until the early 1980s, industries in the Region were confined virtually to traditional small-scale industries. Having achieved dynamic growth in the past decades, the Region is the largest industrial base outside Java today. In N. Sumatra Province, the number of industrial establishments grew 4.4 times, employment 2.3 folds, value of production 3.7 times during the 9-year period since 1978/79. While the Region's population is 11.4% of the national total, it accounts for 13.2% of the manufacturing value added (excluding oil and gas) of the country in 1988. The Region accommodates an impressive number of industries of the national importance, such as cement, fertilizer, aluminum articles, pulp and paper, palm oil, rubber processing, fish processing, and some engineering products. Most of them are manufacturing based on the marketing conditions and locally available human and natural resources including oil, gas and other minerals, forestry, marine and energy resources, as well as favorable conditions for tropical agriculture. The Region will continue to enjoy this advantage. Medan, the largest city of the Region, will continue to be the Region's center of supporting industries which provides capital goods (machines, office equipment, parts for machines), intermediate goods (parts for final products), final goods (tools, stationary) and services (banking, telecommunication, repair service, shipping agents) to other industries. Promotion of small industries is another important strategy, since it absorbs employment scattering in the cities, villages and remote areas. Diagram 17 indicates the industry development in 1987.

44. Future Prospects of Industry Development

It should be recognized, however, that the Region has some disadvantages, particularly in competing with industries in Java. First, long distance to the 100 million population market (Java). Second, inconvenient access to foreign markets which require efficient services, administrative, financial, testing and research. Third, inadequate infrastructures such as electricity telecommunication, transportation, water, education and health facilities. Fourth, insufficient supply of skilled and semi-skilled labor force. Fifth, government regulations and price control which have tended to favor industries close to Jakarta. Against these problems, the Government has recently made drastic policy changes to create favorable climate conducive to private enterprises, deregulate production, investment, transportation and financial and banking sectors, and encourage more market-oriented industries. International financial climate is also changing in favor of Indonesian economy. For example, the World Bank established the Multilateral Investment Guarantee Agency (MIGA) to alleviate risks of international investment. The Japanese Government recently supported to establish the Japan International Development Organization (JAIDO) to assist private investment in export-oriented industrial projects. Further government's effort is urgently required to attract domestic and international private investors, particularly in this crucial timing, when the increasing wage level and other circumstances in the newly industrializing areas such as Thailand, Malaysia and Java, make slow down their growth to the near saturation points. In deciding industrial projects, it would be worth to support highly competitive industries such as; (i) forest products; (ii) estate products; (iii) food processing; (iv) sea fishery processing; (v) livestock processing; (vi) mineral processing; (vii) textile; (viii) ceramics; (ix) glass; and (x) metallic industries.

Diagram 17. Industry Development (1987)



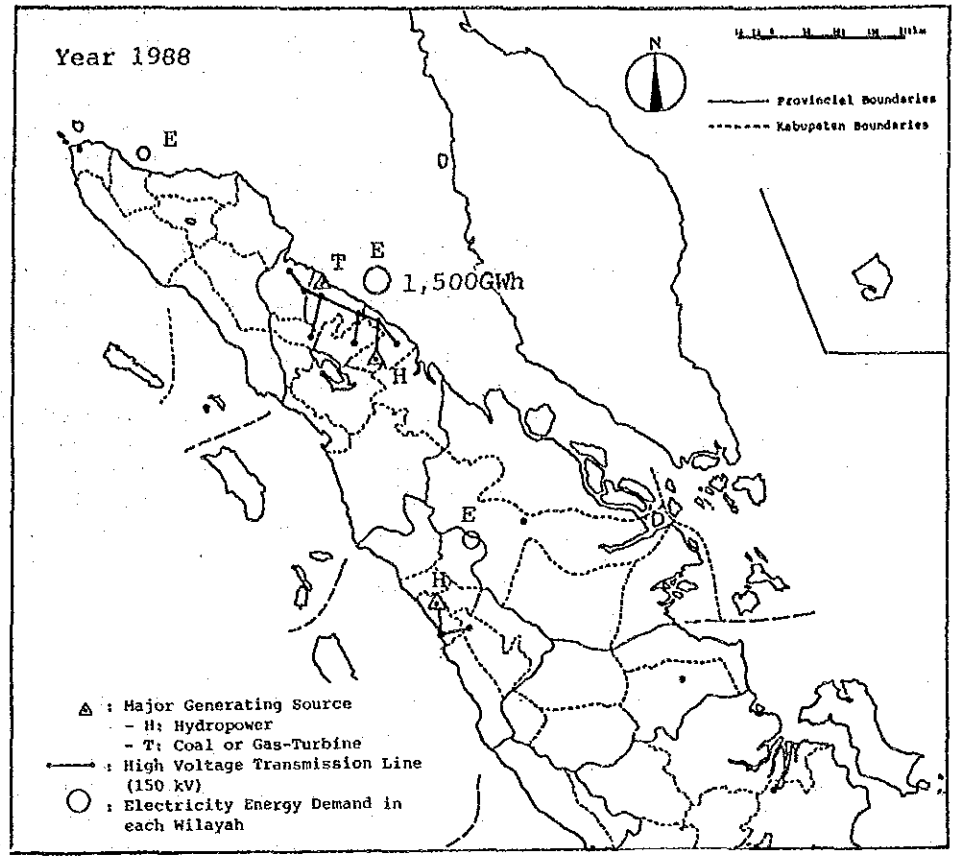
45. Commercial Energy

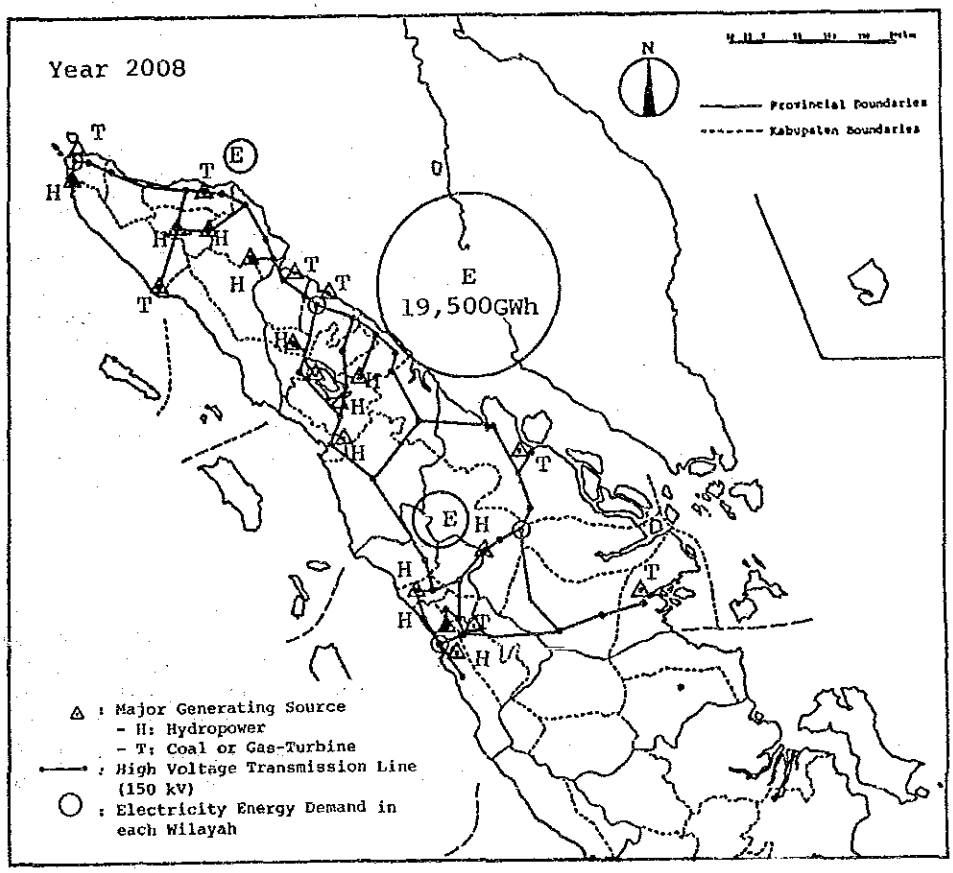
In 1985, the total commercial energy consumption in the Region was estimated at 20,587 KBOE (Thousand Barrels of Oil Equivalent), consisting of: petroleum products 17,665 KBOE (88.3%), natural gas 366 KBOE (1.8%), coal 1,911 KBOE (9.6%) and electricity 64 KBOE (0.3%). This compares to the nation-wide sharing of commercial energy consisting oil and gas (91%), coal (2%) and hydropower (7%). Given the known reserve of fossil fuels, it is envisaged that natual gas, hydropower and coal will play significant roles in the future. The national energy source mix by the year 2000 is expected to be about 78% of oil and gas, 18% coal, 3% hydropower, 1% geothermal energy and 0.2% non-conventional sources. According to the Team's estimation based on the past experiences in NIEs and Japan, the Region's commercial energy consumption in 2008, would increase to 113,000 KBOE, 4.6 times of the 1988's figure. For the electricity, the consumption is projected to grow from 2,133 GWh to 25,160 GWh, 11.8 times at an annual growth rate of 13.7% during the 20 years. For this projected annual energy requirement of 25,000 GWh in 2008, the required installed capacity is approximated at 5,800 MW, which is about 6 times the aggregate capacity (967 MW) in 1988. Since the plan, which is already or almost committed for installation, is 1,490 MW of hydropower, 350 MW of coal-fired plant and 217 MW of gas turbine and gasfire, being 2,057 MW in total about 3,700 MW of new plants should be additionally developed for the coming period of 20 years. With the discovery of natural gas at offshore of Pangkalan Brandan and Natuna, natural gas development is in view and it becomes possible to replace a part of projected petroleum product consumption. It is expected to start production at the end of Repelita V (1989/90 - 93/94). Another possibility may be explored in the Indragiri River IDEP as to whether peat soil can be a new energy source. Diagram 18 indicates the energy development in 1988 and its prospect in 2008.

46. Traditional Energy

Although there are no reliable data, the total tradditional energy use in the Region, mainly fuel woods and charcoal for household and small-insustry consumption, is estimated at 16,005 KBOE, which reached nearly 80% as large as total commercial energy, or about 90% of petroleum products. Given the estimated population growth and the increase of per capital consumption, the sustainability of the current fuel wood situation is questionable. It may not be easy to envisage that the transition from traditional to commercial energy will take place next 10 years. In these circumstances, efforts should be directed to enhance the thermal efficiency in fuelwood use in the rural household. The currently used fuelwood stoves are the open fired type with extremely low energy efficiency (5 - 8%), in comparison to 24% by the efficiency improved stove. With the dissemination of the improved stove, the current level of fuelwood consumtption is possible to be reduced to 1/2 or 1/3. The work load of women and children to collect fuelwood (6.6 manhours/week) and to cook (4.2 manhours/day) would be largely saved for other works or study.

Diagram 18. Energy Development Prospect





47. Background of Transportation Development

Being an archipelagic country consisting of more than 13,000 islands stretching over a length of 5,000 km, Indonesia needs more well organized transportation and communication system than other countries. The Region's transportation system was developed in the early 20th century under the colonial economy focusing on international marketing of estate crops such as rubber, coconut and palm oil. Even after the independence, the transportation network was developed centered around provincial major cities without considering socio-economic integration and sectoral linkages of the entire Region. The first and only remarkable event in the transportation development in the Region was the opening of the Trans-Sumatra Highway in 1984, which formed a backbone of the Region's economic development. Transportation development should be planned in conjunction with other productive sectors. On the other hand, improvement on transportation facility creates regional development effects on surrounding areas. These interdependence among socio-economic sectors within and outside the Region should be carefully taken into account, and different modes of transportation (road, railway, water and air transportation) should be compared during the planning stage, so that the maximum economy and efficiency can be attained. Diagram 19 demonstrates the transportation development corridors for future planning.

48. Railway Transportation

Two separate networks of railways -- one is 1,052 km in N. Sumatra and the other is 284 km in W. Sumatra -- exist in the Region for the purpose of bulky transportation of plantation crops and coal, respectively. Most of the locomotives are out-dated model with more than 35 years old and the railway-related facilities and equipment are deteriorated. A fresh look would be urgently required whether they should be revitalized or replaced by some other mode of transportation.

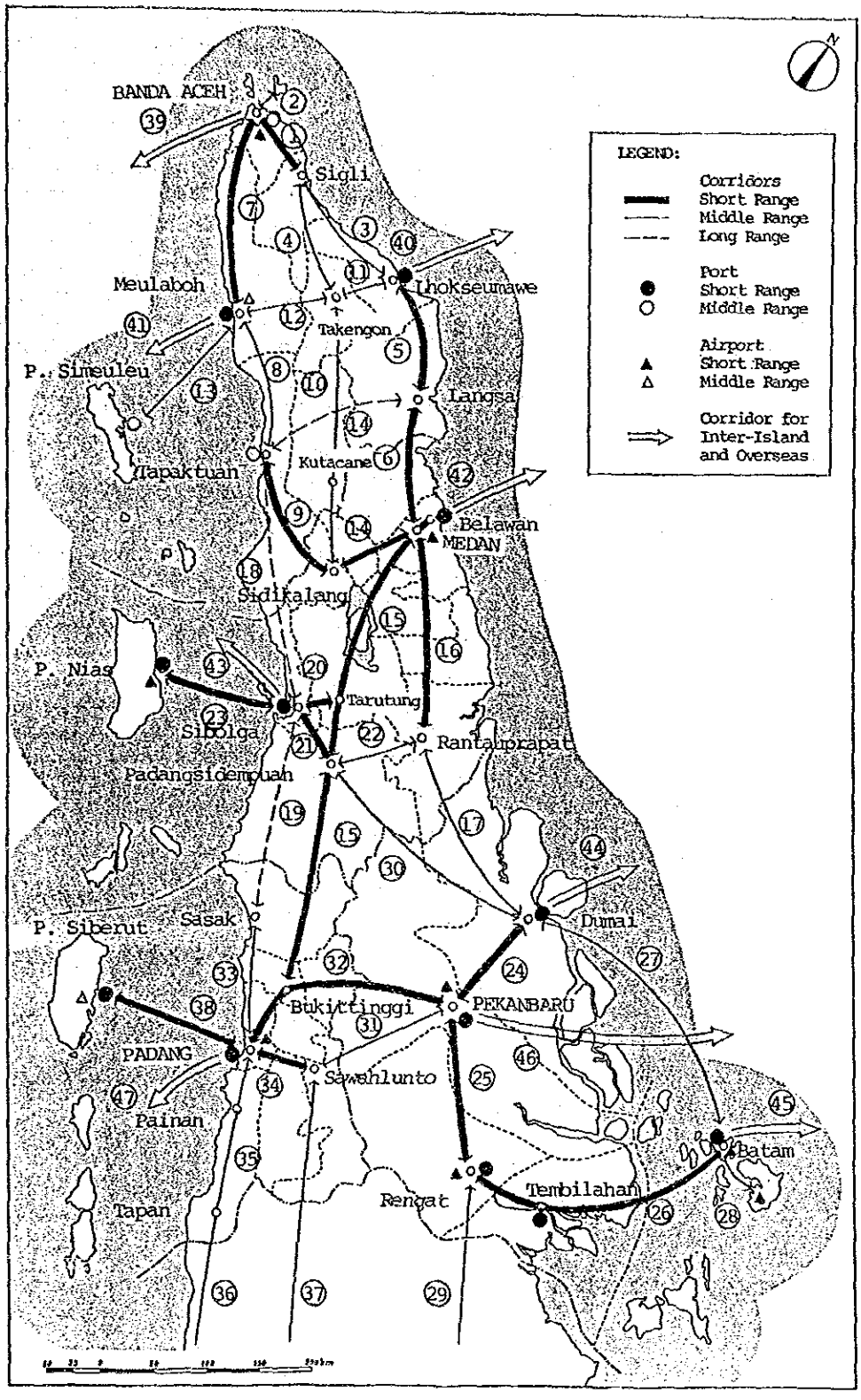
49. Water Transportation

There are 12 major ports in the Region. Reflecting the present economic development and geographical closeness to Singapore and Malaysia, nine of the 12 ports are situated on the east side of the Region. They are: Belawan, Lhokseumawe, Dumai, Malahayati, Langsa, Pekanbaru, Tembilahan, Batam and Tanjung Pinang. Only three ports, Telukbayur, Meulaboh and Sibolga are on the west coast. Expansion of port facilities (berth, yard, etc.) for commercial ports should be carefully planned based on realistic demand forecast and alternative studies. In this context, it is likely that more port facilities are required toward the 21st century, when the West Pacific Economic Zone is formed and the west coast should play a crucial role as a gate way to those countries surrounding the Indian Ocean, Middle-East, African Continent and the European Economic Zone in the near future.

50. Air Transportation

In addition to five major airports (Medan, Padang, Pekanbaru, Banda Aceh and Batam) which are operated with daily scheduled flights, there are one feeder airport (Rengat) and 12 municipal pioneer airports in the Region. The future development strategy would be: expansion of airport facilities for the accommodation of larger aircraft and modernization of safety control system, more frequent flight services to isolated areas and more efficient services to the passengers.

Diagram 19. Transportation Development Corridors



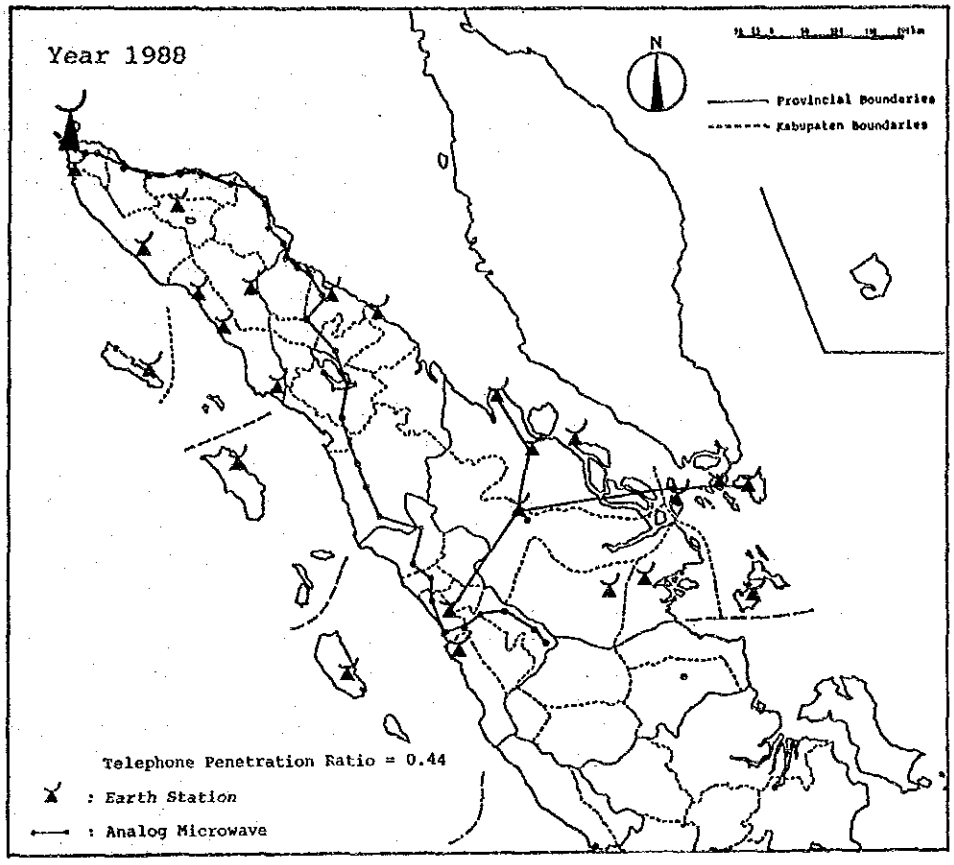
51. Current Telecommunication Facilities

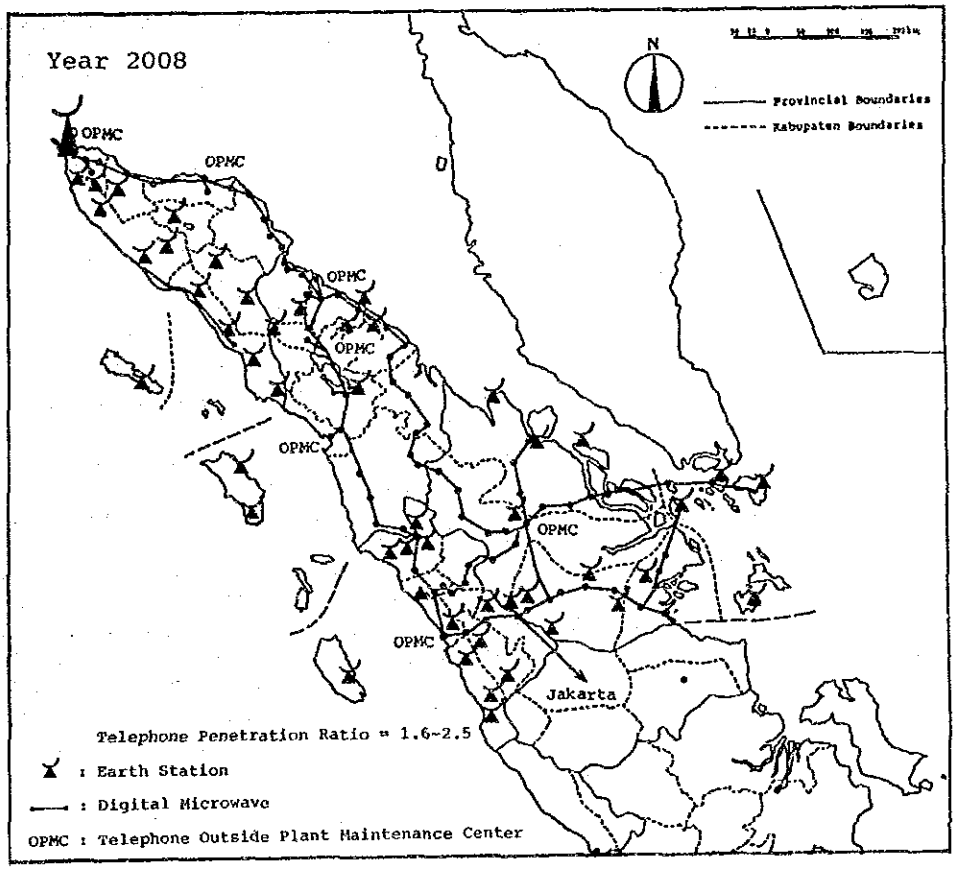
In Indonesia, the telecommunication sector has made a significant progress in terms of number of telephone subscribers, a 10% annual increase during the last 10 years. Nevertheless, the telephone penetration ratio still remains 0.4, the lowest among the ASEAN countries (Singapore 32.5, Malaysia 6.3, Thailand 1.5, the Philippines 1.0). The target of 0.9 penetration ratio during Repelita IV was not achieved. While the rate of automization of switching equipment is high, the rate of automization of switching centers is low (the Region 28.6%, Indonesia 40.0%). It is difficult for many subscribers to make a long distance call by means of direct dialing. There are still many waiting applicants for subscription of telephone in large and medium switching centers in the Region even in Medan, Batam, Banda Aceh, Pekanbaru and Padang. The installation rate of 11 major cities is 68%. On the other hand, there are many kecamatan in the Region which have no telephone services at all.

52. Improvement of Telecommunication System

First of all, the telephone penetration ratio should be increased at least to 1.0, comparable to other ASEAN countries. On the other hand, it is also important to lessen disparities between urban and rural societies, although the construction cost in rural areas are normally twice as much as that in urban areas. Planned production of agriculture and industry may be possible by linking the productive base to the consuming area by telecommunication lines. The extension and expansion of telecommunication networks may also help develop education, social activities and medical services. In addition to the physical improvement, software improvement is also important to save cost and increase efficiency. When a duct is built, a road must be excavated. It is getting difficult to obtain digging permits from city authorities and thus the construction period is prolonged. It is necessary to hold a coordination meeting between the local government and PERUMTEL with regard to the excavation of ducts. Efforts should be given to improvement of service quality, development of manpower for the purpose of preparing to establish a digital network, and imporvement of operation and maintenance capability. Diagram 20 indicates the telecommunication development in 1988 and its prospect in 2008.

Diagram 20. Telecommunication Development Prospect





53. Land Use Maps and Land Classification

There are several sources of land use map, such as BAKOSURVANAL Geography Department (offset color at 1:250,000 scale), AGRARIA (maps of various scales), Center for Soil Research (maps at 1:500,000 and 1:250,000). There are many inconsistencies, because they were prepared for different purposes at different times. The Team consolidated them based on land use maps prepared by interpreting the most recent LANDSAT images and other reliable data collected during the Study. Diagram 21 summarizes the outcome, although still discrepancies are found here and there. Generally speaking, there exists considerable danger of soil erosion and over-cutting of permanent forests in North Sumatra while relatively large potential areas for development still remain in Aceh and Riau. More careful and intensive land use is required in North Sumatra.

54. Forestry Production and Protection

On one hand, forestry production should be continued to meet industrial and energy needs by way of better management of productive forests. But on the other hand, forests, as a decisive element in the ecosystem and renewable natural resources, play a major role in sustaining environment including land, water, air and climate, and subsequently benefit society. All development efforts should be carried out in a balanced way, whereby sectoral and regional targets are best achieved and the environment is preserved in a long run. In this context, it should be noted that the concerned ministries reached the Consensus of Land Utilization Design based on forest land use in May 1984, which is summarized in Diagram 22. TPI (selective cutting system) is generally observed in Indonesia to serve this purpose. Maximum annual cutting in the Region is 12.05 million m^3, which accounts for 16.0% of maximum annual allowable cutting in Indonesia of 75.24 million m^3. In June 1987, the World Bank appraised a major project including watershed protection and a long-term forest resource inventory. FAO/UNDP is giving support to forestry sector development planning. It is premature to judge how and where the forest development in the Region can be started until the forestry inventory is completed.

55. Environmental Conservation

A Government Regulation of the Republic of Indonesia (No. 29, year 1986) pertaining to analysis of impacts upon the environment stipulates that all development projects take environmental aspects into consideration. The most serious environmental issue in the Region is watershed management. At present, eight watersheds covering 3,117 km^2 or about 12% of the Region are considered to have the most critical lands. Some experimental watershed management projects are under implementation to identify a model development methodology. The Region is blessed with rich aquatic resources, which are often threatened by declining water quality, habitant alterations and sedimentation. The Region is endowed with the richest biological and animal diversity in Indonesia. While the development progressed, some protected animals such as elephant damage the agricultual products especially in Aceh and Riau. Lastly, a few pollution issues should be noted in the Region. Examples are: air quality pollution by dust discharge from a cement factory in Padang, water quality pollution by discharging waste water at the Ombilin coal mine and by discharging untreated water from pulp and paper, oil palm processing factories.

Diagram 21. Current Land Use

1,000 ha

	Aceh	N. Sumatra	W. Sumatra	Riau	Total
Forest [1]	3,645 (66%)	2,491 (35%)	2,631 (62%)	5,820 (62%)	14,587 (55%)
Agri-cultural Land [2]	600 (11%)	2,412 (34%)	547 (13%)	1,023 (11%)	4,582 (17%)
Others [3]	1,294 (23%)	2,265 (31%)	1,052 (25%)	2,613 (27%)	7,227 (28%)
Total	5,539 (100%)	7,168 (100%)	4,230 (100%)	9,456 (100%)	26,393 (100%)

1) Various types of primary forest including mangrove
2) Permanent cultivated land including paddy, upland and plantation
3) Other lands including secondary forest, bush/scrub, grassland shifting cultivation, rivers, lakes, beaches and dunes

Source: Compiled by the Team based on the most recent Landsat images and "Regional Physical Planning Program for Transmigration (Re PPProt) Project", Ministry of Transmigration, 1988.

Diagram 22. Agreed Forestry Function Areas in the Region

Title	Area (1,000 ha)	Function	Permitted Exploitation
Nature Reserves	1,932	Genetic conservation, recreation	None
Protection Forest	4,179	Watershed protection	None
Limited Production Forest	5,086	Timber production	Selective felling
Normal Production Forest	3,191	Timer production	Controlled clear felling
Convertible Forest	5,706	Timber production conversion to agriculture	Clear felling
Total	20,094		

Source: Data Popok Untuk Pembangunan, DI Aceh, Sumatra Utara, Sumatra Barat, Riau, Directorat Tata Guna Tanah, Directorat Jenderal Agraria, Kantor Statistik Dan Bappeda, 1986, Propinsi Dalam Angka, DI Aceh, Sumatra Utara, Sumatra Barat, Riau.

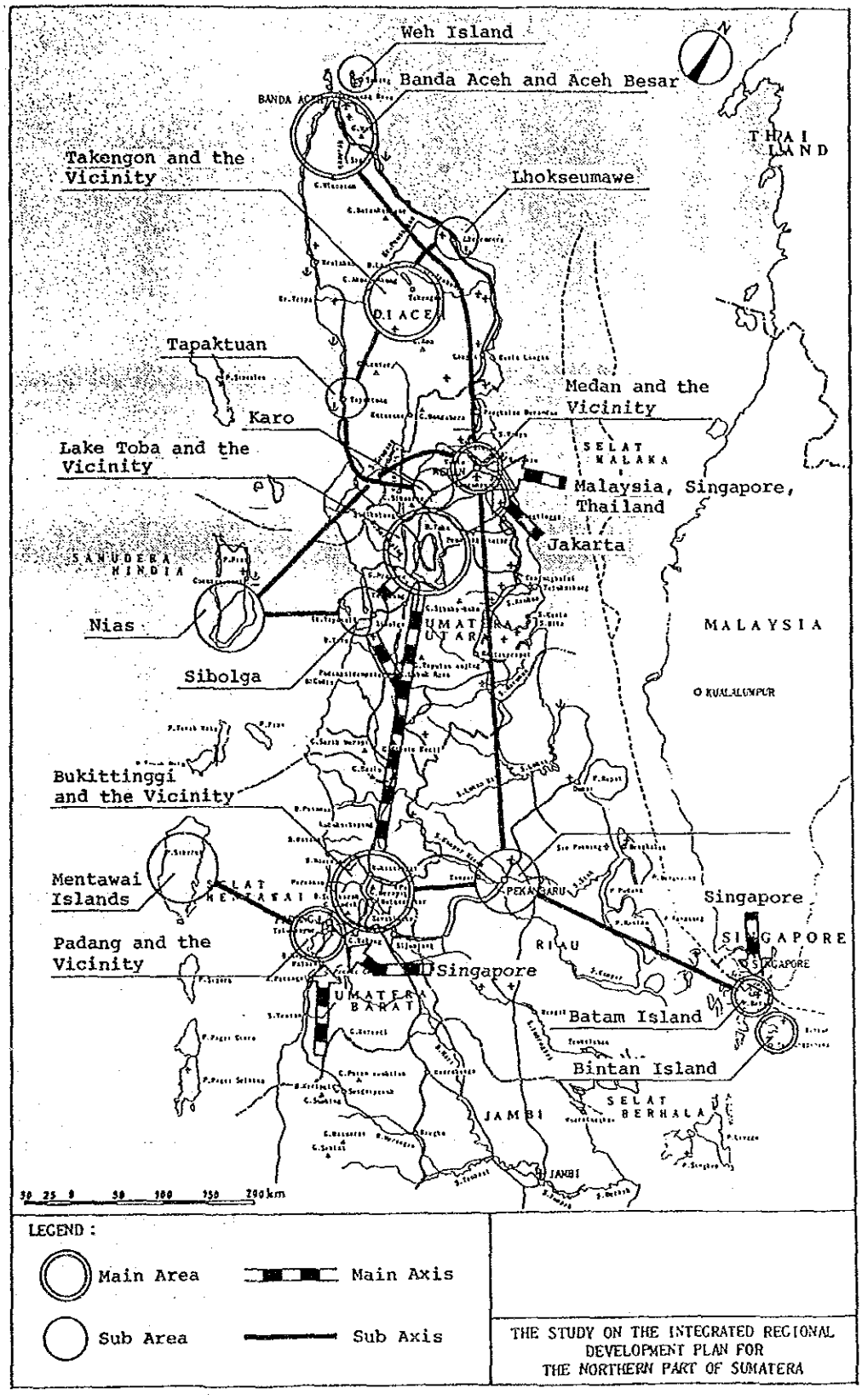
56. Booming Tourism

While the number of foreign tourists in Indonesia had been rapidly growing from 600,000 in 1982 to 1,060,000 in 1987, or 1.8 times larger during the last 5 years, this number is only about one third of the visitors to other ASEAN countries such as Singapore, Thailand and Malaysia. Within Indonesia, two major tourist spots are Bali and Java, followed by two outer islands, namely Sumatra (Lake Toba and Riau) and Sulawesi. The government target was to reach 1.2 million international arrivals per year by the end of Repelita IV (1984/85 - 88/89) with foreign exchange revenue of US$1.1 billion, both of which have been achieved. This revenue roughly equals to export earning from rubber, the second largest non- oil/gas export item next to plywood in the same year. On the other hand, the Government adopted a new policy to stimulate domestic tourism, encouraging a sense of national unity among Indonesia's various ethnic groups. Although reliable data are not available, it is believed that the number of domestic tourists has gradually increased in line with the international tourists. The Director General of Tourism pointed out the following factors to support developing domestic tourism : political stability, economic growth and additional income, improved education and knowledge, better quality of infrastructure and tourism accommodation.

57. Tourism Development Strategy

Based on the inventory and detailed analysis of a large number of tourism spots in the Region, the Team identified the following 8 areas as main tourism spots (or grade A) having at least two high potential tourism objects : (i) Banda Aceh and Aceh Besar; (ii) Takengon and the vicinity; (iii) Medan and the vicinity; (iv) Lake Toba and the vicinity; (v) Padang and the vicinity; (vi) Bukittinggi and the vicinity; (vii) Batam island, and (viii) Bintan and other islands. Presently, there is no single place in the Region which can attract as many tourists as Bali. Therefore, it may be a key to the tourism promotion in the Region to develop international, interregional and interprovincial travel routes and package tour programs. For instance, they are; (i) Bali-Java-N.Sumatra; (ii) Java-N.Sumatra-Java; (iii) Bali-N.Sumatra-Bali;and (iv) Singapore-N.Sumatra-Penang. Diagram 23 summarizes the tourism network prospect in 2008. In addition, there are many things to promote tourism, such as building infrastructure, inviting private tourism industries, developing human resources in the tourism industry and studying tourism routes. It takes long time and much money. Therefore, the Team suggests the following as tourism development strategy. First, improvement in the service quality; this should be supported by the government's investment in tourism-related minimum infrastructure including roads. Then, with more tourists visiting the Region, private investors may well be attracted to make investments in tourism facilities such as hotels and restaurants. As a result, more tourists will come, and more infrastructure can be developed subsequently.

Diagram 23. Tourism Network System(2008)



58. Urban and Rural Balance

Indonesia has a reasonably balanced distribution of cities and rural areas. Primacy is not a significant problem in Indonesia compared to other developing countries, even though Jakarta's growth rate is the fastest among metropolitan areas. In the Region the ratio of urban population was 20% in 1980, slightly less than the national figure (22%). There appears little need for massive adjustments to recent trends, but advanced caution may be desirable to avoid unplanned city congestion which occurred in Java and other ASEAN countries. The total population in the Region will increase from 20 million in 1988 to 30 million in 2008. The urban population in the Region will also grow from 4.9 million to 10 million, respectively. This indicates that an average annual growth rate is nearly 3.7%, far higher than the average growth rate of total population. In terms of absolute value, however, the rural population growth (5.3 million) is still larger than urban growth (5.1 million). The rural area must also respond to this rather large population growth properly.

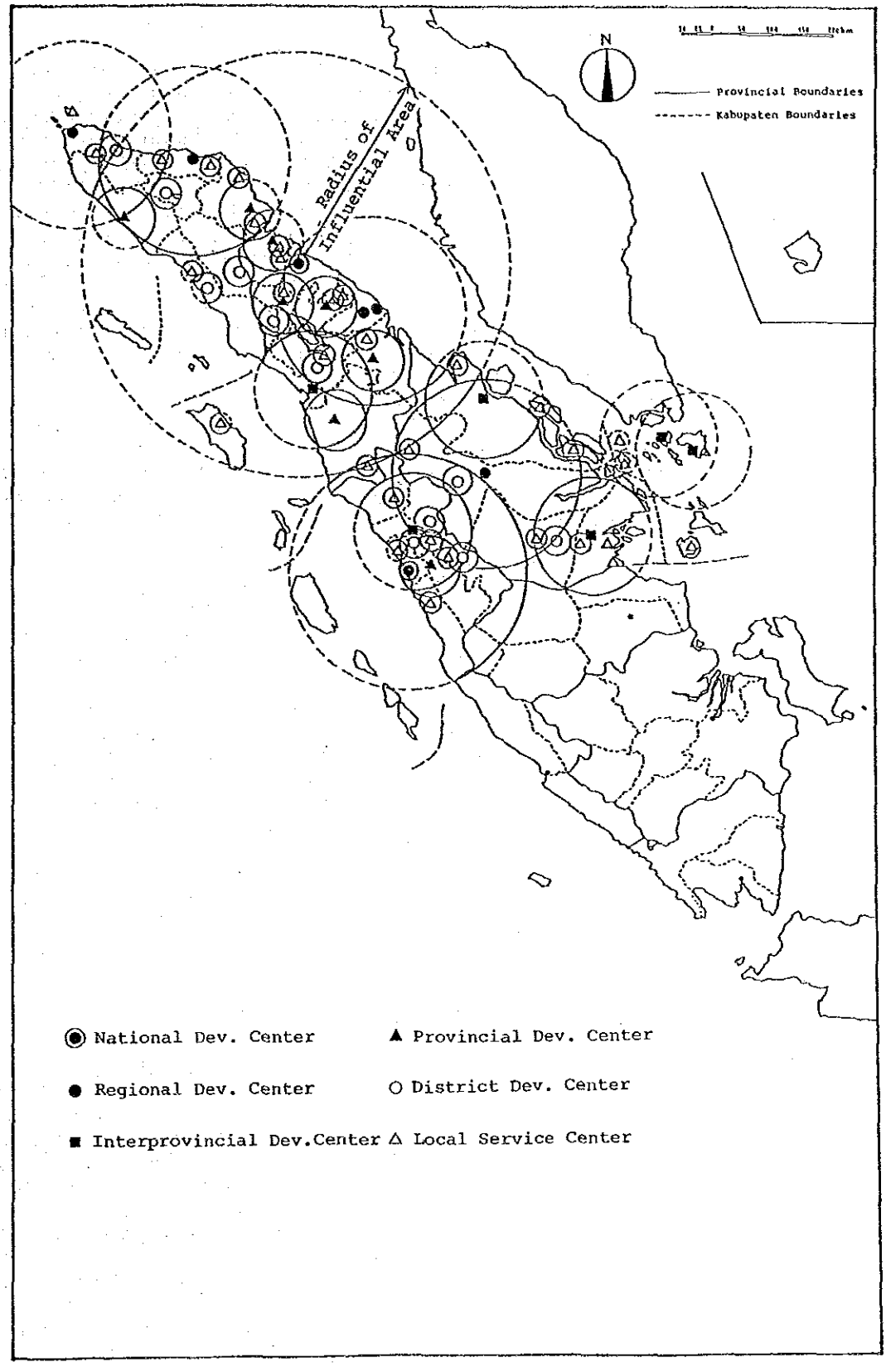
59. Urban and Rural Development Strategy

"Policies for Urban Development" presented by the coordination team for urban development are functioning as the basic planning guidelines in Indonesia, which should also be taken into consideration in this Study. They gave considerable authorities to provincial and local government in coordinating, planning, programming, identifying and execution of urban development projects under the "Integrated Urban Infrastructure Development Programming (IUIDP/P3KT)" system. The implementation of urban development under IUIDP is going smoothly in close coordination with different donor agencies, such as IBRD and ADB. In the last decade, several integrated rural development programs called PDP (Provincial Development Program) were implemented in the Region, particularly in Aceh and W.Sumatra. The PDP is one of area development strategies which was successful in the underserved, poor and isolated rural areas. Modified PDP approach suggested by the Team will function as an important development booster to the key hinterland development areas in the Region. Secondary cities urban development including drainage, solid waste, road and water supply will receive high priority, while PDP type of rural development should be encouraged with the establishment of rural technology extension program. Diagram 24 shows urban influential areas in the Region.

60. Employment Prospects

A rapidly increasing labor force in the Region during the Repelita V period accounting more than one million should be absorbed mainly within rural areas which hold more than 75% of the total population. The Government has introduced a variety of policy measures to cope with the employment problems in rural areas directly or indirectly through the development of small-scale, traditional and informal enterprises as well as cooperatives. These policy measures include: (i) credit schemes; (ii) agricultural programs; (iii) village assistance program; (iv) rural industries; (v) projects under presidential instruction (INPRES); (vi) volunteer services (BUTSI); and (vii) vocational training.

Diagram 24. Urban Influential Areas



IV. SELECTION OF PRIORITY PROJECTS

61. Project Identification

There are two typical ways of identifying projects in regional planning. One is to identify such projects as make up part of a national network or program. (Microwave system construction or agricultural extension centers, for example.) These projects are "top-down" by nature and their formulation is governed by sectoral priority and national consistency. The other way of identification is to heed local needs. (Feeder roads or small fishing ports, for example.) Projects identified this way are "bottom-up" (at least in their orientation) and attentive more to local specifics than to the overall structure. It is ideal if "top-down" projects fulfill local needs without conflict and "bottom-up" projects beautifully fit into the national framework. And this is exactly what regional planning aims at. This, however, is not easy to occur in reality. One motivation behind adopting the IDEP approach is to overcome the above difficulty. To avoid too strict sectoral priority on the one hand and too inefficient project proliferation on the other, the IDEP approach uses a two-way process of project identification. As explained earlier, 11 sites are first selected as high-priority areas on various strategic accounts. After a close study of local conditions, projects are designed which will facilitate the area's efficient development, while interacting with each other (IDEP projects). Separate from this procedure, projects necessary from the sectoral viewpoints are also identified throughout the Region (sectoral projects). The project ideas basically come from four sources:(i) study team; (ii) central government ministries and agencies; (iii) local government agencies; and (iv) donor agencies.

62. Selection Criteria

Criteria with relative weight used for setting priority among projects are: (i) how much benefit can be expected? (40%); (ii) how efficiently can the benefit be gained? (20%);(iii) how equitably can the benefit be distributed?(10%); and (iv) how difficult/urgent is it to implement the project?(30%). The scoring range between the highest and the lowest point is then divided evenly into three. The projects whose score ranks among the top third are labeled S (= short range), among the middle third, M (= middle range), and among the lowest, L (=long range). Those projects which are under implementation or have already been committed for implementation are excluded from these lists. The numbers of the projects are: 250(S), 149(M) and 31(L), totalling up to 430, as shown in Diagram 25.

63. Qualification of Selected Projects

Those projects selected should not be considered to bind any of the authorities in both Indonesia and Japanese Governments. Following qualifications should be strictly observed before any of those projects can be proposed for actual implementation. (i) The Team dose not claim that it is exhaustive or that projects not listed there be dismissed. Rather, it would be justifiable and appropriate to treat the List as tentative, something to be reviewed and renewed continually as the situation tends to be diverted from the predicted course. (ii) The Team does not imply by the term high priority that their feasibility is guaranteed. They should also be subjected to a scrutiny before implementation, and in that sense they are no superior to other S-ranked priority projects. (iii) As explained earlier in para. 61 above, there basically is no distinction between IDEP projects and sectoral projects. They were formulated on the same ground and their status is the same insofar as the Long List and priority setting are concerned.

Diagram 25. Classification of Priority Projects

	Project Total (A)	S Total	S High[1] priority (B)		S GFS[2]	M	L	IDEP[1] Related (C)		B/A (%)	C/A (%)
I. Intersectoral (excluding IDEP)	1	1	1	(9)	1	0	0	1	(9)	100	100
II. Sectoral	429	249	131	(173)	61	149	31	290	(168)	30	68
A. Agriculture and Fishery	63	41	25	(30)	20	20	2	57	(30)	40	90
B. Water Resources	72	35	20	(19)	4	37	0	33	(18)	28	46
C. Mining	8	6	5	(5)	3	2	0	7	(4)	63	88
D. Industry	79	57	14	(11)	3	22	0	41	(11)	18	52
E. Energy/Power	34	26	15	(30)	4	8	0	25	(30)	45	74
F. Transportation	68	40	25	(34)	15	19	9	48	(33)	37	71
G. Telecommunication	49	19	12	(19)	5	17	13	41	(19)	24	84
H. Forestry/ Environment	14	9	7	(8)	4	2	3	11	(7)	50	79
I. Tourism	12	6	4	(4)	2	5	1	7	(3)	33	58
J. Water Supply	4	2	1	(4)	0	2	0	2	(4)	25	50
K. Urban Development	13	4	2	(8)	0	7	2	9	(8)	15	69
L. Rural Development	13	4	1	(1)	1	8	1	9	(1)	8	69
I+II. GRAND TOTAL	430	250	132	(182)	62	149	31	291	(177)	30	68

Note: 1) In parentheses are numbers which allow double counting of the same project in multiple IDEPs.
2) A *GFS* (Guideline for Study) has been drafted for those high priority projects which require some guideline for study as the next action.

S-ranked Projects Outside 11 IDEPs

Sector	Aceh		N. Sumatra		W. Sumatra		Riau		Region	
A. Agriculture and Fishery	1	(0.7)	-		-		-		1	(0.7)
B. Water Resources	2	(37.5)	3	(44.5)	1	(2.5)	-		6	(84.5)
C. Mining	-		1	(6.0)	-		-		1	(6.0)
D. Industry	3	(7.5)	4	(12.5)	3	(7.5)	4	(57.5)	14	(85.0)
E. Energy/Power	1	(17.5)	-		-		2	(300.0)	3	(317.5)
F. Transportation	2	(77.0)	-		-		4	(96.5)	6	(173.5)
G. Telecommunication	1	(57.0)	-		1	(2.4)	2	(123.2)	4	(182.6)
H. Forestry/Environment	-		1	(11.0)	-		-		1	(11.0)
I. Tourism	1	(4.5)	1	(4.5)	1	(4.5)	1	(4.5)	4	(18.0)
K. Urban Development	1	(25.0)	-		-		-		1	(25.0)
L. Rural Development	1	(50.0)	-		-		-		1	(50.0)
Total	13	(276.7)	10	(78.5)	6	(16.9)	13	(581.7)	42	(953.8)

Note: 1) In parentheses are public investment in US$ million.

Diagram 26. Northern Aceh IDEP

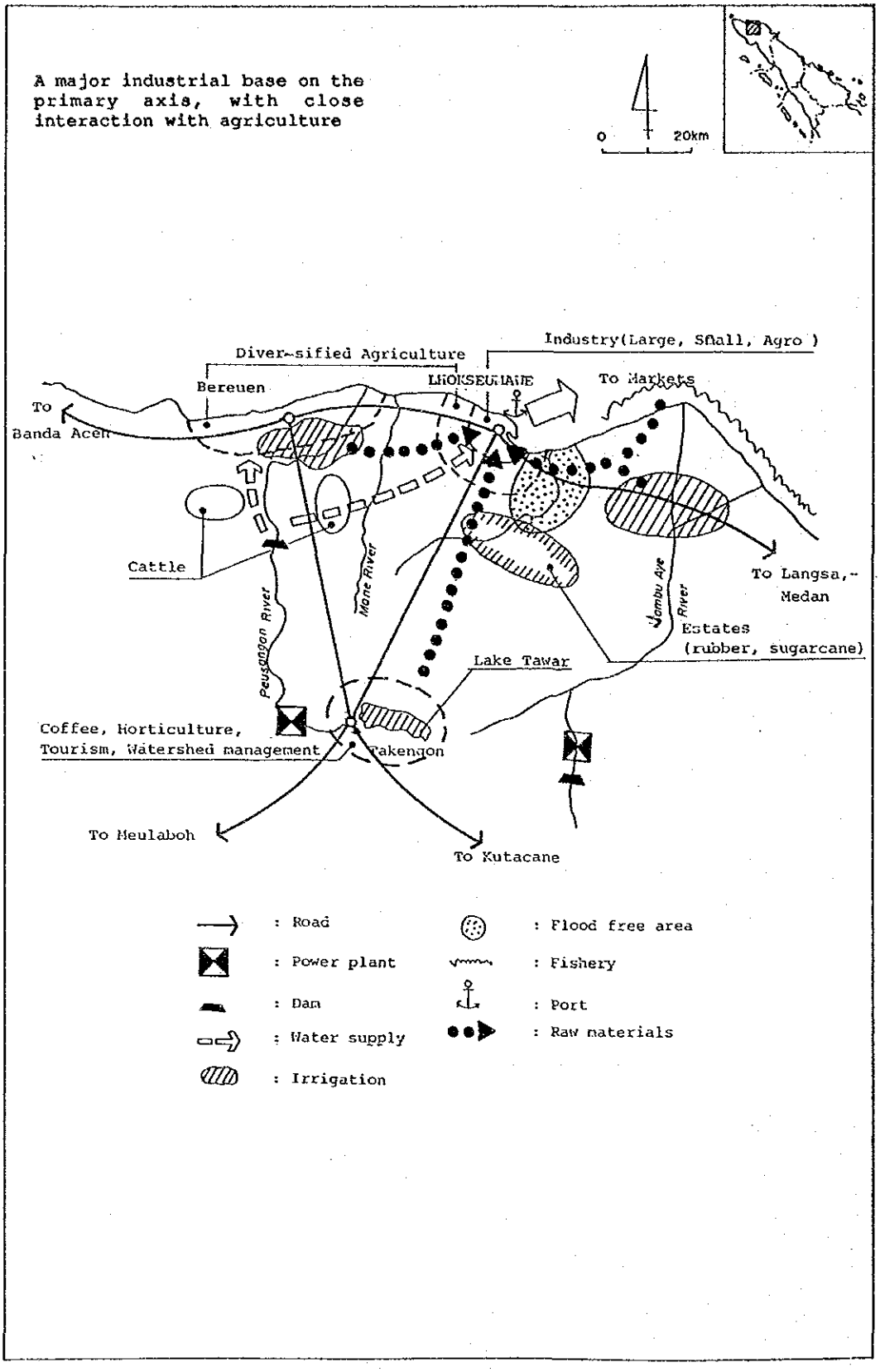


Diagram 27. Northern Aceh IDEP Project List

P-1	Northern Aceh															
																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 Agr. Mechanization			--	++	++	++	++							
A- 5	Study of Brackish Water Aquaculture Sites				--	-									
A- 6	Wetland Food Crop Intensif. and Diversif.	-	++	++											
A- 8	Higher-Altitude Horticulture Development		-	++	++	++	++	+					0		1.6
A- 9	Animal Nutrition and Marketing Improvement		--	++	++	++							0	0	7.5
A-12	*Smallholder Coffee Development*							-+	++	++	++				
A-15	Brackish Water Aquaculture Intensification	++	++	++			++	++	++	++	++		0		10.0
A-17	Lake Fishery Developement				--	--	++	++	++	++					
D- 4	Dev. of Marketable Handicraft Products		-	+	++	+							0	0*	0.4
D-15	Plastic Technology Service Center						--	++	++						
D-26	Agro-Industries		--	++	++	++							0	0*	
D-28	Fishery/Aquaculture-Related Industries			--	++	++	++								
D-29	Livestock-Related Industries			--	++	++	++								
D-31	Craft Industries			--	++	++	++								
D-32	Plastic Products Industries						--	++	++	++					
D-33	Other Consumer Goods Industries			--	++	++	++								
D-34	Aromatic Center	--	-+	++	++	+							0		
D-35	Polimer Production Industries				-	++	++	++					0		
D-36	Other Intermediate Goods Industries				--	++	++								
D-37	Light Engineering Industries		-	++	++	++	++								
H- 2	Integrated Foresty Planning						--	--							
H- 6	Re/Afforestation			--	++	++	++						0		0.5
I- 3	Lake Tawar and the Vicinity Tourism Dev.		-	--	++	++	++								
	II. Infrastructural Sectors														
B- 4	Urban Water Supply and Imp. (Lhokseumawe)	-	++	++	++	++							0		2.0
B- 5	Peusangan Basin Overall Development		--	--									0		2.6
B- 6	Kr. Pase Urgent Flood Control			--	++	++	++								
B-35	Kr. Tuan Irrigation				--	++	++	++	++	++					
B-36	Kr. Pendrah Irrigation				--	++	++	++	++	++	++				
B-37	Kr. Peudada Irrigation					--	--	-+	++	++	++				
D- 7	Industrial Estate/Area (Lhokseumawe)		--	++	+								0	0*	5.0
E- 2	*Rural Electrification*	++	++	++	++	++	++	++	++	++	++	++++++++++++	0	0*	5.0
E- 5	Peusangan-1 & 2 Hydropower (64MW)			+	++	++	++	++	++	++	+				
E- 6	Peusangan-4 Hydropower (31MW)		--	-+	++	++	++	++	++	++			0		15.0
E- 8	Jambu-Aye Hydropower Schemes					--	-	+	++	++	++				
E- 9	Gas-fired Thermal Plant				--		++	++	++						
E-10	High Voltage Transmission Line (150kV)			--	--		++	++	++	++	++	++++++++++++			
F- 1	Arterial Road Upgrading		--	-	++	++	++						0	0*	50.0
F- 2	Road Disaster Prevention		--	-	++	++	++						0	0*	30.0
F- 4	*Bridge Replacement Program*		--	++	++	++							0	0*	19.0
F- 8	Takengon-Sidikalang Road Betterment						++	++	++	++					
F- 9	Lhokseumawe-Takengon East-West Road						++	++							
F- 9	Takengon-Meulaboh East-West Road					--	--	++	++	++	++				
F-13	Langsa-Lhokseumawe Railway Reconstruction									--	--				
F-16	Lhokseumawe Port Expansion				++	++							0		3.6
G- 1	Medan-Banda Aceh Digital Microwave System											--+++++			
G- 6	Kabupaten Local Telephone Network Expansion						++	++	++						
G- 8	Subscriber Radio System (Phase II)											++++++++			
G-10	100 Small Earth Stations Provision							++	++	++					
G-12	Coin Telephone Sets Provision			++	++	++	++	++					0		0.6
G-14	Telephone Outside Plant Maintenance Center						++	++				++++			
J- 1	Urban and Rural Water Supply Program I	-	++	++	++	++	++								
K- 5	Kampung Improvement Support Program	-	-+	++	+										
K- 6	Urban Road Improvement Program		--	++	++	++									
	III. Others														
P-12	Production and Marketing Study		--										0	0*	1.0
														Total	153.8

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.

Diagram 28. West Aceh IDEP

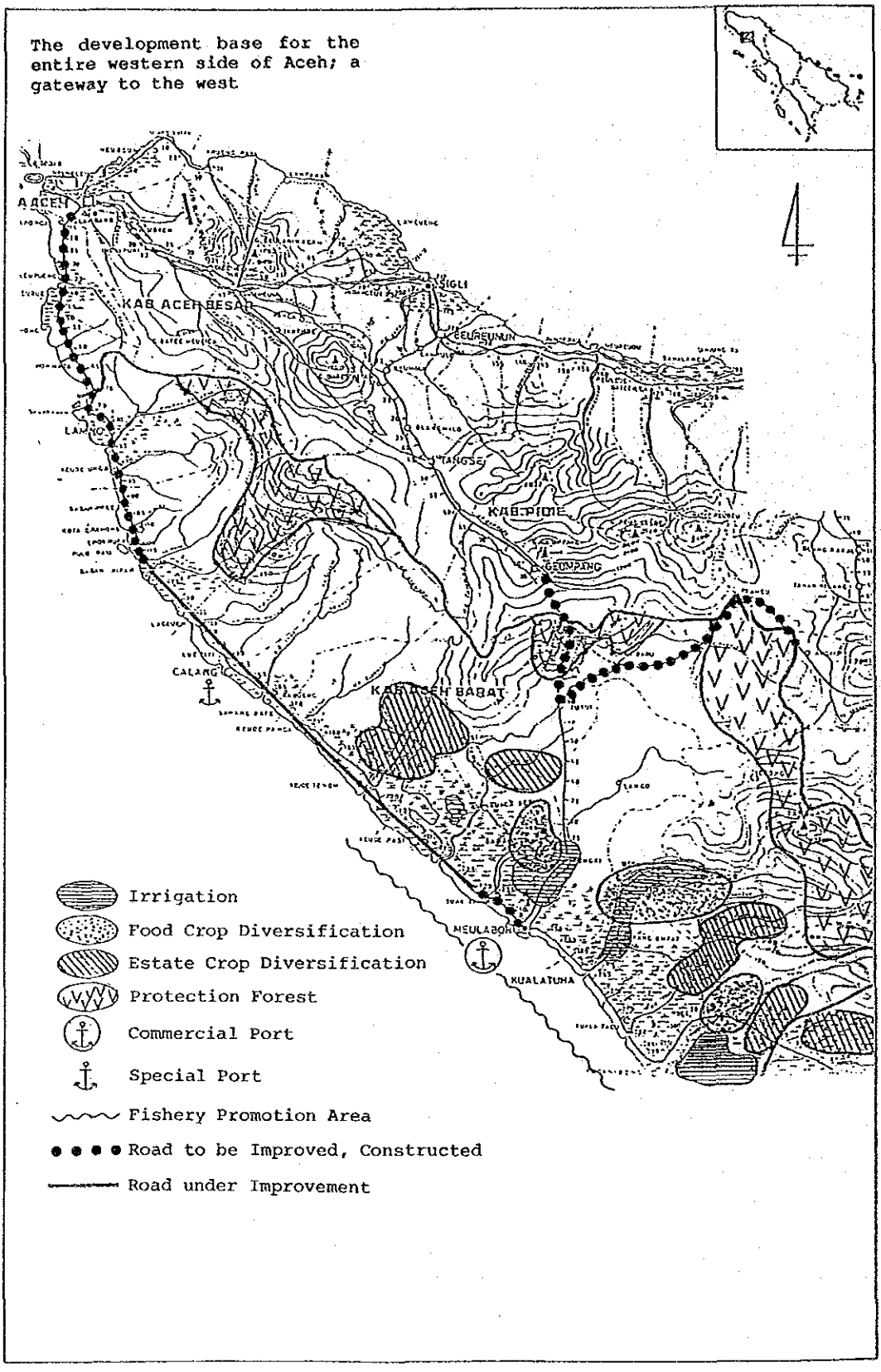


Diagram 29. West Aceh IDEP Project List

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	Seunagan 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-Takengon-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.

Diagram 30. Metropolitan Medan IDEP