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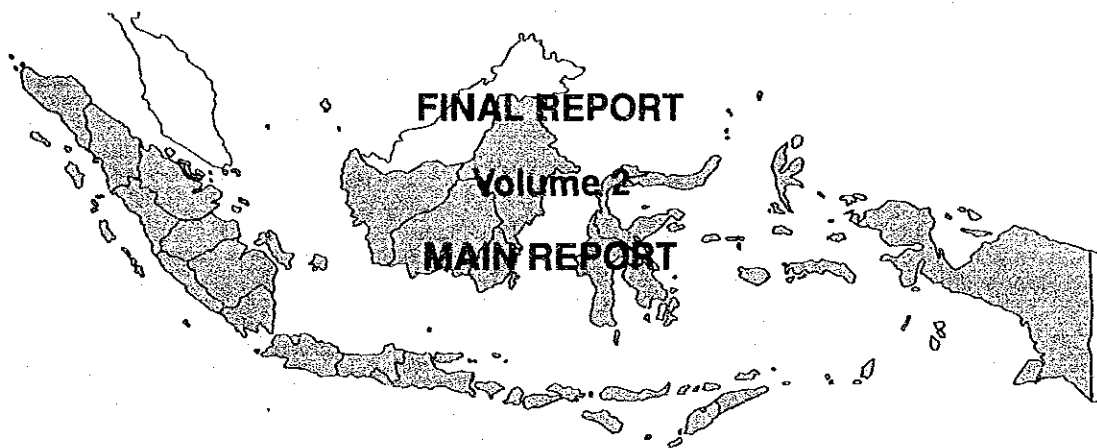
JAPAN INTERNATIONAL COOPERATION AGENCY
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BUREAU OF WATER RESOURCES AND IRRIGATION
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MINISTRY OF PUBLIC WORKS

**THE STUDY
FOR
FORMULATION OF IRRIGATION DEVELOPMENT PROGRAM
IN
THE REPUBLIC OF INDONESIA**



THE STUDY FOR
FORMULATION OF IRRIGATION DEVELOPMENT PROGRAM
IN THE REPUBLIC OF INDONESIA

FINAL REPORT
Volume 2
MAIN REPORT

November 1993

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PREFACE

In response to a request from the Government of the Republic of Indonesia, the Government of Japan decided to conduct a Study for Formulation of Irrigation Development Program and entrusted the study to the Japan International Cooperation Agency (JICA).

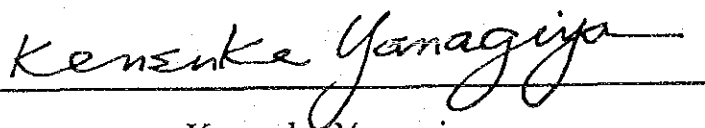
JICA sent to the Indonesia a study team headed by Dr. Yasuhiko KUNIHIRO, Nippon Koei Co., Ltd., four times between April 1992 and August 1993.

The team held discussions with the officials concerned of the Government of the Indonesia, and conducted field surveys at the study area. 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 the Republic of Indonesia for their close cooperation extended to the team.

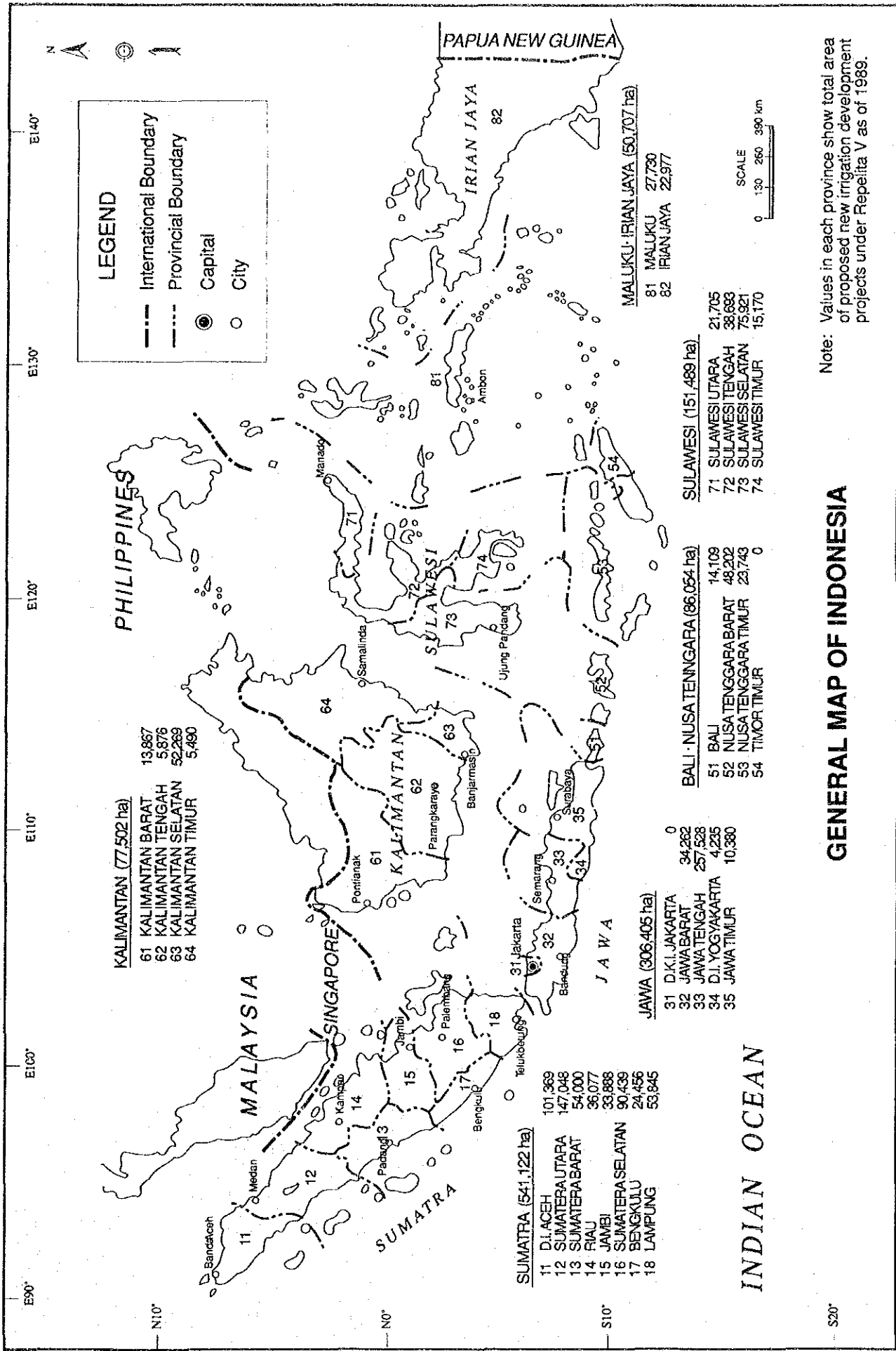
November, 1993



Kensuke Yanagiya

President

Japan International Cooperation Agency



GENERAL MAP OF INDONESIA

**THE STUDY
FOR
FORMULATION OF IRRIGATION DEVELOPMENT PROGRAM
IN
THE REPUBLIC OF INDONESIA
FINAL REPORT**

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Abbreviations

AMDAL	Environmental Impact Assessment
APBN	Anggaran Pendapatan dan Belanja Negara
APBD	Anggaran Pendapatan dan Belanja Daerah
BAPPEDA	Badan Perencanaan Pembangunan Daerah - Provincial Development and Planning Agency
BAPPENAS	Badan Perencanaan Pembangunan Nasional - National Development and Planning Agency
BIMAS	Mass guideline for agricultural development
BPP	Bina Program Pengairan - Planning Division of Water Resources
BULOG	Badan Urusan Logistik - Agency for National Logistics Administration
CBS (BPS)	Central Bureau of Statistics (Biro Pusat Statistik)
DGWRD	Directorate General of Water Resources Development in MPW
DOI	Directorate of Irrigation
DPU	Provincial Public Works
EOM	Efficient Operation and Maintenance
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographical Information System
GOI	Government of Indonesia
IBRD	International Bank for Reconstruction and Development
JICA	Japan International Cooperation Agency
Kanwil	District Office of a Line Agency under Minister
KUD	Village cooperative
MOA	Ministry of Agriculture
MOF	Ministry of Forestry
MOH	Ministry of Home Affairs
MPW	Ministry of Public Works
OECF	Overseas Economic Cooperation Fund, Japan
P3A	Water Users Association
Palawija	Secondary food crops (grown mainly in dry season)
PBME	Project Benefit Monitoring and Evaluation
PIK	Proyek Irigasi Kecil (Handing over small scheme)
PIR	Perkebunan Inti Rakyat (Nuclear Estate Schemes)
PJPT I	Pembangunan Jangka Panjang Tahap I
PJPT II	Pembangunan Jangka Panjang Tahap II
p.m.	pre memoria
PRAS	Provincial Agricultural Services
PRIS	Provincial Irrigation Services
PU	Ministry of Public Works
Repelita	Rencana Pembangunan Lima Tahun - Five-Year Development Plan
RePPPProt	Regional Physical Planning Program for Transmigration
SUSENAS	Survei Sosial Ekonomi Nasional (National Socio-economic Survey)
USAID	United States Agency for International Development

Part I

INTRODUCTION

Chapter 1

PART I. INTRODUCTION

1. INTRODUCTION

1.1 General

This Final Report was prepared in accordance with the scope of work on the Study for Formulation of Irrigation Development Program in the Republic of Indonesia (the study) agreed upon between the Directorate General of Water Resources Development (DGWRD) of the Ministry of Public Works (MPW) and Japan International Cooperation Agency (JICA) on November 24, 1991.

The report describes all the results of the Study conducted during the period from April 1992 to August 1993.

1.2 Background of the Study

Sustenance of self-sufficiency in rice production is one of the most important issues in the agricultural sector under the Fifth Five-Year National Development Plan (Repelita V) which commenced in April 1989. Although Indonesia has been self-sufficient in rice since 1984, continuous efforts to increase rice production are a prerequisite to meet the increasing demand. Irrigation development is expected to play a major role to overcome this issue.

Increase of rice production to attain and sustain self-sufficiency has mainly relied on irrigation development especially in Jawa, Sumatera and Sulawesi, as well as on intensification programs such as supra-insus. However, further rice production increase will not be expected much from these programs. In Jawa, land has almost been fully utilized and the level of paddy farming technology has already been high, which implies little possibility of big production increase. On the contrary, recent urbanization and industrialization around large cities have resulted in the decrease of productive paddy fields including irrigated ones. In the present Repelita, development effort is going towards areas outside of Jawa.

The irrigation development program in Repelita V consists of three components: (1) rehabilitation and maintenance, (2) new irrigation development, and (3) swamp development. While each program has a target area, and while concrete plan has recently been established, those targets or plans have not been formulated based on the strategy how to maintain self-sufficiency in rice.

The irrigation development should be programmed, in line with the national development policy and food production program, to meet the increase in rice demand. To ensure reliability such a program should be soundly formulated, based on basic data such as land and water potential and human resources. Also since it takes long time to realize irrigation development from the identification stage, the program should be formulated in a long term basis.

Recognizing the need to formulate a irrigation development program for the sustenance of self-sufficiency in rice, the Government of Indonesia (GOI) requested the Government of Japan (GOJ) for technical cooperation. In response to this request, a preliminary study team consisting of four experts was dispatched by the GOJ for the period from March 16 to May 28, 1989 to prepare a terms of reference for a detailed study. In the preliminary study, emphasis was put on new irrigation development program.

Based on the results of the preliminary study, the GOI again requested the GOJ for technical cooperation to formulate a long term irrigation development program. In response, a preparatory study team was dispatched by the GOJ for twelve days from November 12 to November 23, 1991 to clarify the background and specific contents of the request and to work out the scope of work for the study requested.

1.3 Objectives of the Study and Study Area

The objectives of the study as agreed upon between DGWRD and JICA are the following:

- (1) To formulate an irrigation development program, in a long term range, which provides the current and future Repelita with rationale and guideline of irrigation development plans having regional priority, in line with overall food production increase program, thus contributing to the sustenance of self-sufficiency in rice, and
- (2) To carry out technology transfer to the Indonesian counterpart personnel in the course of the Study.

The study area covers the whole Indonesia with an area of 1.92 million square kilometers.

1.4 Study Progress

In accordance with the agreed scope of work, JICA sent a study team consisting of eight Japanese experts for this specific study, to prepare an Inception Report for thirty-nine days from April 13 to May 21, 1992. The study team first submitted a Plan of Operation of the study, which explains the general idea on work items, methodology and schedule to Indonesian side, and several meetings were held between Indonesian side and the study team to get general agreement on the Plan of Operation. Then the study team prepared a concrete work plan of the study, through discussion with Indonesian officials from various agencies and also through data collection. Besides, inventory format to be used for the inventory survey which is to be carried out in the subsequent stage was prepared. The results of the Study during the period was compiled into the Inception Report and the report was submitted to DGWRD on May 13, 1992. After the explanation of the report and getting agreement, the study team once went back to Japan on May 21, 1992. During the study period, DGWRD established a Technical Study Committee (TSC) and a Policy Meeting to support the study. Besides, the Agriculture and Water Resources Bureau of BAPPENAS also got much interest in and offered cooperation to the study, which had resulted in the establishment of consultative committee composed of BAPPENAS, MPW, Ministry of Agriculture (MOA) and Central Bureau of Statistics (CBS).

The main study started on June 15, 1992. Before the commencement of the main study, some modification on manning schedule was made, which was followed also by the modification of work flow. In the course of the main study, the study team prepared a Progress Report (I) and submitted to DGWRD on August 19, 1992. The study team then explained the contents of the Progress Report (I) to Technical Study Committee members and to Policy Meeting members in DGWRD and Consultative Meeting members under the coordination of BAPPENAS. The Progress Report (I) was generally accepted with several comments.

After the submission of the Progress Report (I), wide range of study has been carried out by full members of the study team. The study included rice demand study, rice production potential study, irrigation development study in which inventory survey was included, regional development study, water resources study, land potential study, environmental study, etc. New inputs have been provided to the study team through consultation with concerned Ministries and/or agencies.

A series of workshop has been held for the purpose of transfer of knowledge at the end of the assignment of experts. These are:

Rice Demand Projection	:	October 1, 1992	by Mr.T.Matsuo
Rice Production Potential	:	October 10, 1992	by Dr.G.Wada
Land Potential	:	November 24, 1992	by Mr.M.Nishiya
Water Resources	:	November 24, 1992	by Mr.C.Kubota

The above study results were collectively analyzed, and future rice balance between supply and demand was estimated to be deficit unless efforts on new irrigation development were made, from which the necessity of further irrigation development was justified. Such study results were compiled as a draft version of Interim Report, which was discussed between the study team and the Technical Study Committee members of DGWRD on November 29, 1992. Considering several comments raised by TSC members, the study team prepared a final version of the Interim Report during the two-weeks home work assignments in Japan. The Interim Report was submitted to DGWRD on December 19, 1992. The contents of the report was discussed at the Policy Meeting on December 21, 1992, which was basically accepted with several comments/suggestions. The study team also explained the Interim Report to BAPPENAS on December 22, 1992, and BAPPENAS agreed to the interim results.

The study was continued in order to formulate irrigation development program for the purpose of rice production increase to meet the increasing demand. The study in this stage includes clarification of irrigation development objectives and strategies, preparation of irrigation development framework and scenarios, and formulation of irrigation development program consisting of development scale, order, region, and costs. A management system of irrigation development program was also prepared. During this study period, the study team members visited four selected provinces (Sumatera Utara, Sumatera Barat, Sulawesi Tengah and Sulawesi Selatan) and made field survey to inspect the existing irrigation area and to know the actual condition of the potential area for extension and/or land development. These study results were compiled as the Progress Report (II), a draft of which was submitted to DGWRD on March 15, 1993. The draft version of the Progress Report (II) was discussed in the joint meeting of Technical Study Committee and Policy meeting, and the report was basically accepted. After having explained the report to the Agriculture and Water Resources Bureau of BAPPENAS on March 17, the study team went back to Japan on March 19, 1993. The final version of Progress Report (II) was prepared in Japan, and it was sent to DGWRD on March 26, 1993.

The study team was dispatched to Indonesia again on June 1, 1993, to start the final stage study. Aside from the preparation of a draft final report as the main objective of this study stage, several studies including preparation of inventory of village irrigation schemes, re-assessment of irrigation development projects which has been implemented during Repelita V, and re-examination of management system of irrigation development program were also made. As this study period overlapped with the preparation period of Repelita VI and PJPT II, the study team, having close contact with staffs of DGWRD and BAPPENAS, cautiously made study so as not to have contradiction between the study output and development plan by the Indonesian Government, and extended transfer of knowledge through joint work with counterpart personnel.

However, just after the study teams' starting the final stage study in June, it was found that BAPPENAS had issued macro socio-economic framework for PJPT II in May 1993, in order to make future development plans to be formulated by relevant agencies consistent. The macro frame includes population projection, target economic growth, per capita GDP growth, estimated labor situation, education level, fertility rate, etc. The director of bureau of planning of DGWRD sent a formal letter to the study team on June 22, 1993 to ask to revise the study based on the BAPPENAS's socio-economic framework. In response to the request, the study team replaced the previous values with new ones, which affects rice demand projection, rice demand and supply balance study and the formulation of irrigation development program.

In addition to the above works, minor modification was made on the previous study results. Draft Final Report was prepared by compiling all the study results made in the previous study stages and new results in the final study stage which are; (i) inventory of village irrigation scheme, (ii) update of agricultural statistics, and (iii) recommendations. The Draft Final Report consisting of Executive Summary, Main Report and ten Annexes, was submitted to DGWRD on August 21, 1993, and it was explained to and discussed with TSC and Policy Meeting members of DGWRD on August 23, 1993, under the presence of the Japanese advisory committee team of the study. DGWRD generally agreed with the Draft Final Report.

Two-days seminar on the study was held in order to promote transfer of knowledge on August 24 and 25, 1993. Ten subjects were presented including special lecture on Operation, Maintenance and Management of Irrigation and Drainage systems in Japan by Mr.M.Ishikawa from the Ministry of Agriculture, Forestry and Fisheries. A text was prepared specially for the seminar. More than 100 attendants in total were participated in the seminar.

In the course of the final stage of the study, a lecture on computer database system of irrigation schemes was held by Mr.T. Igawa, using the results of inventory survey which was conducted as a part of the study.

It is noteworthy that according to the re-organization of BAPPENAS in March 1993 after the election of the President, Bureau of Agriculture and Water Resources was divided into the Bureau of Agriculture and Forestry and Bureau of Irrigation and Water Resources, the latter of which becomes the counterpart bureau in BAPPENAS to the Study.

The overall study flow and assignment schedule of the experts of the Study is presented on Figures 1.1 and 1.2, respectively.

1.5 Organization of the Report

(1) Report Composition

This report is the Master Plan Report of the Draft Final Report on the Study for Formulation of Irrigation Development Program in the Republic of Indonesia. Ten annexes are attached to this report. They are :

- Annex A : Rice Demand Projection
- Annex B : Agricultural Production Potential
- Annex C : Land Resources Assessment
- Annex D : Water Resources Assessment
- Annex E : Inventory Survey
- Annex F : Past Performance of Irrigation Development
- Annex G : Small Scale Irrigation
- Annex H : Environmental Consideration
- Annex I : Database and Its Management
- Annex J : Land Development

(2) Organization of the main report

This is the Master Plan Report, and is composed of the following three parts: Part I Introduction; Part II Justification of Irrigation Development; and Part III Formulation of Irrigation Development Program. The report is compiled to have logic as a whole, but each

part and/or each chapter is independently prepared so that one who may be interested in the specific theme can understand by reading only interesting chapter(s)/part(s).

Part I describes the background of the study, purposes of the study, progress of the study (Chapter 1), socio-economic situation of Indonesia, overview of PJPT II, province-wise regional development plan (Chapter 2) and land and water resources (Chapter 3), all of which give the basis of the Study.

Socio-economic situation is explained based mainly on the publication by CBS, which includes land use, economic growth and productivity, consumption expenditure, social infrastructure, national income and expenditure, etc. And provisional issues in future development stage are pointed out from agricultural and environmental points of view. The Second Long Term Development Plan (Pembangunan Jangka Panjang Tahap II; PJPT II) is overviewed based on the National Policy Guideline (Garis-garis Besar Haluan Negara; GBHN) and the macro socio-economic indicator issued by BAPPENAS. Besides, the regional development plan (draft) for Repelita VI, in which priority areas and sectors are presented by province, is explained.

Land and water resources were assessed as important factors for examining the possibility of irrigation development. Land resources are assessed based on the Regional Physical Planning Programme for Transmigration (RePPPProT) which have been completed by Ministry of Transmigration in cooperation with Overseas Development Administration (ODA) of the United Kingdom. Land suitability and land use data are evaluated to estimate the land potential for lowland agriculture development. While water resources for irrigation development is assessed based on the rainfall data and river discharge data by river basin accumulated by DGWRD. Taking into account the domestic, municipal and industrial water demand, river maintenance flow and water demand for livestock and fish pond, available water volume for irrigation is estimated. Integrated land potential with water potential, irrigation development potential is evaluated.

Part II describes the justification of irrigation development as a basis of the irrigation development program to be formulated in Part III, through rice demand projection (Chapter 4), paddy production potential (Chapter 5) and irrigation development performance (Chapter 6), and Justification of Irrigation Development (Chapter 7).

Rice demand projection is made by population projection and projection of per capita consumption of rice. Those projection is made by province and urban and rural fraction. All of basic data are cited from official figures issued by CBS and BAPPENAS. It is clarified through the study that per capita consumption of rice differs among provinces and that the

share of rice consumption expenditure in total household expenditure in segment of expenditure classes differs between urban and rural.

Paddy production potential is assessed through the analysis of factors contributing to the past paddy production increase based on the statistical data from CBS and MOA. As a result, it is clarified that irrigation has contributed to yield increase, paddy area increase and increase in cropping intensity all of which are conducive to paddy production increase. Paddy field is classified into several categories according to eco-type, and yield and cropping intensity is estimated in each category by province. Extension degree of high yielding varieties is evaluated in relation to irrigation development extent.

Irrigation development performance is evaluated through development area and investment cost from the First Five-Year Development Plan. Based on the results of the inventory survey on existing irrigation schemes made as a part of the Study, irrigated paddy field is classified into several types, and schemes in each type have further been classified into on-going schemes, proposed schemes and regular operation and maintenance (O&M) schemes. Not yet irrigated areas in the existing irrigation schemes are also presented to suggest the future development possibility. Besides, present situation of village irrigation schemes and progress of land development are examined based on the existing data. The effect of each irrigation development program on paddy production increase is estimated for the program formulation purpose. Time lag between irrigation facilities construction and full development of paddy production is also assessed.

In order to assess the necessity of new irrigation development, other factors affecting paddy production are considered in addition to the above study results. They are: (i) government policy on fertilizer subsidy, (ii) land conversion from paddy field to other purpose, (iii) conversion of sugarcane and tobacco area back into paddy field, (iv) autonomous increase of paddy yield resulting from the implementation of BIMAS program and from improvement of farming technique, (v) on-going irrigation development projects which are conducive to increase of paddy area and cropping intensity, etc. Taking all the factors into consideration, paddy production increase under without new irrigation development condition is projected to compare with projected paddy demand.

Part III describes the irrigation development objectives and strategies (Chapter 8), the development framework and scenarios (Chapter 9), target area of irrigation development, cost estimates (Chapter 10), management of irrigation development program (Chapter 11) and other recommendation (Chapter 12).

Irrigation development objectives are defined in line with the government development policy and agricultural development policy set for PJPT II described in GBHN. Realistic irrigation development strategy is presented so as to fulfill both the given condition of sustenance of self-sufficiency in rice and national development policy emphasizing eastern region development, considering resource potential and socio-economic condition, etc.

Irrigation development framework is set to meet the increasing demand for rice, and alternatives to achieve the target are analyzed. Based on the most recommendable alternative, development scenario up to the year 2020 is described taking regional characteristics into account.

Irrigation development program as materialization of the development strategy set the target development area to produce the required amount of paddy so as to meet the increased demand. Target development area is determined in each development type by province and by year, based on the target of regional self-sufficiency or regional development rate. Development costs are estimated by multiplying development area with unit cost in each development type.

An optimum management system of the irrigation development program is proposed by comparing alternatives in light with the procedure for the formulation of the program in which parameter assumptions in various fields are involved.

Several recommendations are presented to improve the planning procedure and methodology not only for DGWRD but also to other agency.

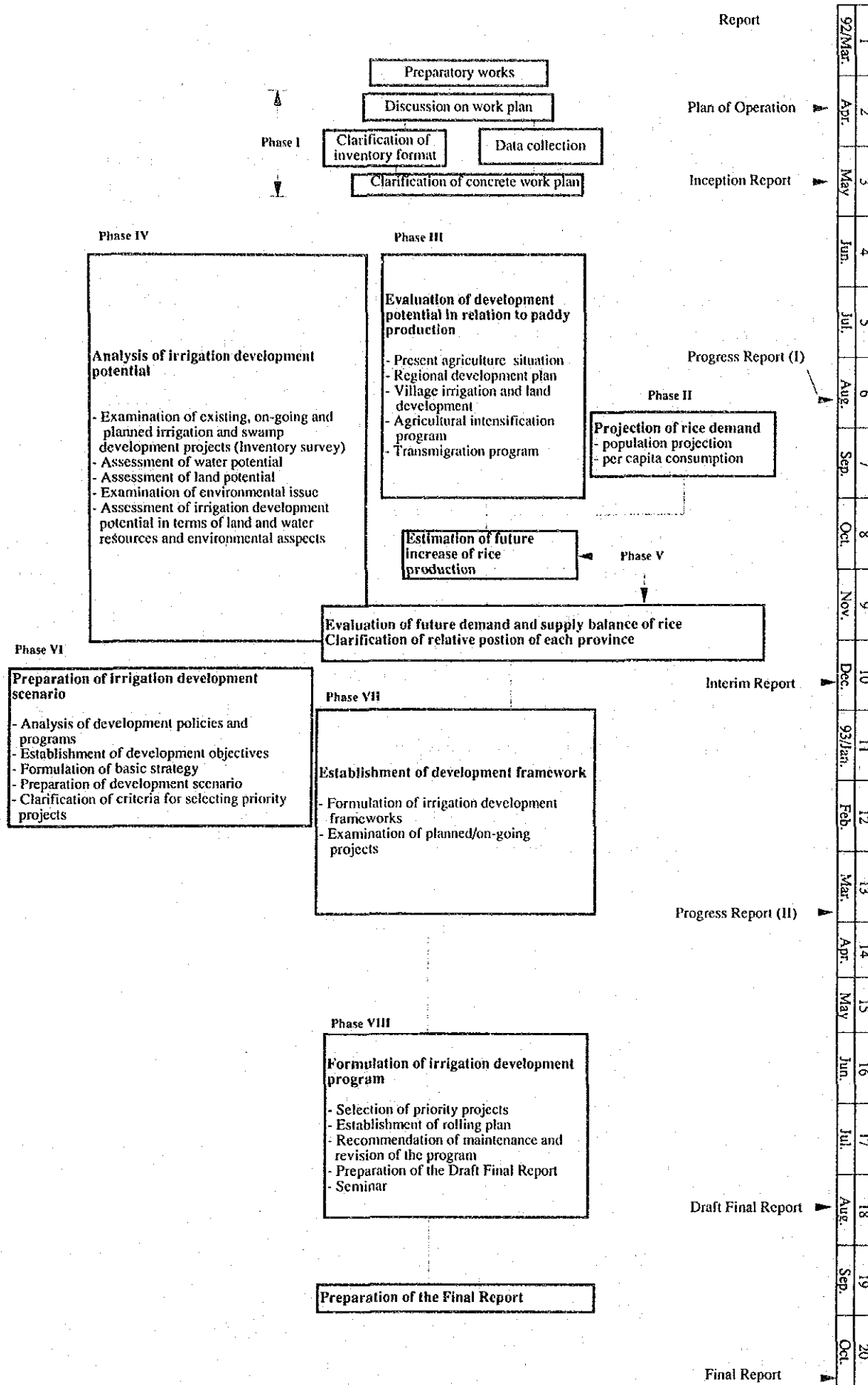


Figure 1.1 Study Work Flow

Expertise	Name	1992												1993								
		Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
Team Leader	Y. Kunihiro	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Development Planner/Land Use Planner	A. Kojima	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Agro-economist	T. Kimijima	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Agricultural Specialist	G. Wada	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Irrigation and Drainage Engineer	T. Nomoto	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
System Engineer	T. Igawa	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Statistics Specialist	Y. Hayashi	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Soil Scientist	M. Nishiya	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Meteorologist/Hydrologist	C. Kubota	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Environmentalist	T. Kitaguchi	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Marketing	T. Matsuo	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Assistant	T. Tamura	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Report		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲

Remarks: P/O; Plan of Operation IC/R; Inception Report P/R(I); Progress Report (I) IT/R; Interim Report
P/R(II); Progress Report (II) DF/R; Draft Final Report F/R; Final Report

■ Field
□ Home

Figure 1.2 Assignment Schedule of the Experts

Chapter 2

2. PRESENT SOCIO-ECONOMIC SITUATION AND OUTLINE OF THE FUTURE DEVELOPMENT PLAN

2.1 Present Socio-Economic Situation

2.1.1 Area, Population and Land Use

Indonesia, consisting of more than 13,000 islands, is the largest island country in the world with total area of 1.9 million km². The territorial extent is huge; some 5,000 km in east-west direction which is almost the same as that of the US., and 3,000 km in north-south direction. Thanks to the wide area extent and unique topography, Indonesia enjoys various climate with which agriculture could have various option. Important islands are Jawa, Sumatera, Kalimantan, Sulawesi, Bali, Lombok, Irian Jaya, etc. where human activities are seen.

Total population as of 1990 is some 179 million, with annual increase rate of about 1.98% since 1980. Jawa, occupying only 6.9% of total area, accounts for 60% of total population or 107.5 million, followed by Sumatera (20% of total population or 36.4 million). Thus, the distribution of population is not proportional to area of island. Jawa is most populated with density of 813 person/km² while New Guinea island (Irian Jaya) has only less than 4 person/km² (cf. 93 person/km² national average), which also induce imbalance of investment as well as development level. The urban population ratio to total population (urbanization rate) is 31% on an average, ranging from 100 % (Jakarta) to only 7.8% (Timor Timur). Province wise data on land area, population and urban population are as shown on Table 2.1 and summarized below:

Land Area, Population, Population Density and Urban Population by Island/Province

Island/Province	Land area (km ²)	Population (thousand)	Pop. density (person/km ²)	Urban pop. (thousand)	Urbanization rate (%)
Sumatera	473,481	36,420	77	9,291	25.5
Jawa	132,186	107,518	813	38,335	35.7
Bali, NT and Timtim	88,488	10,162	115	1,747	17.2
Kalimantan	539,460	9,103	17	2,507	27.5
Sulawesi	189,216	12,511	66	2,761	22.1
Maluku & Irian Jaya	496,486	3,480	7	748	21.5
Whole Indonesia	1,919,317	179,194	93	55,389	30.9

Source: Penduduk Indonesia, Hasil Sensus Penduduk 1990 and Statistik Indonesia 1991, CBS

Land use in Indonesia is characterized by the high rate of forest area. Some 70% of total area or 1.3 million km² are covered with forest (but not necessarily virgin forest). Less populated islands including Kalimantan and Irian Jaya contribute much to this. Lowland paddy field shares 4.4% of total land area or some 84,000 km², about 42% of which are developed in Jawa, followed by Sumatera (28%). Arable upland and estate areas shares 250,000 km² or 13% of total area, 41% of which are seen in Sumatera. Dryland or grassland and fallow land where attention should be paid from the viewpoint of environment shares 123,000 km² or 6% of total area. This area may be much related with shifting cultivation activities. Wide swamp area extends over the coastal area of Kalimantan, Sumatera and New Guinea islands, sharing 75,000 km² or less than 4% of total area. House compound area is mainly seen in populated area like Jawa, of which more than 10% are used for it. Province wise land use are as shown Table 2.2 and summarized below:

Share of Area in Each Land Use Category by Island/Province

Unit: %

Island/Province	Lowland Paddy	Arable Upland	Grassland/ Fallow land	Swamp/ Water	Estates	House Compound	Forest/Wood /Bush	Total Area
Sumatera	26.9	32.9	28.3	35.0	51.0	35.1	20.1	24.7
Jawa	42.6	23.7	1.2	3.2	5.7	33.3	2.8	6.9
Bali, Nusa Tenggara & Timor	5.3	7.7	16.6	0.4	3.3	4.4	3.5	4.6
Kalimantan	15.3	16.8	25.1	28.7	18.7	13.0	31.7	28.1
Sulawesi	9.9	11.6	13.4	4.7	14.0	8.3	9.3	9.9
Maluku & Irian Jaya	0.1	7.2	15.4	27.9	7.2	5.8	32.6	25.9
Whole Indonesia	100.0 (4.4)	100.0 (6.9)	100.0 (6.4)	100.0 (3.9)	100.0 (6.1)	100.0 (2.6)	100.0 (69.7)	100.0 (100.0)

Source: Agricultural Survey, Land Area by Utilization in Java 1990; CBS
 Agricultural Survey, Land Area by Utilization in Outer Java 1990; CBS
 Statistik Indonesia 1991; CBS
 Regional Physical Planning Project for Transmigration, 1990; Ministry of Transmigration

2.1.2 Economic Growth, Employment and Productivity

Since 1969 when the first five-year development plan (REPELITA I) started Indonesian economy has grown steadily with average annual growth rate of more or less 7% although it experienced less growth rate for certain period due to the collapse of oil price. In 1989 GDP totaled 104.2 billion rupiahs at 1983 constant price.

Agricultural sector including food crops, estates, forestry and fisheries has played a leading role in economic growth during the period. In 1969/71 the agricultural sector accounted for almost half of the total GDP. Among others food crops, especially rice contributed more than

25% of total GDP. Although the agricultural sector has grown, the growth rate has decreased from more than 4% during 1965/80 to 3% during 1980/90. Besides other sectors have grown rather higher rate than the agricultural sector. Hence the share of the agricultural sector GDP in total GDP declined from 45% in 1969/71 to 21% in 1989. The change in the share of each sector GDP in total GDP at 1983 constant market prices between 1983 and 1989 is as shown below (also refer to Table 2.3):

GDP by Sector in 1983 and 1989

Unit: Billion rupiah

Sector	GDP in 1983	GDP in 1989	Growth Rate (% share)	Growth Rate (annual ave. %)
Agriculture, Forestry and fisheries	16,118	22,184	21.3	5.5
Food Crops	9,842	13,211	12.7	5.0
Others	6,276	8,973	8.6	6.1
Mining and quarrying	13,942	16,006	15.4	2.3
Industry	12,927	23,933	23.0	10.8
Manufacturing	9,567	19,221	18.4	12.3
Construction	3,360	4,712	4.5	5.8
Electricity, gas and water supply	603	1,250	1.2	12.9
Wholesale and retail trade & restaurants	11,557	17,970	17.2	7.6
Transportation, storage & communications	4,333	6,545	6.3	7.1
Finance, Insurance, real estate & business services	3,717	5,850	5.6	7.9
Public Services	5,168	7,004	6.7	5.2
Others	2,453	3,467	3.3	5.9
Total	70,818	104,210	100.0	6.6

Source: Regional Income of Provinces in Indonesia by Industrial Origin 1983-1989, CBS 1992

Agricultural sector also has contributed much to employment absorption. In 1971 more than 60% of total work force or 24.3 million worked in the agricultural sector. Even at present (1990), about 56% of total work force work in the sector (refer to Table 2.4). As shown in Table 2.4 agriculture is still a dominant employment absorbing sector in outer Jawa. In Nusa Tenggara Timur and Timor Timur, in particular, more than 80% of total workers are engaged in agricultural sector. Recent BAPPENAS report¹ reveals that employment distribution pattern among sectors have not changed recent several years.

Reflecting the small share in GDP and large share in employment, labor productivity of agricultural sector is lower at a value of Rp.0.5 million/labor as of 1990 while average labor activity of all sectors is Rp.1.4 million/labor (refer to Table 2.5). This low productivity results in the lower income in the agricultural sector in general, which will be one of the main issues

¹ L. Fletcher and T. Kesavan. *Planning Indonesia's Agricultural Future: An Analytical Approach*, Bureau of Agriculture and Irrigation, BAPPENAS, December 1992

when considering the future agricultural development. Employment and productivity by main sector as of 1990 is as shown below:

Workers and Productivity by Sectors, 1990

Sectors	Workers Population *1		Productivity *2 ('000 Rp./worker)
	('000 person)	(share, %)	
Agriculture, forestry and fisheries	42,378	55.9	524
Mining & Quarrying	528	0.7	30,302
Manufacturing	7,693	10.1	2,498
Electricity, gas & water	135	0.2	9,275
Construction	2,060	2.7	2,288
Wholesale and retail trade and restaurant	11,067	14.6	1,624
Transportation and communication	2,313	3.1	2,831
Finance, insurance, real estate and other businesses	605	0.8	15,365
Public services	9,070	12.0	772
Whole Indonesia	75,851	100.0	1,374

Source: *1: Statistical Year Book of Indonesia 1991, Central Bureau of Statistics

*2: Consultant's estimates by dividing sector GDP by workers population

Note: *1: Workers population refers to 10 years of age and above who worked during the week previous to the survey.

2.1.3 Expenditure and Calorie Consumption

Based on the SUSENAS survey, monthly per capita expenditure has increased during these 6 years between 1984 and 1990 in both urban and rural areas, as shown below (also refer to Table 2.6).

Percentage of Population Distribution
by Monthly per Capita Expenditure Class

Year	Area	Monthly per capita expenditure class				Total
		Less than 10,000	10,000 - 19,999	20,000 - 39,999	40,000 - and over	
1984	Urban	8.8%	39.5%	38.8%	12.9%	100.0%
	Rural	39.4%	47.0%	12.1%	1.5%	100.0%
	Total	32.2%	45.3%	18.3%	4.2%	100.0%
Year	Area	Monthly per capita expenditure class*				Total
		Less than 9,757	9,757 - 19,513	19,514 39,025	39,026 and over	
1990	Urban	4.4%	35.6%	41.6%	18.4%	100.0%
	Rural	21.3%	58.8%	19.7%	2.2%	100.0%
	Total	15.5%	51.1%	26.3%	7.1%	100.0%

Source: Pengeluaran Untuk Konsumsi Penduduk Indonesia 1990, Buku 1, CBS

Note: *: expenditure class in 1990 are deflated by using GDP deflator to the 1984 constant prices level for making easy comparison.

As a result, in 1990, monthly per capita expenditure has reached to Rp.44,029 for urban area, Rp.24,296 for rural area and Rp.30,271 for whole nation on an average, respectively, as shown on Table 2.7.

Expenditure pattern is different between urban and rural areas. People in urban areas, where expenditure level is higher, expend more to non-food commodities, while those in rural areas expend much more to food commodities, high Engel co-efficient (see Table 2.7). Urban people expend far more for housing, gas and electricity than rural people. It is interesting that the amount of monthly per capita expenditure to food commodities is not so different between urban and rural areas.

Calorie consumption pattern differs by expenditure class. According to the results of the SUSENAS survey conducted in 1990, total calorie consumption increase with the expenditure class up to more than Rp.100,000/month, while calorie consumption from cereals increase up to Rp.30,000/month to Rp.39,999/month then tends to decrease as shown below.

Average Daily per Capita Consumption of Calorie by Commodity Group and Monthly per Capita Expenditure Class 1990

Commodity Group	Unit: Cal/day											per capita average
	Less than 8000	8000 9999	10000 14999	15000 19999	20000 29999	30000 39999	40000 59999	60000 79999	80000 99999	100000 159999	150000 and over	
1. Cereals	791	998	1,109	1,217	1,311	1,322	1,285	1,224	1,185	1,196	1,053	1,247
2. Tubers	390	215	158	121	101	84	71	59	52	44	40	107
Sub-total	1,181	1,213	1,267	1,337	1,412	1,406	1,356	1,282	1,237	1,241	1,093	1,354
3. Fish	9	14	21	29	40	48	53	56	58	57	63	38
4. Meat	3	3	5	7	14	25	39	59	76	99	130	20
5. Eggs and milk	1	2	4	8	15	27	46	64	87	99	117	22
Sub-total	13	19	30	44	68	100	138	179	221	255	309	80
6. Vegetables	44	33	34	37	40	44	45	48	50	52	44	40
7. Legumes	12	21	26	35	46	60	74	89	97	104	106	49
8. Fruits	16	18	24	31	41	53	61	70	76	87	98	43
Sub-total	72	72	84	103	127	157	181	206	223	243	248	132
9. Oil and fats	94	102	132	162	201	239	264	289	304	319	324	201
10. Others	32	48	72	96	127	163	195	235	266	293	346	134
Total	1,392	1,453	1,585	1,742	1,935	2,066	2,134	2,192	2,251	2,351	2,321	1,901

Source: Konsumsi Kalori dan Protein Penduduk Indonesia dan Propinsi 1990; CBS, 1992

It means that calorie consumption pattern changes at a certain expenditure level. People who expend more tend to take more calorie from protein food, especially meat, or vegetables which

are high value commodities. However, careful examination may be needed in this regards since food consumption pattern differs from province to province as shown on Table 2.8. For example in most provinces of Sumatera, Kalimantan, Sulawesi, Maluku and Irian Jaya, people whose expenditure level is not high take more calorie from fish.

As for rice, by far main cereal crops in Indonesia, it is still the main calorie source. Assuming rice consumption pattern is parallel to cereal calorie consumption pattern, rice consumption will increase with expenditure increase up to the level of Rp.20,000/month to Rp.29,999/month. Under the low expenditure (or income) level, rice (or cereals) is the best food from the viewpoint of cost performance of both energy and protein as shown below.

Unit Cost of Energy and Protein by commodity

	Energy (Rp./Cal)	Protein (Rp./g)
FOOD	9.07	379.32
1. Cereals	4.38	226.79
2. Tubers	2.85	345.45
3. Fish	44.69	244.37
4. Meat	44.11	674.05
5. Eggs and milk	38.60	624.81
6. Vegetables	40.12	567.72
7. Legumes	15.09	159.57
8. Fruits	23.46	1,972.55
9. Other food items	8.25	1,005.17
10. Prepared food	292.75	13,945.45
11. Alcoholic beverages	0.32	13.19
12. Tobacco & betel	9,466.67	

Source: Konsumsi Kalori dan Protein Penduduk Indonesia dan Propinsi 1990

2.1.4 Social Development Situation

Development level of public social infrastructure is one of the indicators to measure the situation of the ordinary life of people. Basic infrastructure includes road, water supply, electricity, hospital, school, etc.

(1) Road Development

Road network has been established remarkably. Total road length increased from 95,000 km in 1972 to 266,000 km in 1989 with average construction length of 10,000 km/year (refer to Table 2.9). As of 1989, asphalt road accounts for more than 116,000 km or some 44% of total road length. More investment have been put on Jawa and Sumatera where road length has

increased by some 5,000 km annually since 1984. Average road density is 138 m/km² as of 1989, although the value differs from region to region. Jawa has the most dense road network with 542 m/km² (excluding DKI Jakarta), while Kalimantan and Irian Jaya have scarce with less than 100 m/km² probably due also to scarce population. Road length and road density by province as of 1989 is shown on Table 2.10 and summarized below:

Length of Road and Road Density by Province/Island as of 1989

Province	Total Road Length (km)	Road Density (km/km ²)
Sumatera	84,622	178.7
Jawa	71,692	542.4
Bali & Nusa Tenggara	26,121	295.2
Kalimantan	28,264	52.4
Sulawesi	42,446	224.3
Maluku & Irian Jaya	13,181	26.6
Indonesia	266,326	138.8

Source: Statistical Year Book of Indonesia 1991, Central Bureau of Statistics.

(2) Water Supply

Water supply facilities has not been established well so far. Out of 38.9 million household as of 1991, only 21% are supplied water through pipe system or pump. With the exception of DKI Jakarta where pipe system and pump cover almost 90% of household, most people in other areas depend their domestic water on well and river. Piped water system is established only within big cities. Percentage of household by type of water sources and province is as shown on Table 2.11 and summarized below.

Percentage of Household by Type of Water Sources and Province/Island

Province/Island	Pipe	Pump	Well	Spring	River	Others	Total
Sumatera	10.2	2.1	62.3	8.5	10.5	6.4	100.0
Jawa	12.5	12.2	57.2	14.5	2.0	1.6	100.0
Bali & Nusa Tenggara	17.2	4.9	40.3	26.9	7.3	3.4	100.0
Kalimantan	16.8	7.5	16.9	0.6	44.8	13.6	100.0
Sulawesi	18.3	3.3	59.1	12.8	5.4	1.1	100.0
Maluku & Irian Jaya	14.1	1.5	41.2	17.8	19.0	6.5	100.0
Indonesia	12.9	8.9	55.2	13.3	6.4	3.2	100.0

Source: Statistical Year Book of Indonesia 1991, CBS.

(3) Electricity

Since data on electrification development is not available, electricity use as source of lighting will be used as an indicator. Main lighting source in Indonesia is kerosene. About 56% of national total household use kerosene or pressure lamp as a lighting source. The rest or 44% of total household use electricity. DKI Jakarta is the highest electricity-use area with rate of

93%, while Timor Timur shows the lowest with only as low as 9%. The use of electricity as a lighting source differs from province to province. It does not necessarily mean that electrification rate is proportional to electricity-use rate. Unit cost per energy being lower in Kerosene than in electricity, income level may be related with the use rate. Percentage of household by type of lighting source and province is as shown on Table 2.12 and summarized below:

Percentage of Household by Type of Lighting Source and Province/Island

Province/Island	Electricity	Pressure Lamp	Kerosene	Others	Total
Sumatera	38.3	15.7	45.9	0.1	100.0
Jawa	47.5	9.2	43.2	0.1	100.0
Bali & Nusa Tenggara	36.0	7.2	56.5	0.3	100.0
Kalimantan	41.4	6.4	52.0	0.2	100.0
Sulawesi	36.7	15.0	47.5	0.9	100.0
Maluku & Irian Jaya	26.9	18.6	36.3	18.2	100.0
Indonesia	43.8	10.7	45.0	0.5	100.0

Source: Statistical Year Book of Indonesia 1991, Central Bureau of Statistics.

(4) Cooking Fuel

Firewood/charcoal is by far dominant cooking fuel in Indonesia. Some 70% of total household use firewood/charcoal as cooking fuel. In DKI Jakarta and oil producing provinces of Riau in Sumatera and Kalimantan Timur people tend to use more kerosene than other province. The use of gas and electricity is not common so far. Percentage of household by type of cooking fuel and province is as shown on Table 2.13 and summarized below:

Percentage of Household by Type of Cooking Fuels and Province/Island

Province/Island	Electricity	Gas	Kerosene	Firewood/ Charcoal	Others	Total
Sumatera	1.0	0.9	23.1	74.9	0.1	100.0
Jawa	0.7	1.8	31.1	65.6	0.8	100.0
Bali & Nusa Tenggara	0.5	0.4	12.3	86.6	0.2	100.0
Kalimantan	0.7	0.5	22.2	76.5	0.1	100.0
Sulawesi	0.4	1.5	16.3	81.7	0.0	100.0
Maluku & Irian Jaya	0.5	0.3	17.5	81.7	0.2	100.0
Indonesia	0.8	1.4	26.9	70.4	0.5	100.0

Source: Statistical Year Book of Indonesia 1991, Central Bureau of Statistics.

(5) Education

Illiterate population rate by age group shows history of improvement as a result of education development. As shown below only 2.5% of population in an age group between 10 and 19

are illiterate while 20% of population aged over 40 are illiterate. Overall illiterate percentage decreased to 15.8% in 1990 from 19.1% in 1985.

Percentage of Population Aged 10 Years and Over Illiterate
by Age Group and Place of Residence

Age Group	Urban	Rural	Total
10-14	0.93	3.04	2.41
15-19	0.81	3.61	2.62
20-24	1.69	7.32	5.19
25-29	3.68	12.63	9.56
30-34	5.00	16.38	12.59
35-39	5.63	19.71	15.34
40-44	9.33	27.56	22.22
45-49	13.01	34.07	27.94
50+	30.77	52.42	46.57
Not Stated	18.72	32.70	29.46
Total	7.57	19.71	15.83

Source: Statistical Year Book of Indonesia 1991; Central Bureau of Statistics

In 1990, school attending percentage in 10-14 years age group is as high as 90% in urban area and 81% in rural area, respectively, as shown Table 2.14. The number of pupils per one teacher in primary school is 23.3, ranging from 17 in Bali to 31 in Lampung, showing adequate ratio.

(6) Health

During 1987 - 1990, number of beds in hospitals have increased by 6, 400 at annual rate of 1.8% (refer to Table 2.15). Total number of bed is some 121,000 as of 1990, which is about 67 beds per 100,000 people. Number of beds per unit number of people differs much from province to province. The value at DKI Jakarta is the highest with 197 while Nusa Tenggara Barat the lowest with only 24. The number of physicians as of 1990 is 25,752, and that of nurses/midwives is almost 100,000. Both number increased steadily during 1985 to 1990 at annual increase rate of 6.3% for physicians, and 17% for nurses/midwives, respectively. From the above, it can be said that although medical services have not been facilitated to all people so far, its quality tends to improved.

2.1.5 Public Finance

(1) Central Government Budget

A total domestic revenues in 1990/91 was Rp.39,550 billion which consist of Rp.17,710 billion (45%) from oil and gas selling, Rp.19,720 billion (50%) from tax revenues and Rp.2,120 billion (5%) from others. While the total expenditures in 1990/91 is Rp.46,654 billion consisting of Rp.29,998 billion of routine expenditures and Rp.16,656 billion of development expenditures. The trend of this government budget in recent four years is shown in Figure 2.1 and Table 2.16 and 2.17 shows the breakdown of the government total revenues and expenditures in recent four years respectively and summarizes below.

Actual Central Government Revenues and Expenditures

	(000,000,000 Rp.)			
	1987/88	1988/89	1989/90	1990/91
I. REVENUES	26,961	32,995	38,169	49,451
1. Domestic Revenues	20,803	23,004	28,740	39,546
- Oil & Gas	10,047	9,527	11,252	17,712
- Tax	8,779	11,908	15,426	19,719
- Others	1,977	1,569	2,062	2,115
2. Financial aid	6,158	9,991	9,429	9,905
II. EXPENDITURES	26,959	32,990	38,165	46,654
1. Routine Expenditure	17,482	20,739	24,331	29,998
- Personnel Expenditures	4,617	4,998	6,201	7,053
- Material Expenditures	1,329	1,492	1,702	1,830
- Subsidies To Autonomous Region	2,816	3,038	3,566	4,237
- Interest And Debts Repayment	8,205	10,940	11,939	13,395
- Others	515	271	923	3,483
2. Development Expenditures	9,477	12,251	13,834	16,656
- Development Projects	4,047	4,301	5,412	7,822
- Aid Projects	5,430	7,950	8,422	8,834
II. BALANCE (I-II)	2	5	4	2,797

Source : Statistical Year Book of Indonesia 1991,1990,1989, Central Bureau of Statistics

The share of each item of revenue and expenditure to their total amount were almost same in recent four years as tabulated below.

Share of Revenues and Expenditures

	1987/88	1988/89	1989/90	1990/91
I. REVENUES	100 %	100 %	100 %	100 %
1. Domestic Revenues	77%	70%	75%	80%
- Oil & Gas	37%	29%	29%	36%
- Tax	33%	36%	40%	40%
- Others	7%	5%	5%	4%
2. Financial aid	23%	30%	25%	20%
II. EXPENDITURES	100 %	100 %	100 %	100 %
1. Routine Expenditure	65%	63%	64%	64%
- Personnel Expenditures	17%	15%	16%	15%
- Material Expenditures	5%	5%	4%	4%
- Subsidies To Autonomous Region	10%	9%	9%	9%
- Interest And Debts Repayment	30%	33%	31%	29%
- Others	2%	1%	2%	7%
2. Development Expenditures	35%	37%	36%	36%
- Development Projects	15%	13%	14%	17%
- Aid Projects	20%	24%	22%	19%

Source : Statistical Year Book of Indonesia 1991,1990,1989, Central Bureau of Statistics

Development expenditures by sector in three years from 1988/89 to 1990/91 are presented in Table 2.18. Agriculture and irrigation sector shares the second largest expenditure following communication and tourism sector in these three years. Major five large sharing sectors and its expenditures & shares are summarized below.

Development Expenditure and its Share

Sector	1988/1989		1989/1990		1990/1991	
	Value	Share	Value	Share	Value	Share
Communication and Tourism	1,654	19%	2,522	19%	3,042	19%
Agriculture and Irrigation	1,300	15%	1,994	15%	2,392	15%
Education, Culture and Youth	1,076	12%	1,683	13%	2,065	13%
Mining and Energy	1,217	14%	1,615	12%	1,973	12%
Regional and Local Development	1,032	12%	1,552	12%	1,873	12%
Others	2,609	29%	4,223	29%	4,880	30%
Total	8,888	100%	13,130	100%	16,225	100%

Source : Statistical Year Book of Indonesia 1991,1990,1989, Central Bureau of Statistics

(2) Local Government Budget

The sources of revenue for local governments are;

- 1) Central government grants,
- 2) Assigned revenue, levied by the central government but assigned wholly or partly to regional government,
- 3) Revenue from local taxes and service charges, and
- 4) Funds channeled through the banking system.

Among the above, central government grants are the most important sources of revenue for local governments. In 1990/91 about 10 % of total expenditure or about Rp.4,200 billion were transferred from central government budget to local government budget (see Table 2.17). Table 2.19 shows actual receipts and expenditure of four local governments i.e. Daerah Otonoma Tingkat I (Provincial level), Daerah Otonoma Tingkat II (Kabupaten/Kotamadya level), Desa Urban and Desa Rural and summarized below.

Local Government Receipts and Expenditures in 1989/90

Rp. billion							
Provincial level		Kabupaten level		Desa Urban		Desa Rural	
Rec.	Exp.	Rec.	Exp.	Rec.	Exp.	Rec.	Exp.
4,312	4,014	3,007	2,881	485	482	4,505	4,483

Source : Statistical Year Book of Indonesia 1991, Central Bureau of Statistics

2.1.6 Issues for Future Development

(1) Agriculture

In the past, the agricultural sector, especially paddy, has contributed much to high growth of Indonesia economy. In line with the national policy toward self-sufficiency of rice, the Government has expended vast amount of investment to various sectors such as irrigation, rehabilitation, intensification, pricing policy, etc. all of which were conducive to rice production increase. As a result, through area expansion and yield increase, Indonesia attained the target in 1984, and the self-sufficiency has been almost maintained since then.

While the importance of agriculture sector in economic growth has declined in late 1980s, employment in agriculture sector share in total employment still remained high. This implies the decline of the labor productivity. This is the key point for considering poverty alleviation,

since labor productivity in agricultural sector is the lowest among all economic sectors. There seems three possible ways to tackle with poverty alleviation. One is to improve productivity, second is to expand agricultural area, and third is to absorb employment in other sectors. The first two options is regarding agricultural sector itself, and the third one is related to all the sectors. Poverty alleviation will not be solved within agricultural sector only. Regional development approach should be taken in this regards. In this sense, how to orient development direction or to transform the economic activity is the key issue for formulating the next long term development program.

In agricultural sector, increasing productivity and area extension will be main strategies to apply for future development. Increasing productivity may have two options: (i) diversification of commodities or activity to more high value ones and (ii) increasing yield in the same crop. Paddy is said to be no more attractive commodity as neither future demand increase (low income elasticity) nor large productivity increase (higher yield level) is expected so much as before. Future paddy production program should be carefully made to pursue cost effective way, on the basis of the paddy demand projection. Diversification will naturally be promoted. In Jawa, in particular, high value crops will more be produced as the demand of such commodities will be increased with increase of income level in urban areas. Vegetables and meat are examples. Productivity should more be increased especially in outer Jawa, where yield level of crops still remains low.

Expansion of agriculture area is another option to increase output. It will more be promoted especially in outer Jawa. Agricultural area in Jawa is already almost fully developed, and the area per agricultural worker is very limited (0.3 to 0.4 ha). Fishery and estate crops sub-sector in coastal swamp and upland is prospective in this regards although big employment absorption is not expected much.

Linkage to other sectors may also be an important aspect to be considered. Small scale agro-based industry such as manufacturing canned juice should be developed in rural areas, which are conducive to poverty alleviation in terms of economic development as well as employment absorption. Once industry is introduced, various sectors including manufacturing and service sectors will follow it. Raw agricultural products will become high value commodities in such a way. Basic infrastructure such as construction of roads and electrification may be necessary.

(2) Environment

Rapid economic growth always brings about various environment conflicts such as pollution, urban slum, relocation, etc. as all developed countries experienced. Since economic

development is to create better living condition of people, such environmental problem should be avoided as much as possible. As seen in recent "Earth Summit" held in Rio de Janeiro, Brazil, environment in global scale has become common concern to be considered by all citizen in the world.

Agriculture is, needless to say, the fundamental sector for life of human being by supplying food through fixation of carbon dioxide using solar energy. It is not destructive sector to environment. However, population pressure has called for new land for food production, and disordered land development has sometimes done. Tropical forest lands, in particular, on which soils are originally infertile and susceptible to soil erosion hazard have been cleared and used extensively, which resulted in the increase in abandoned land. Soil management technique should be developed and be extended to farmers.

Too much use of farm chemicals including fertilizer and agro-chemicals has often made adverse effect to environment as eutrophication and water pollution by residual toxicity. Misuse of such commodities are not only destructive to environment but also wasteful of limited fund of farmers. Better and simple farming technology should be studied and developed for farmers use.

The efficient use of water are becoming big concern with the increase of economic activity and population. Water for domestic and industrial (D & I) use and for agriculture use will be more competitive especially in Jawa. Water resources development for multi-purpose use will more be important in this regards. It means that value of water should be increased so that high economic return is expected.

Those environmental issues should be common sense for anyone to consider. Unless ordinary citizen have such mind any efforts on environment conservation will fail.

2.2 Outline of the Second Long Term Development Plan (PJPT II)

As mentioned in Section 1.3, in March 1993, just after the election of the President, The Government issued the Outline of the National Policies (GBHN, Garis-garis Besar Haluan Negara) for the period from 1993 to 1998. The GBHN reviews the performance of the development in the First Long Term Development period (PJPT I, Pembangunan Jangka Panjang Tahap I), directs the future development aims and objectives, policies and strategies for the Second Long Term Development period (PJPT II, Pembangunan Jangka Panjang Tahap II) as well as the Sixth Five Year Development plan (Repelita VI).

Based on the GBHN, BAPPENAS translated the policy into some concrete target (or projected) figures to be attained in PJPT II as well as Repelita VI, and told concerning agencies to prepare sector plan and/or regional plan by August 1993, based on those figures. Hereunder, summary of GBHN will be overviewed, and macro socio-economic figures targeted will be presented. Overall flow of the process for formulation of PJPT II is schematized in Figure 2.2.

2.2.1 Review of the PJPT I

The economic development in the PJPT I is evaluated to be successful with notable achievements which brought about the improvement of the living standard of the Indonesian people. The goals set for the PJPT I have been successfully reached.

The self-sufficiency in rice was achieved in 1984 as a result of a series of efforts for increased food production, which includes irrigation development, intensification program, pricing policy, etc. The share of national products has significantly shifted from agriculture monopoly in 1970s to industry and service sector oriented in the late 1980s. Within industry sector, the share of non-oil and gas manufacturing industry has increased magnificently so as to replace its importance of oil-and-gas sector. Employment opportunity has also been increased with the growth of economic sectors.

Along with the economic development people welfare was also improved. Illiterate rate was remarkably reduced under the implementation of compulsory education policy for elementary school. Development in health and family planning have successfully increased the life expectancy age and have controlled the growth rate of the population, accompanied by improved housing and settlements.

Other development efforts such as infrastructure development, development in legal structure, science and technology, politics, regional development and defense and security, all of which have been conducive to the successful economic development, should not also be forgotten.

Main achievement in the Pelita V, last Pelita of PJPT I are tabulated in figures as shown on Table 2.20.

2.2.2 Issues Remained to be Solved in PJPT II

Despite of the successful achievements made in PJPT I, there are still a number of problems left unsolved. These problems should be our challenges for the upcoming PJPT II. These problems include, among other things;

- a. Low income per capita.
- b. Unequal distribution of development gains among the regions, the sectors and the groups of people.
- c. Rather high rate of population growth, accompanied by rapid urbanization. At the same time, there is still a large number of people living below the poverty line.
- d. A large number of labor force with generally low education while employment opportunities have been unable to absorb all the force.
- e. Low productivity and competitiveness due to, among other things, the inadequate ability to properly utilize, master and develop technology.
- f. The service sectors have not sufficiently developed to adequately and efficiently support the growth and optimum development.
- g. Weaknesses and obstacles in the institutional functions causing inefficiency in the economy.
- h. Decreasing natural resources and declining environmental capacity and quality.
- i. Development efforts are sometimes not coordinated among government agencies and hence not supported with society.

2.2.3 General Aims, Objectives and Strategies of PJPT II

The general objectives of PJPT II is the attainment of the desired quality of development, self-reliance in a physically and mentally peaceful and well-being condition of the Indonesian man and society.

The efforts to attain the general objectives of the PJPT II will be made through seven fields of the development, i.e., the economic field; people's welfare, education and culture field; field of religion and spiritual groups worshipping God the Almighty; science and technology field; law field; field of politics, state apparatus, information, communication and mass media; and defense and security field.

Development programs in PJPT II will still be based on the Trilogy of Development concept, that is, high economic growth, attainment of equal distribution of development gains, and supported by sustainable and dynamic national stability.

More concrete aims of PJPT II as outlined in the Outline of National Policies ("GBHN") includes:

- a. to attain the developed quality of the man and society in the efforts to get to an equal level of life with other nations.
- b. to attain a self-reliant society through enhancement of the quality of the human resources, decrease of dependability on foreign financing resources, attainment of ability to be self-sufficient for its essential needs, and having the economic capability to endure through global economic jolts.

PJPT II gives its emphasis on the economic sector as a development strategy in a broad sense, along with the human resources quality and enhanced by mutual support, interrelations and integration with other development sectors. Economic development will be directed towards the attainment of self-reliant and dependable national economy based on economic democracy in order to enhance the just and equal distribution of welfare of all the people. Interrelation among economic sectors will more be of importance. However, economic development will not be attained without the efforts to increase productivity and efficiency of human resources. Moreover, service sectors including infrastructure services should more be developed to help efficient economic development.

Economic development which exploit the land resources such as forestry and mining, must always take into account that the management of natural resources is expected to give prosperity to the people of not only the present generation but also the coming generation. Consideration to environment impact may also be an another theme when think about the coming generation.

2.2.4 Development Target in Figures in PJPT II

The above development aims and objectives have been translated into target macro socio-economic figures by BAPPENAS. These are shown on Table 2.21 and Table 2.22, and summarized below:

Projected Macro Socio-economic Indicator during PJPT II

Item	Repelita V	Repelita VI	Repelita VII	Repelita VIII	Repelita IX	Repelita X
Total GDP growth rate (%)	6.4	6.2	6.6	7.1	7.8	8.7
- Agriculture GDP growth rate (%)	2.1	3.4	3.5	3.5	3.5	3.5
- Industry GDP growth rate (%)	10.0	9.2	9.4	9.4	9.1	8.7
- Other sectors GDP growth rate (%)	6.9	6.0	6.3	6.8	8.0	9.5
Population (million)	189.1	204.4	219.4	233.6	246.5	258.2
Population growth rate (annual, %)	1.7	1.6	1.4	1.3	1.1	0.9
per capita GDP (Rp.1,000, 1989 constant)	1,177	1,472	1,888	2,499	3,446	4,993
per capita GDP (US\$, 1989 constant)	685	776	984	1,303	1,797	2,603
Economically active population (million)	145.5	161.3	176.0	190.4	204.2	217.1
Labor force participation rate (%)	55.9	57.7	57.9	59.5	61.1	62.1
Unemployment rate (%)	3.0	2.5	2.5	2.3	2.2	2.0
Working population (million)	78.8	90.7	103.2	115.9	128.1	139.9
Sector distribution of working population (%)						
- Agriculture	48.2	44.0	39.9	35.9	32.0	28.5
- Industry	12.6	14.3	15.9	17.4	19.0	20.7
- Construction	4.6	5.5	6.4	7.1	7.8	8.6
- Others	34.6	36.2	37.8	39.6	41.2	42.2

Source: BAPPENAS

Gross Domestic Products (GDP) is projected to grow at an annual growth rate of 6.2% in Repelita VI, and increase up to 8.7% in Repelita X. This high growth rate is expected to be attained due mainly to the high growth of industry sector with an annual growth rate of around 9%, while agriculture sectors will grow at a constant rate of 3.5% annually.

Population growth is projected to slow down in future. Annual increase rate will decrease from 1.6% in Repelita VI to 0.9% in Repelita X. Total population is expected to reach some 258 million in 2018, the last year of Repelita X, which is 69 million more than the population in 1993.

As a result of high economic growth, per capita GDP is expected to increase magnificently from 1.2 million rupiah in 1993 to almost 5 million rupiah in 2018, which is equivalent to US\$2,600, being higher than the present GDP values of Malaysia and Brazil.

Working population will increase with the increase of economically active population and of labor force participation rate, from 78.8 million in 1993 to 139.9 million in 2018. Sector distribution will change during PJPT II period. The share of agriculture in total labor force will decrease from 48.2% in 1993 to 28.5% in 2018, while that of industry will increase from 12.6% to 20.7% during the same period. The expected improvement in the social field is summarized below:

Expected Social Indicator during PJPT II

Item	Repelita V	Repelita VI	Repelita VII	Repelita VIII	Repelita IX	Repelita X
School Attendance Rate (%)						
- Elementary school	92.5*	95.7	96.2	96.9	97.5	98.0
- Junior high school	56.0*	62.0	69.0	78.0	88.0	98.0
- Senior high school	34.6*	40.0	51.0	60.0	71.0	80.0
- College or University	10.4*	12.0	15.0	18.0	21.0	25.0
Gross fertility rate (per one thousand)	24.5	22.5	20.7	18.8	17.2	16.1
Gross mortality rate (per one thousand)	8.3	7.8	7.5	7.4	7.4	7.4
Natural growth rate (per one thousand)	16.2	14.7	13.2	11.4	9.8	8.6
Infant mortality rate(per one thousand birth)	58	50	43	37	31	27
Life expectancy rate (year)	62.7	64.6	66.3	67.8	69.3	70.6

Remarks: *: estimated figures in 1994/95

Source: BAPPENAS

School attendance rate in the elementary school, junior high school, senior high school and university will increase from 92.5%, 56%, 34.6% and 10.4% respectively in the first year of Repelita VI to 98%, 98%, 80% and 25% respectively in the final year of Repelita X.

Gross mortality rate per one thousand people and infant mortality rate per one thousand births will decline progressively through PJPT II, from 8.3 to 7.4 for gross mortality rate and from 58 to 27 for infant mortality rate respectively. Meanwhile the life expectancy rate in the same period will increase from 63 years to 71 years.

The total fertility rate and gross birth rate will decline more rapidly than the mortality rate, so that the natural growth in PJPT II is expected to drop from 16.2 to 8.6 per thousand people.

2.3 The Sixth Five-Year Development (Repelita VI)

2.3.1 General Policy and Objectives of the Repelita VI

As a first five-year development in PJPT II, the Repelita VI has the following objectives:

- (1) To promote the attitude and enthusiasm of self-reliance of the Indonesian man and society in the bid of improving the quality of the human resources in the efforts to attain material and spiritual welfare in a more harmonious, just and equitable manner.
- (2) To establish a solid base for development in the following development stages.

With the establishment of economic field as the prime mover of the PJPT II, along with the qualified human resources, the Repelita VI put emphasis on enforcement of the linkage among economic sectors including agriculture and industry and on improvement of the quality of human resources.

As a continuation of the development activities based on the achievements of the previous development efforts, the development policies of the Sixth Five-Year Development are directed towards improving the quality of the man and the quality of life of the society so as to be more developed and self-reliant.

The development policies in Repelita VI are based on the Trilogy of development, the same policies for PJPT II; that is:

- a. Equal distribution of development undertakings and development gains in the efforts of attaining the prosperity with social justice of the whole people of Indonesia.
- b. Sufficiently high economic growth.
- c. Healthy and dynamic national stability.

The three respects of the Trilogy of Development are interrelated and should be applied in a reconciled, integrated and mutually-strengthening manner. Sufficiently high rate of economic growth should be attained through increasing reliability of improved national efficiency and productivity established by the active and extensive participation of the people encouraged by enthusiasm of partnership in business. The development gains must be equally shared by the people and national stability could be established as well as ensured preservation of the functions of the living environment.

2.3.2 Development Target in Figures in Repelita VI

Targeted figures to be achieved in Repelita VI have been announced by BAPPENAS. They are shown on Table 2.23, and summarized as below:

Targeted Macro Socio-Economic Indicators in Repelita VI

Item	Pelita V		Pelita VI			
	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99
Population (million people)	189.1	192.2	195.3	198.3	201.4	204.4
Population growth rate (%)	1.7	1.6	1.6	1.6	1.5	1.5
Total GDP growth rate (%)	6.0	6.0	6.0	6.2	6.4	6.6
- Agriculture (%)	3.0	3.3	3.4	3.5	3.5	3.5
- Mining and Quarrying (%)	3.9	3.3	3.4	3.5	3.5	3.5
- Manufacturing Industry (%)	9.1	9.3	9.1	8.9	9.2	9.4
Manufacturing without oil/gas	10.0	10.0	10.1	10.3	10.5	10.7
- Construction (%)	7.5	8.0	8.0	8.3	8.5	8.7
- Trade (%)	6.8	6.8	6.8	7.0	7.0	7.0
- Communication (%)	7.0	7.4	7.4	7.8	8.0	8.6
- Others (%)	4.8	5.0	5.3	5.5	5.6	5.8
GDP (million US\$, 1989 constant price)	129	135	140	146	152	159
per capita GDP (US\$, 1989 constant price)	685	700	716	734	754	776
GDP share by sector (1989 constant, %)						
- Agriculture (%)	20.1	19.6	19.1	18.6	18.1	17.6
- Manufacturing Industry (%)	21.2	21.9	22.5	23.1	23.7	24.4
- Others (%)	58.7	58.5	58.4	58.3	58.2	58.0

Source: BAPPENAS

Population will increase by some 15 million from 189.1 million in 1993/94 to 204.4 million in 1998/99. Population growth rate in the same period is expected to decrease by 0.1%.

GDP will steadily increase at annual growth rate of 6.0 % in 1993/94 to 6.6% in 1998/99. The expected leading sector is manufacturing industry which is expected to grow more than 10% without petroleum and gas sectors. Construction sector (more than 8% of annual growth) and Communication sector (nearly 8% of annual growth) are also expected to be engines for economic development. On the other hand, agriculture sector growth will remain low with annual growth rate of 3.4% on an average.

As a result, GDP will increase from US\$129 million in 1993/94 to US\$159 million in 1998/99, based on 1989 constant price). Per capita GDP will also increase from US\$685 in 1993/94 to US\$776 in 1998/99.

Due to rather high economic development in other sectors, the share of agriculture GDP in total GDP will decline from 20.1% in 1993/94 to 17.6% in 1998/99. While in manufacturing industry sector, the share in total GDP will increase from 21.2% in 1993/94 to 24.4% in 1998/99.

Targeted Labor Situation in Repelita VI

Item	Pelita V		Repelita VI				
	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	
Economically active population (million)	145.5	148.9	152.3	155.4	158.4	161.3	
Labor force participation rate (%)	55.9	56.1	56.4	56.7	57.2	57.7	
Unemployment rate (%)	3.0	3.0	2.9	2.6	2.6	2.5	
Working population (million)	78.8	81.1	83.5	85.9	88.3	90.7	
Sector distribution of working population							
- Agriculture	(million)	38.0	38.4	38.7	39.2	39.6	39.9
	(%)	48.2	47.3	46.4	45.6	44.8	44.0
- Industry	(million)	9.9	10.5	11.1	11.7	12.3	13.0
	(%)	12.6	12.9	13.3	13.6	13.9	14.3
- Construction	(million)	3.6	3.9	4.2	4.4	4.7	5.0
	(%)	4.6	4.8	5.0	5.1	5.3	5.5
- Others	(million)	27.3	28.4	29.5	30.7	31.7	32.8
	(%)	34.6	35.0	35.3	35.7	35.9	36.2

Source: BAPPENAS (also refer to Table 2.22)

Economically active population will increase by 15.8 million in Repelita VI period. While labor force participation rate will increase from 56% in 1993/94 to 58% in 1998/99, unemployment rate will decrease from 3.0% to 2.5% during the same period. Consequently working population will increase by 12 million, from 78.8 million in 1993/94 to 90.7 million in 1998/99.

Sector distribution of working population will change reflecting the change in GDP share among sectors. While the number of worker in agriculture sector will increase by only 1.9 million in Repelita VI period, that in industry sector will increase by 3 million during the same period. Construction sector will absorb another 1.4 million and other sectors will be responsible for 5.5 million.

2.3.3 Development of Agriculture Sector in Repelita VI

In Repelita VI period, agriculture development will be directed towards increasing the income and living standards of farmers and fishermen, expanding the employment and business opportunities, and supplying and expanding the market, domestic and international market, by means of developed, efficient and solid agriculture so as to be able to increase the diversification of products, improving the product quality and processing level, and to support regional development.

Rational spatial plans will be necessary so as not to reduce the prime agricultural land in future infrastructure and industry development. Participation of farmers, livestock breeders and fishermen in agriculture development through cooperatives and farmers' groups is emphasized.

Diversification, intensification, extensification and rehabilitation of agriculture must be continued and increased with more integrated planning and implementation taking into consideration the conditions of natural resources, social environment, development of other sectors, etc. Efforts in these respects will also be developed with farmers' active participation. Along with these, efforts will be made to increase the capability in managing the agriculture products particularly those linked to agro-industry and agri-business so as to enhance diversification of production and increase the value added and competitiveness of agriculture commodities. To ensure sustainable agriculture development, efforts will be made to continue and increase research and development activities which suit the need of the farmers. The farmers' capability to apply and master agriculture technology must be improved through information extension, education and training.

In food crop agriculture sub-sector, sustenance of the established self-sufficiency of food, increase the people's income, and increase the nutrition level will be emphasized through diversification of types of foodstuff. Efforts to increase production of food crop will be made through, amongst others, improving the productivity of farming, expansion of agriculture field, and increased utilization of dry lands, house yards and swamp supported by increased utilization of science and technology, provision of better infrastructures and facilities, more efficient post-harvest management and suitable price policies.

Development of irrigation will be continued by expanding the irrigation schemes so as to get more balanced in the use of water and to ensure conservation of water, protecting the production areas and preventing devastation by floods and drought, and to support the utilization of new agriculture fields, and provision of water to the people. Development of irrigation for agriculture should be increased in order to maintain the function of water resources and irrigation schemes. Irrigation development is also designed in coordination with the other water-consuming-sector planning such as settlement and industry, river maintenance, hydro-electric power development and tourism development. Maintenance and rehabilitation of irrigation schemes will continuously be increased. People's ability and participation in maintaining the irrigation canals and tertiary and quarterly structures of irrigation in self-help schemes and more efficient use of water, should be encouraged and increased through, amongst others, promoting the role of cooperatives, guidance to water-user farmers' groups.

2.4 Regional Development Plan

2.4.1 Present Development Plan and Economic Growth

Current development plan of Repelita V was launched on April 1989 with the three main development objectives (Trilogi Pembangunan), namely (1) Equity in development and its gains (2) A sufficiently high economic growth, and (3) A sound and dynamic national stability. Under this national development policy, every local government set up their own regional development plan, taking into account local problems, potentials, aspirations and social priorities. Table 2.24 present summary of each province's development plan described in Volume IV of Rencana Pembangunan Lima Tahun Kelima (1989/9 - 1993/94). All the provinces gave the development priority on agriculture and/or industry sector to attain the national and regional development target and basically adhere to policy of previous development plan of Repelita IV.

Previous Repelita IV has been achieved growth rate of 5.8 % during its plan period of 1983 to 1987. Repelita V envisages an annual growth rate of GDP of 5% and first year and second year achieved more than 5% annual economic growth rate. Table below shows GDP at 1983 constant price from 1983 to 1989.

	1983	1984	1985	1986	1987	1988	1989	
With Oil & Gas	70.7	77.0	80.3	85.1	88.8	95.8	104.3	
W/O Oil & Gas	55.1	59.8	63.5	67.6	70.6	77.3	84.4	
Annual growth rate								
With Oil & Gas		8.86%	4.33%	5.90%	4.35%	7.99%	8.83%	
W/O Oil & Gas		8.46%	6.23%	6.41%	4.49%	9.48%	9.15%	
Period of Repelita IV					5.84%			
		← Repelita IV					Repelita V →	

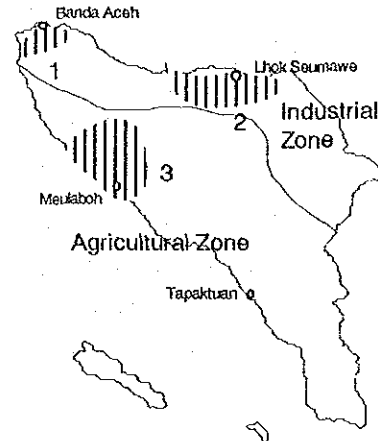
2.4.2 Future Development Plan

Current Repelita V is last phase in the first 25 Years Long Term Development Plan (1969-1994) (PJPT I) and GOI now preparing State Policy for next development plans namely second 25 Years Long Term Development Plan (PJPT II) and Repelita VI. For this reason, non of official future development plans are available at present. And these Plans will be issued in year of 1994 after submission of final report of this Study. However all the local government have been issued their future development plan under the name of Rencana

Struktur Tata Ruang Propinsi (RSTRP, Provincial Spatial development Plan) to contribute discussion for preparing PJPT II and Repelita IV. Though subject to change, RSTRP will be taken into account in this Study for formulation of long term irrigation development program. Future development plan of each province are summarized below.

1. Daerah Istimewa Aceh

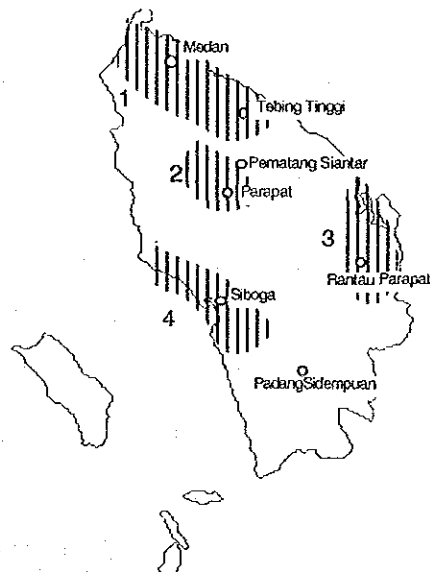
The main strategy for coming development plan is increasing efficiency and equal distribution. An economic growth rate of 6% per annum is expected. For spatial balance, province will be divided into two functional area namely industrial area and agricultural area. At the end of Repelita VI, human recourses will be 1.6 million and total population is expected 4.1 million with an annual growth rate of 2% (2.7 % at present). Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Banda Aceh and Its Surrounding zone area	Tourism Agriculture	Banda Aceh
2	Lhok Seumawe and Its Surrounding zone area	Chemical Industry Agriculture	Lhok Seumawe
3	West coast at Southern Part	Livestock Estate	Meulaboh Tapaktuan

2. Sumatera Utara

Province has endeavored to increase economic growth and development of natural and human resources, however social infrastructure and farmer's income are still low level. Province envisages an economic growth rate of 6.6% per annum to increase those level and give priority on industry, tourism and agriculture. Spatial development program is tabulated below and location is shown in Figure in right.

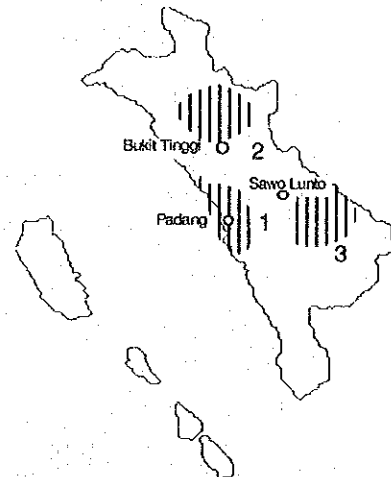


No	Zone Name	Prospective Sector	Key City/Town
1	Medan and Its Surrounding zone area	Estate Industry	Medan Tebing Tinggi

2	Pematang Sianta, Prapat and Its surrounding area.	Tourism Agriculture Estate	Pematang Siantar Parapat
3	Rantau Parapat Zone area	Agriculture	Rantau Parapat
4	Tapanuli and Its surrounding	Estate Industry Tourism	Sibolga Padang Sidempuan

3. Sumatera Barat

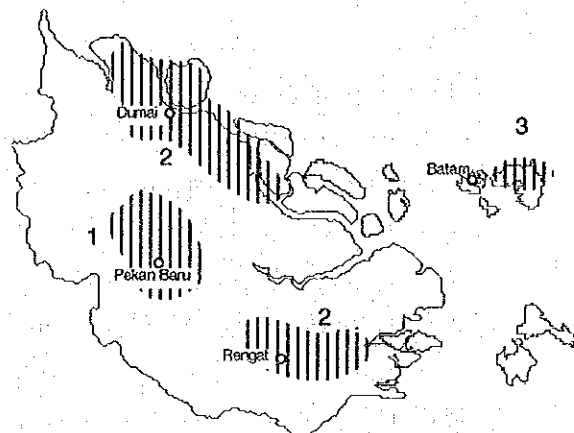
Province has enough natural and human resources potential for both industrial and agricultural development. Then the development strategy will follow government spatial development plan. Present imbalance population distribution between urban and rural will improve by the end of PJPT II. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Padang Pariaman and Its surrounding	Industry	Padang
2	Kabupaten Agam and Kotamadya Bukit Tinggi area	Tourism Food Crops Farming	Bukit Tinggi
3	Solok zone area	Transmigration Estate	Sawah Lunto

4. Riau

Under the current development plan, province performed successful development namely 7.4% of average economic growth rate, 13% decrease low income level peoples, high percapita income etc. Special attention has been paid at frontier islands Natuna and Batam by the GOI and become attractive international economic development zone. Spatial development plan, so called SIJORI (Singapura, JOhore, RIau) will develop those area more attractive but other areas of province may left behind in the development. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Pekan Baru and its surrounding	Food crops farming Government service Timber Processing	Pekan Baru
2	Dumai area _ corridor area : Rengat, Kuala Enok and its surrounding	Crude oil exploitation Crude oil refining Agriculture Estate	Dumai Rengat
3	Batam, Bulan, Bintang and Rempang zone area	Industry Tourism	Batam

5. Jambi

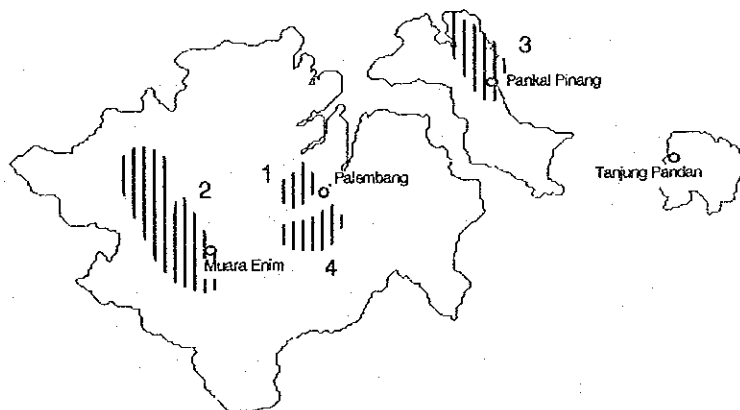
Province gives high priority on the rural area development especially agri-business and agro-industry and rural electrification for those people who live in the rural areas. All the development program should have environmental-oriented development approach and should take the local geographical condition into account. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Muara Bulian and its surrounding are	Timber industry	Jambi
2	Trans_Sumatra at western part area	Estate Agriculture	Muara Bunga Bangko Sarolangun

6. Sumatera Selatan

Province achieved 6.3% economic growth rate in Repelita V. Recent master plan forecasts that the economic structure may change from agricultural sector



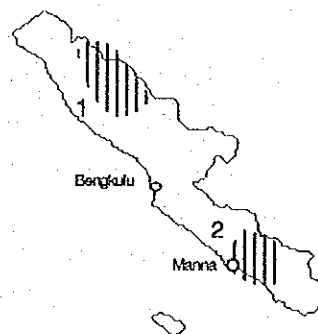
oriented to industrial sector oriented and economic growth rate may reach 7~10% per annum. Population growth rate will still be over 3% in Repelita VI for absorbing transmigrasi settler. More infrastructures such as road are required for serving estate location and transmigrasi location. Seaport facilities are also

required to promote investments in this region. Spatial development program is tabulated below and location is shown in Figure in above.

No	Zone Name	Prospective Sector	Key City/Town
1	Palembang and its surrounding area	Industry	Palembang
2	Muara enim area	Industry Agriculture	Muara Enim
3	Bangka Island zone area	Industry Agriculture	Pangkal Pinang
4	Belitung zone area	Agriculture/estate Mining	Tanjung Pandan

7. Bengkulu

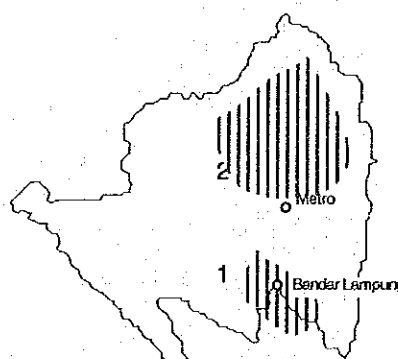
The current development constraints for this province include: poor infrastructure for transportation and communication, lack of skilled labors, less attractive business opportunity etc. At the end of PJPT II, GRDP per capita will be US\$2000 (\$310 in 1989). To attain this target, development needs for the sector other than agricultural sector. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Bengkulu _ Curup Trans. line	Agriculture Mining	Bengkulu
2	Manna area	Estate	Manna

8. Lampung

As this Province is functioning as a buffer region of the Jawa, infrastructure of transportation and communication needs special attention to develop. Natural resources of forest in Province has been made destruction year by year without any control for expansion of cultivate land and/or for wood fuel. In this regards integrated development approach will require considering environment, energy, social welfare etc. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
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1	Lampung area	Estate Industry Trading	Bandar Lampung
2	Metro area	Industry Agriculture	Metro

9. Daerah Khusus Ibukota Jakarta

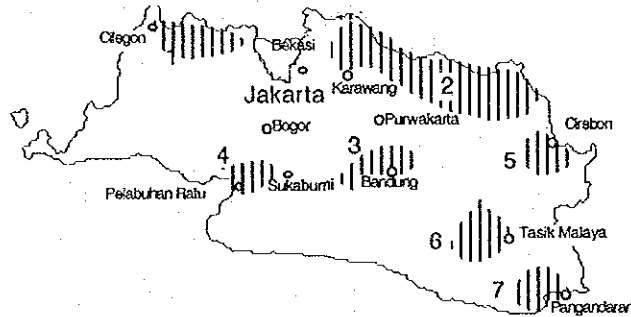
With the strategy of a "service city" and "growth center" for the country, capital city of the Indonesia has a spatial development plan covering whole region as tabulated below

No	Zone Name	Prospective Sector	Key City/Town
	DKI- Jakarta	Government service Industry Tourism	Jakarta

10. Jawa Barat

In spite of its fair condition in the Province with respect to economic welfare, social welfare of the Provinces is not good. Next PJPT II, then is focused on the

development of human resources and is expected to be improved the issues including; population density, outgoing investment and skilled manpower, environment, conversion of fertile farming land, more investment etc. Spatial development plan needs agreed and unified legends within department concern to avoid any problems which may occur by those plan. Spatial development program is tabulated below and location is shown in Figure in right.

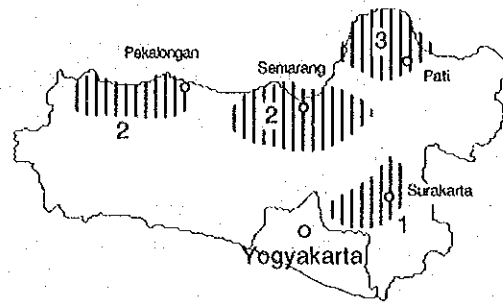


No	Zone Name	Prospective Sector	Key City/Town
1	Cilegon Area	Industry Food crops farming	Cilegon
2	The Jakarta Supporting area and North coast area	Industry Tourism Settlement	Bogor Bekasi Karawang Purwakarta
3	Great Bandung area	Industry	Bandung
4	Sukabumi and Pelabuhan Ratu	Tourism	Sukabumi Pelabuhan Ratu
5	Cirebon and its surrounding area	Industry Agriculture	Cirebon
6	Pangandaran area	Tourism	Pangandaran
7	Tasik Malaya area	Agriculture Industry Trading	Tasik Malaya

11. Jawa Tengah

In PJPT II and remaining Repelita V, present principal issues of regional development are still need to be taken into account, they are: 1) equality; 2) natural resources and environment conservation; 3) knowledge, technology and communication

issues. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Subosuko area	Agriculture Industry	Surakarta
2	Kedung Sempor area	Industry Agriculture	Semarang Pekalongan
3	Pati area	Industry Agriculture	Pati

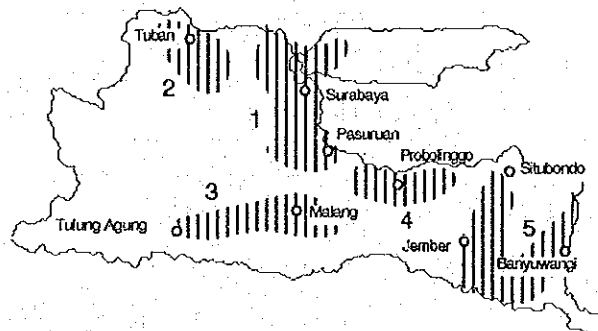
12. Daerah Istimewa Yogyakarta

Major issues and/or policy for PJPT II are summarized based on the past Repelita. They are: 1) human and regional resources; 2) regional infrastructures; 3) theoretical frame for regional development; 4) financing sources; 5) planning mechanism and institutionalization; 6) deregulation; 7) decentralization and autonomy. Province made following spatial program.

No	Zone Name	Prospective Sector	Key City/Town
	Yogyakarta area	Industry Tourism Agriculture	Yogyakarta

13. Jawa Timur

Present economic structure of the Province shows the decreasing share in agriculture sector and increasing share in non-agriculture sectors. Agricultural production however, are indicating an increasing in the contribution for national food stock. Province will make effort to keep function of granary. In year of 2000, Province expect more per capita income (\$ 2,500) than national

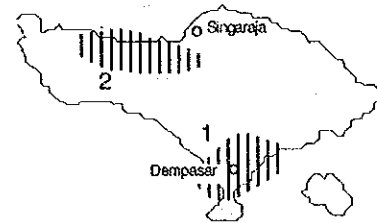


target (\$ 2,000). Spatial development program is tabulated below and location is shown in Figure in above.

No	Zone Name	Prospective Sector	Key City/Town
1	Gerbang- Kertasusilo area	Industry Agriculture Tourism	Surabaya Pasuruan
2	Tuban Area	Industry Agriculture	Tuban
3	Kediri, Malang, Tulung Agung and Blitar area	Industry Agriculture	Malang Tulung Agung
4	Probolinggo-Lumajang zone area	Agriculture Industry	Probolinggo
5	South coast at eastern area	Agriculture	Situbondo Jember Banyuwangi

14. Bali

Strategy of continuous de-concentration, decentralization and assistance will reduce the regional development gap. Provincial government needs to promote available human resources for carrying out regional development.

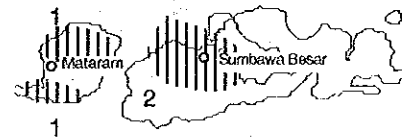


Therefore, development concept should integrate not only economic and environment aspects but socio-cultural aspect. Present development issues are; unbalanced development within regions; decreasing agricultural land and increase of urbanization. Spatial development program is tabulated below and location is shown in Figure in right.

No	Zone Name	Prospective Sector	Key City/Town
1	Denpasar, Ubud and Kintamani area	Agriculture Tourism	Denpasar
2	Singaraja - Bedugul area	Tourism	Singaraja

15. Nusa Tenggara Barat

Province has been less developed compared with other provinces since Repelita I. This resulted low per capita income, high infant mortality, small amount of regional revenue, low skilled manpower and high population growth rate. Province will make effort to change for betterment through following spatial development program.



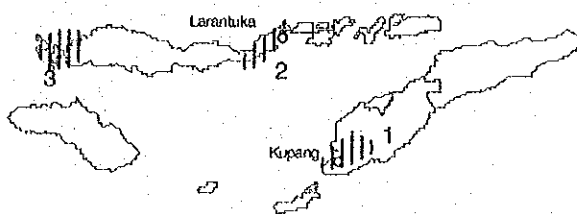
No	Zone Name	Prospective Sector	Key City/Town
1	Mataram area	Tourism	Mataram
2	Sumbawa besar area	Agriculture	Sumbawa Besar

16. Nusa Tenggara Timur

Agriculture sector shared about more than 50% to the provincial economy.

Especially cattle rising plays an important role for the

development of the Province. Within next Repelita VI, the share of private investments are expected to raise from 12% to 25%. The most significant policy for the PJPT II is to reduce the population growth rate from 2.2% to 1.7% per annum. Spatial development program is tabulated below and location is shown in Figure in right.

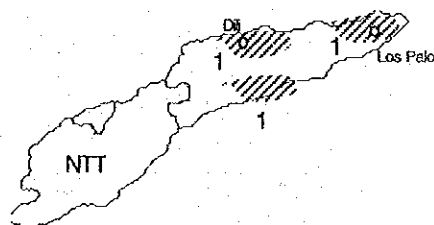


No	Zone Name	Prospective Sector	Key City/Town
1	South Kupang area	Industry Agriculture	Kupang
2	Larantuka and Its surrounding area	Agriculture Livestock	Larantuka
3	Komodo area	Tourism	

17. Timor Timur

In PJPT II some issues may still remain to be special consideration. They are; high rate of population growth (3%); improvement of social welfare; utilize sleeping agricultural land and its

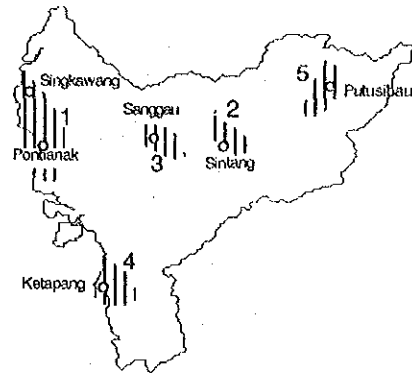
development funds; vocational training; poverty and backwardness. Among them the most crucial issue for the Province is improvement of social welfare through special activities. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
	Dili and its surrounding area	Agriculture	Soc Sau Dili Los Palos

18. Kalimantan Barat

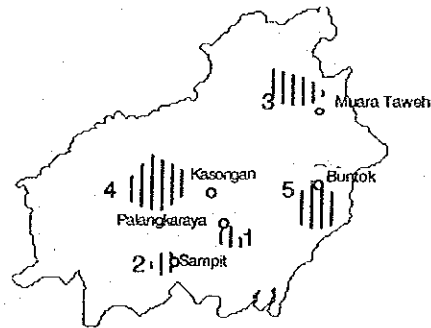
Province has vast land (28% of Indonesia) and low population (5% of Indonesia). Scattered people with such low density cause ineffective economic activity. To activate those economic potential Province will take a strategy of creation of growth center by developing the existing village and cities, supported by industries, educational facilities and transmigration. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Pontianak and its surrounding area	Industry Agriculture	Pontianak
2	Johar Sanggau area	Agriculture	Sintang
3	Singkawang area	Agriculture Industry	Sanggau Singkawang
4	Ketapang area	Industry Agriculture	Ketapang
5	Putusiban area	Agriculture	Putusibau

19. Kalimantan Tengah

Programs covered in the transportation facilities and infrastructure improvement plans in current Repelita V are to be continues in the next Repelita VI. These infrastructure and communication facilities are quite necessary for further investments. Human resources is limited and low quality.



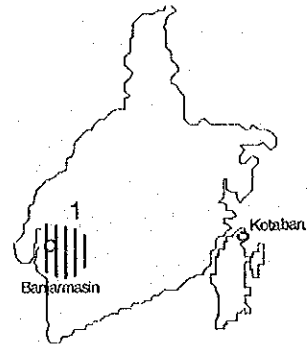
Human resource development will realize by exploring the potentials within small-sized villages through transmigration programs. Spatial development program is tabulated below and location is shown in Figure in right.

No	Zone Name	Prospective Sector	Key City/Town
1	Palangkaraya area	Estate	Palangkaraya
2	Sampit area	Agriculture	Sampit
3	Muara Taweh area	Agriculture Forestry	Muara Taweh
4	Kasongan area	Mining	Kasongan
5	Buntok	Industry Agriculture	Buntok

20. Kalimantan Selatan

Main goal of the development in Province is to improve people's living standard. During the period of 1983-1990 the average economic growth rate was reached 6.7% per annum (target 5.04%). Agriculture is the dominant sector of which share is about 30%.

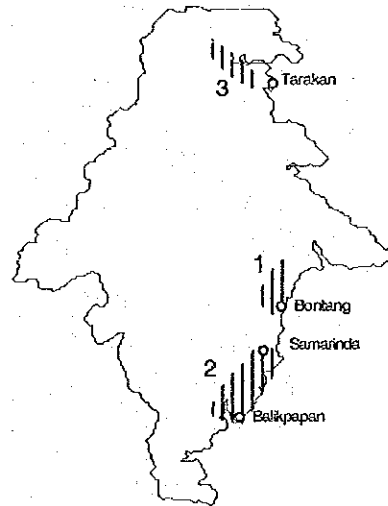
But not much contribute to improve the farmer's income. PJPT II needs to be focused not only productivity improvement but also increase of farmer's income through development of integrated agriculture and development infrastructures. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Banjarmasin area	Industry Agriculture Mining	Banjarmasin Kotabaru

21. Kalimantan Timur

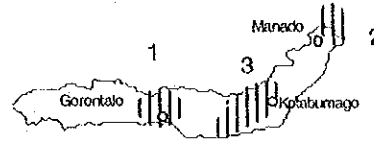
Most of the Province's economy are generated by oil and natural gas and forest products. To eliminate food crop imports from neighboring province transmigration program is effective measure. The program may more manpower be available for cultivation. Development of plantation will bring fastest equality impact to the agriculture sector however, land use plan for this plantation program may needs adjustment with Agreed Forest Area Categories. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Bontang area	Industry Forestry	Bontang
2	Balikpapan-Samarinda Line Zone area	Industry Mining Forestry	Balikpapan Samarinda
3	Tarakan_Malim area	Mining Forestry	Tarakan

22. Sulawesi Utara

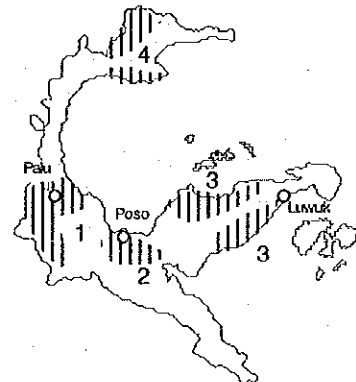
In PJPT II Province aimed at improving the human resources quality and the creation of a balanced economic structure supported by the leading sectors and based on domestic resources. Priority sectors are agro-industry, mining, tourism and transportation. To avoid the negative impacts brought by competitions of commodities between regions, spatial development plan should need due consideration of land potentials and comparative advantages of the regions. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Gorontalo area	Agriculture	Gorontalo
2	Manado area	Agriculture	Manado
3	Kotamubago area	Agriculture	Kotamubago

23. Sulawesi Tengah

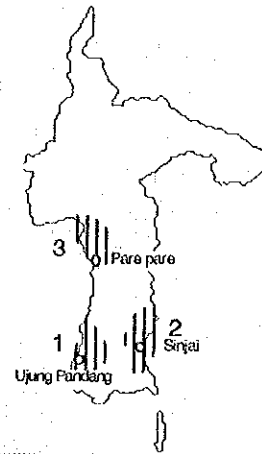
The economic growth rate of 8.8% (target 6%) has been achieved under the current Repelita. Top share of this economic earnings sector is agriculture (more than 40%). And agriculture may keep its top priority during next PJPT II. Province may face some development constraints in PJPT II. They are; complicated geographic/topographic conditions; less densely populated area; low educational level; limited development funds; lack of seaport facilities; lack of electricity. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	The area around Palu	Agriculture	Palu
2	Poso area	Agriculture	Poso
3	Luwuk area	Agriculture	Luwuk
4	Toli Toli area	Agriculture	Toli Toli

24. Sulawesi Selatan

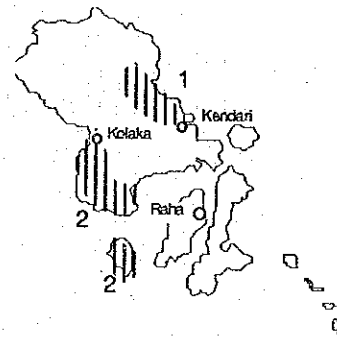
Province may end current Repelita in successfully. To increase share of local revenue to the total investments, Province need to ; activate private investments in eastern regions; promote irrigation networks throughout province into technical irrigation; enhance oceanologic survey by involving sophisticated technology; promote skilled manpower. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Ujung Pandang area	Industry Agriculture	Ujung Pandang
2	Sinjai area	Tourism Agriculture	Sinjai
3	Pare-Pare area	Agriculture Tourism	Pare-pare

25. Sulawesi Tenggara

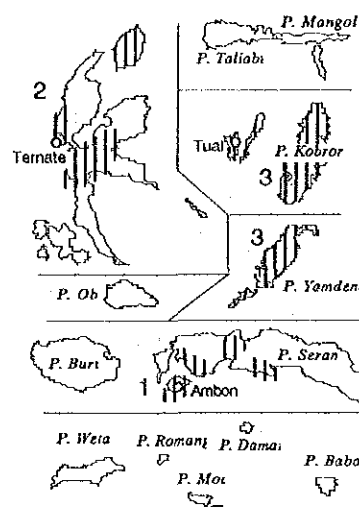
Issues which Province may encounter in Repelita VI and PJPT II are; human resources quality; population and job opportunities; poverty and social gap; imbalance development within regions. Then the policy for Repelita VI and PJPT II are; the concepts of Trilogy Development (equity, growth and stability); development priority for eastern region ; simplification of Inpres aids. One of major goal of the next Development plan is to provide more job opportunities and attracts self-motivated transmigrants. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Kendari line area	Agriculture	Kendari
2	Kolaka area	Agriculture	Kolaka Raha

26. Maluku

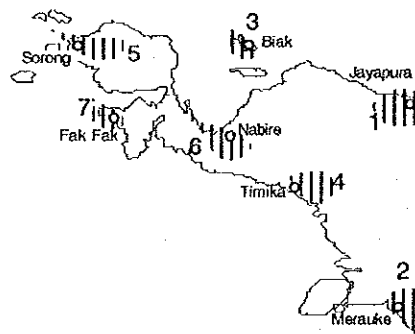
Human resources development are followed government's programs with three strategies i.e., improvement of public hygiene and health efforts; education and training promotion; improvement of public participation in the development. The most critical problems caused by archipelagic province relate to public education and public health. Inter-Island System which may establish within next Repelita, will change better and easier manner. Then the priority is given to the transportation sector followed by agriculture sector. Economic growth rate targeted by the province is 9% for the next 15 years. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Ambon Island	Agriculture	Ambon
2	North Halmahera	Agriculture	Ternate
3	South East Maluku area	Agriculture	Tual

27. Irian Jaya

In spite of good achievements during PJPT I, some similar issues are predicted to be faced in the PJPT II. Policy and strategies for the PJPT II should include; continuation of facilities and infrastructures development to uncover the isolated areas and development of potential areas; development of growth centers, improvement of human resources quality through training and education; encourage and enhance rural development program; enhancement of trades for creation and expansion of markets for local products. Spatial development program is tabulated below and location is shown in Figure in right.



No	Zone Name	Prospective Sector	Key City/Town
1	Jayapura and Its surrounding area	Forestry	Jayapura
2	Merauke and Its surrounding area	Forestry Agriculture	Merauke
3	Biak island regional area	Tourism	Biak
4	Tembaga pura area	Forestry Mining	Timika
5	Sorong area	Mining	Sorong