

No. 104

THE REPUBLIC OF INDONESIA
NATIONAL DEVELOPMENT
PLANNING BOARD
(BAPPENAS)

JAPAN INTERNATIONAL
COOPERATION AGENCY
(JICA)

THE STUDY
ON
THE THIRD UMBRELLA COOPERATION
FOR
INTEGRATED AGRICULTURAL AND RURAL DEVELOPMENT
IN
THE REPUBLIC OF INDONESIA

FINAL REPORT

MAIN REPORT

AUGUST 1996

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JICA THE STUDY ON THE THIRD UMBRELLA COOPERATION FOR INTEGRATED AGRICULTURAL AND RURAL DEVELOPMENT FINAL REPORT MAIN REPORT AUGUST 1996

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PREFACE

In response to the request from the Government of the Republic of Indonesia, the Government of Japan decided to conduct a Master Plan study on the Third Umbrella Cooperation for Integrated Agricultural and Rural Development and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Republic of Indonesia a study team headed by Dr. Shoji Kanatsu, Pacific Consultants International, from February to June 1996.

The team held discussions with the officials concerned of the Government of 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 Third Umbrella Cooperation 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.

August, 1996



Kimio Fujita
President

Japan International Cooperation Agency

Mr. Kimio Fujita
President
Japan International Cooperation Agency

Dear Sir,

Letter of Transmittal

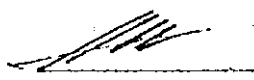
We are pleased to submit the final report entitled "The Study on the Third Umbrella Cooperation for Integrated Agricultural and Rural Development in the Republic of Indonesia". The report contains the formulation of the Third Umbrella Cooperation as well as the advice and suggestions of the authorities concerned of the Government of Japan and your Agency. The comments made by the officials concerned of the Government of Indonesia during discussions on the draft final report are also included in this report.

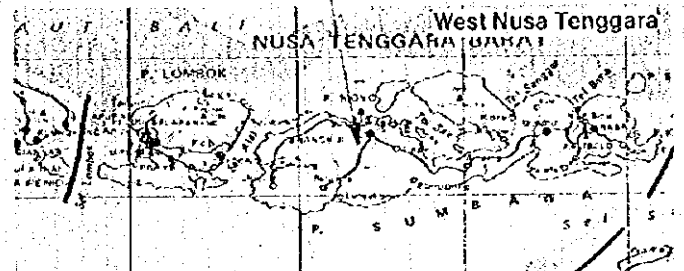
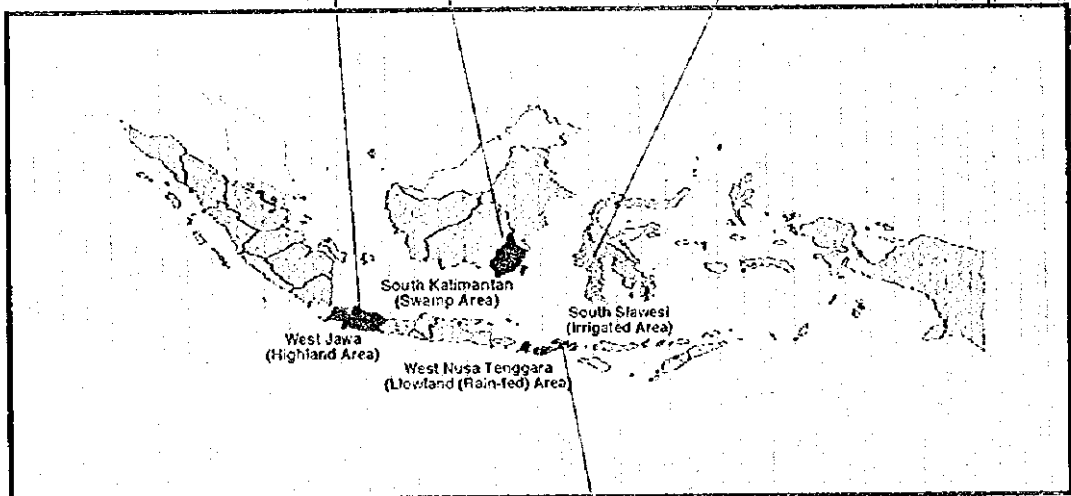
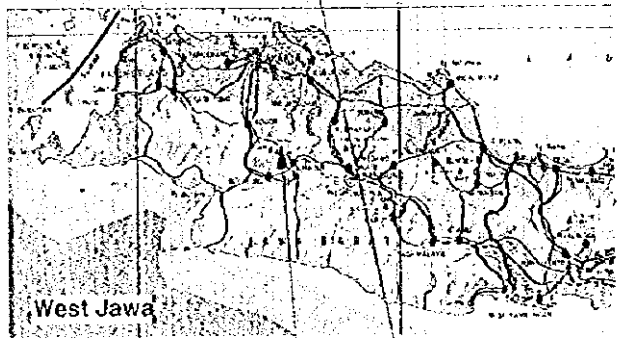
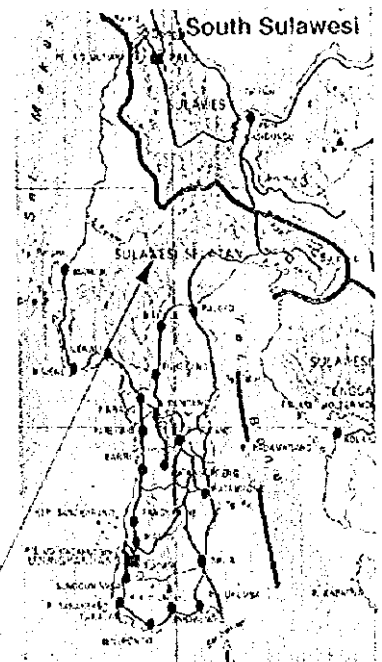
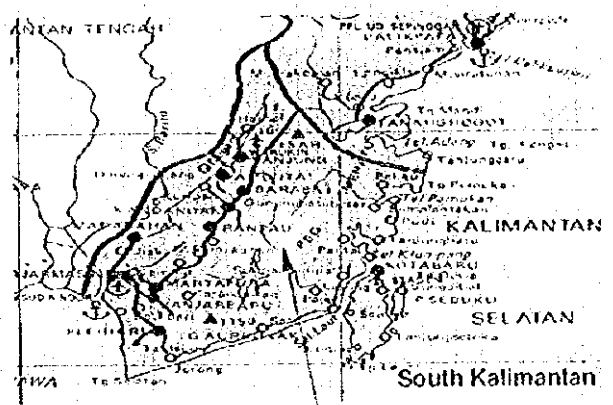
The Umbrella Cooperation is one of an epoch idea for the propulsion of the integrated agricultural and rural development in Indonesia with due consideration of obtaining the maximum synergistic effect from several projects. Based on this idea, the methodology of formulation and prioritization of the projects are suggested in this report. We recommend that the projects concerned to the integrated agricultural and rural development will be implemented based on the methodology suggested in the report.

We wish to take this opportunity to express our sincere gratitude to your Agency, the Ministry of Foreign Affairs, the Ministry of Agriculture, Forestry and Fisheries and Embassy of Japan in Indonesia. We also wish to express our deep gratitude to the officials concerned of the Government of Indonesia for the close cooperation and assistance extended to us during our field survey.

Very truly yours,

August 1996

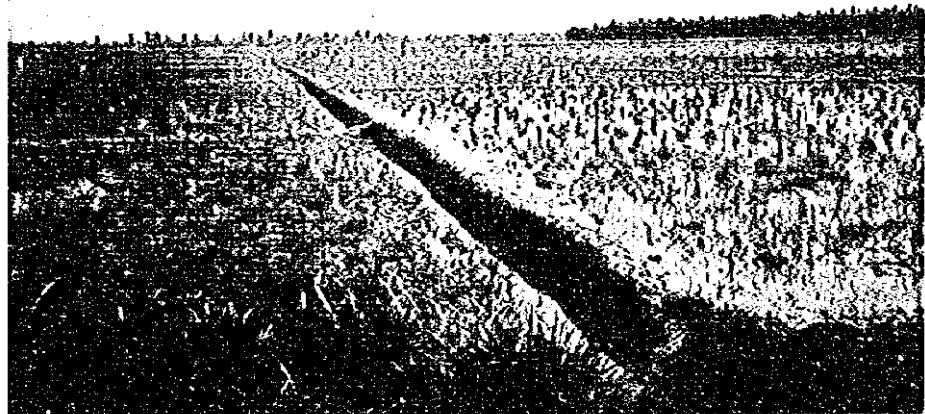

Shoji Kanatsu
Team Leader



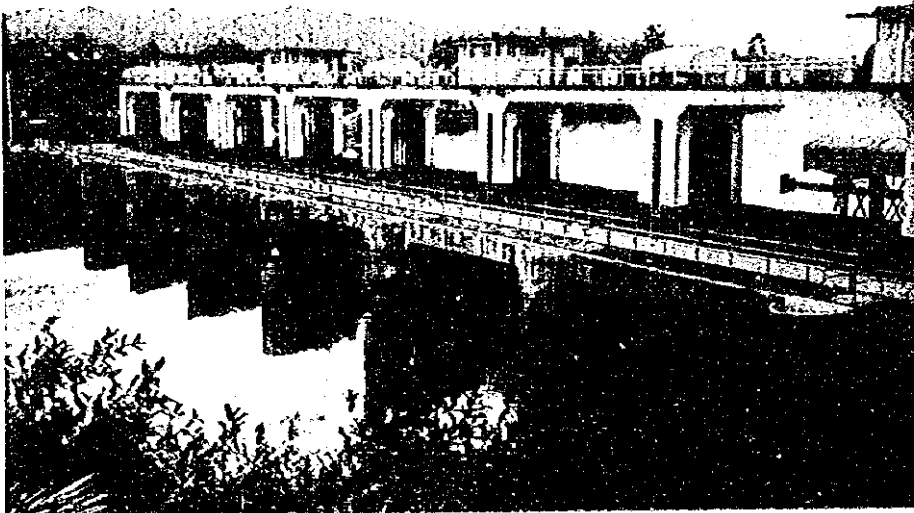
THE STUDY AREA



Landscape of Irrigated Area
(South Sulawesi Province)



Paddy Field
in the South
Sulawesi Province



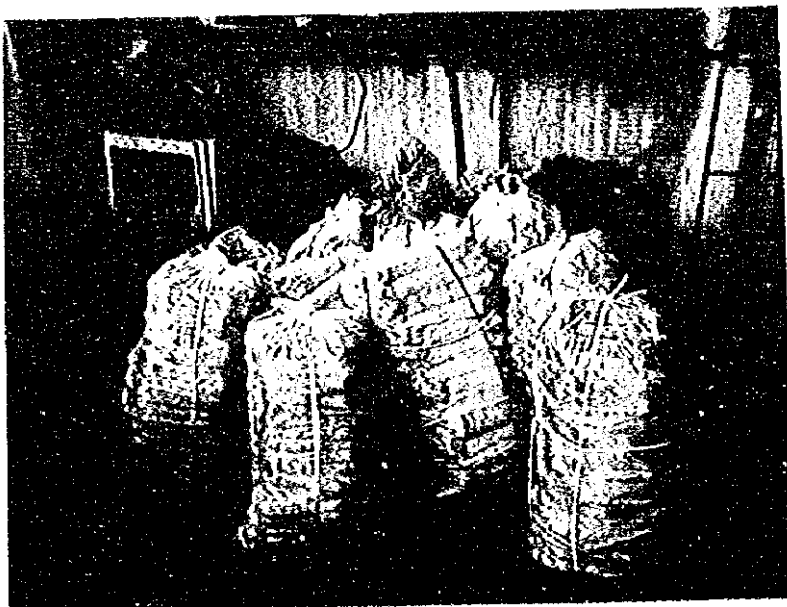
Menten Weir of
Sadang Irrigation Project
(South Sulawesi Province)



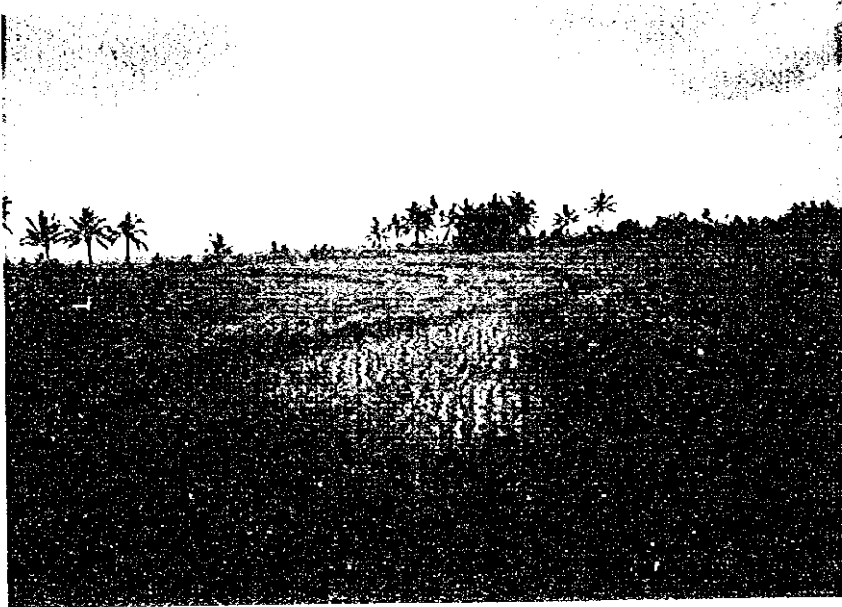
Vegetable growing farmers
in the Highland Area
(West Java Province)



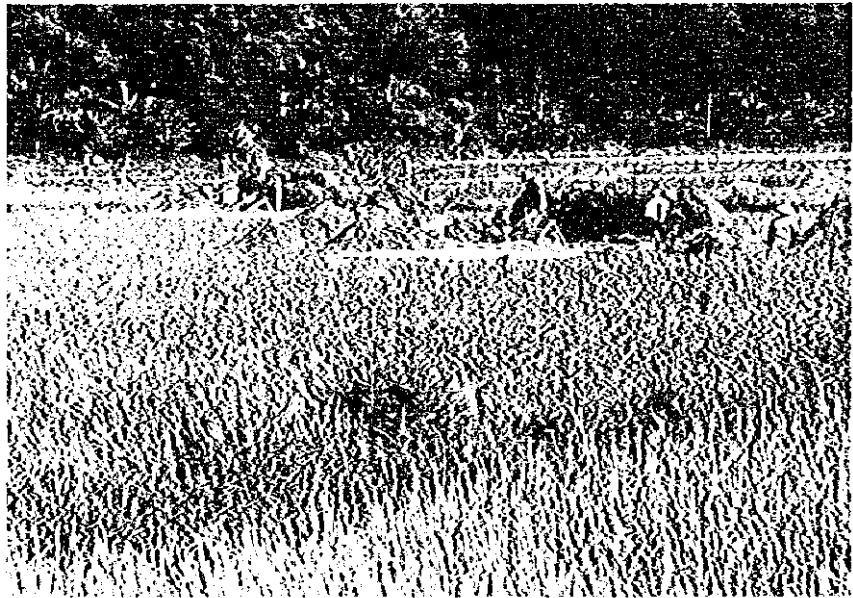
Cultivation of Vegetables, Paddy
and Banana in the Highland Area
(West Java Province)



Vegetables collected, washed,
and packed for shipping
(West Java Province)



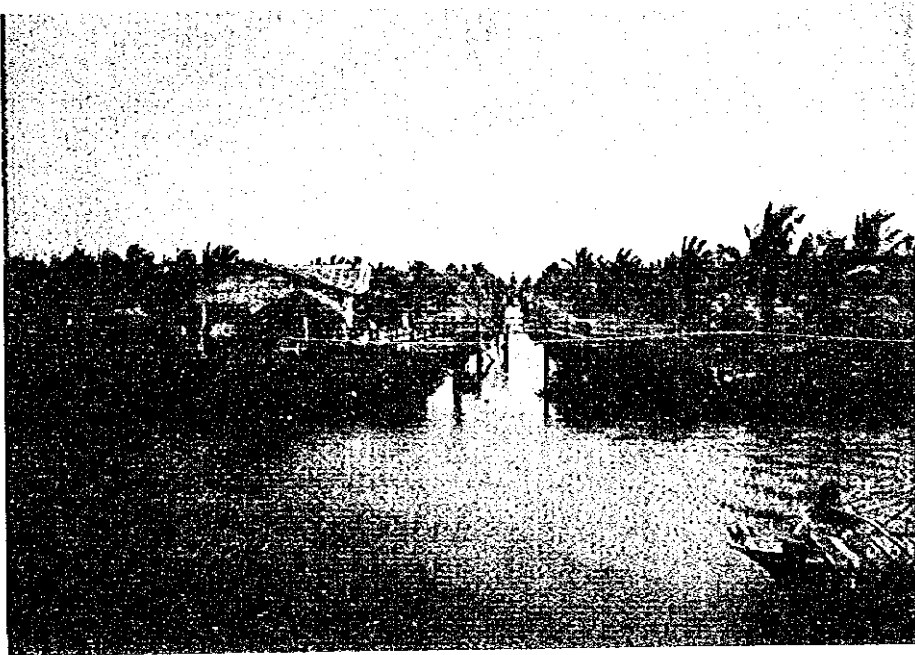
Rainfed Paddy Field
in the Lowland Area
(West Nusa Tenggara Province)



Threshing Work
in the Paddy Field
(West Nusa Tenggara Province)



Mixed Cultivation of
Banana, Cassava and Chili
(West Nusa Tenggara)



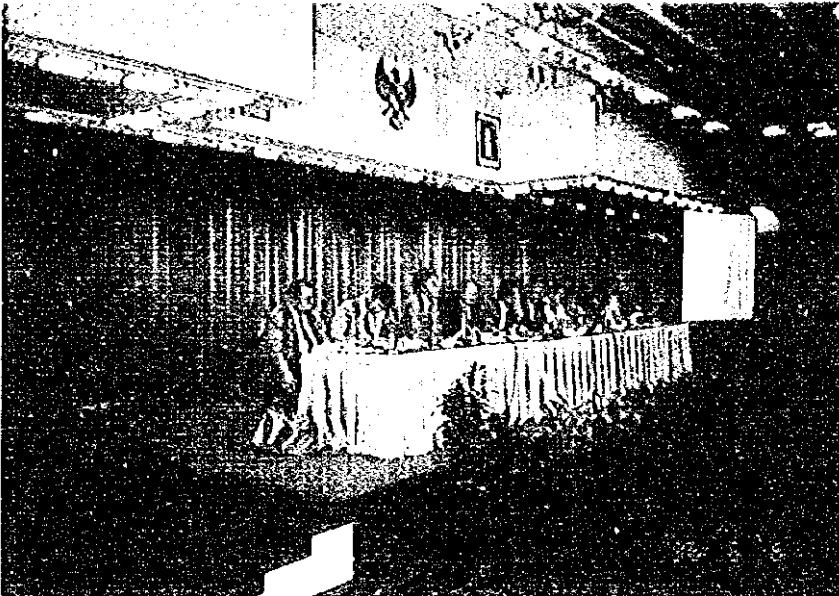
Main and Secondary Canals
in the Barito Kuala Area
(South Kalimantan Province)



Weeding Work
in a Swamp Paddy Field
(South Kalimantan Province)



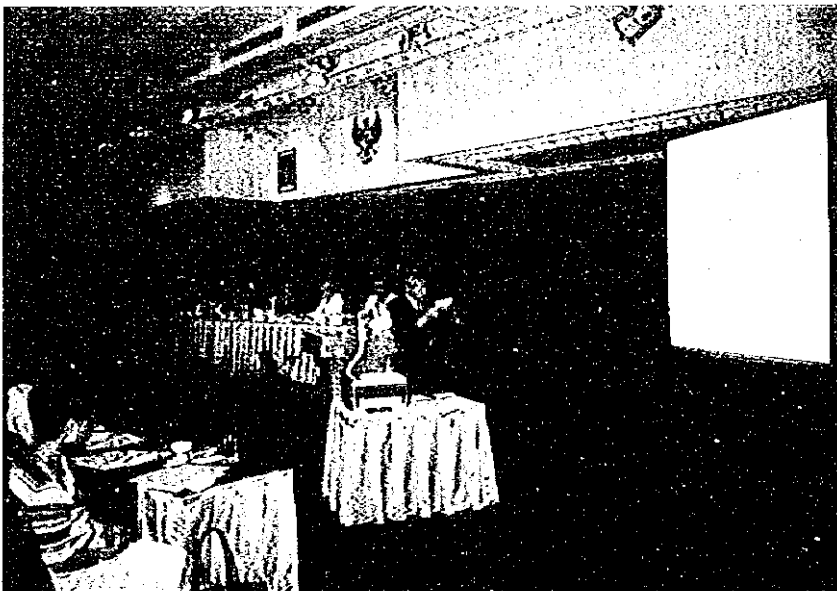
Root Rot Caused by
Iron Sulfate in the Soil
(South Kalimantan Province)



Workshop
on the Third Umbrella Cooperation
Opened at Jakarta on July 6, 1996



Around Hundred Officials
from Central and
Provincial Governments Gathered



Presentation
on the Results of the Study

SUMMARY

SUMMARY

1 INTRODUCTION

1.1 Background of the Study

The Japanese and Indonesian Governments have jointly initiated the Umbrella Cooperation for Integrated Agricultural and Rural Development (the first between 1981 and 1985, and the second between 1986 to 1990) aiming at the optimum results and efficiency in cooperation through a combination of available Japanese Official Development Assistance. These cooperation contributed to the self-sufficient and sustainable production of rice and increased production of other crops. The Indonesian Government officially requested the Government of Japan for the third Umbrella Cooperation (hereinafter referred to as the "Third Umbrella") in December 1992. Responding to the request, the Government of Japan sent Project Formation Missions to Indonesia in May/July 1994 and May 1995. These missions discussed the frameworks, implementation system, details of cooperation of the Third Umbrella. As a result of discussions, both governments exchanged the Minutes of Meeting (M/M) on the framework of the Third Umbrella on May 16, 1995. Following the Minutes, both governments exchanged the Record of Discussion (R/D) on the Third Umbrella in Indonesia on October 6, 1995. In the R/D, the purpose of the Third Umbrella was described as shown below;

Purpose of the Cooperation

1. The Japanese and Indonesian Governments will jointly initiate the Umbrella Cooperation for Integrated Agricultural and Rural Development aiming for optimum results and efficiency in cooperation through a combination of available Japanese Official Development Assistance schemes in technical and financial assistance, and in coordination with projects working towards the same goal and those currently being implemented by the Indonesian Government with or without foreign assistance.
2. The Umbrella Cooperation will be implemented with the purpose of improving the standard of living of farmers through three major objectives: improving farming productivity, efficiency and sustainability; increasing quantity and quality of farm production and diversification; and adding value to farm products. Thus, it will eventually contribute to the alleviation of rural poverty. Through this process, the

Third Umbrella Cooperation is expected to promote activities for building an integrated system and mechanism of agricultural development aimed at improvement in the living standard of farming communities, as a major goal of the Sixth Five-Year Development (REPELITA VI).

Eventhough, the R/D specified the frameworks of the Third Umbrella, the methodology of the prioritization for project to be implemented under the Third Umbrella within the next five years was not clarified.

Based on the conditions mentioned above, the Government of Indonesia officially requested the Japanese Government for the technical assistance to formulate a master plan for the Third Umbrella on October 20, 1995. In response to the request, the Government of Japan decided to conduct the Study on the Third Umbrella Cooperation for the Integrated Agricultural and Rural Development in Indonesia (hereinafter referred to as "the Study"). Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programs of the Japanese Government, undertook the Study in close cooperation with the Government of Indonesia. The preparatory mission was dispatched in December 1995 and the Scope of Works (hereinafter referred to as "S/W") for the Study was concluded on December 6, 1995 as attached in Annex A of this report. Based upon the S/W, JICA organized and dispatched the team to implement the Study (hereinafter referred to as the "Study Team"). The field survey was carried out in February and March, 1996 and the home office work was carried out in May, 1996. Based on the results of field survey and home office work, the Draft Final Report was prepared and submitted in the end of May, 1996 and explanation and discussion on the Draft Final Report was carried out at Jakarta in the first of June, 1996. The workshop for the Third Umbrella Cooperation was opened on June 6, 1996 and the results of the Study were reported at the workshop.

Based on the Draft Final Report and the comments of the Indonesian side, this report has been prepared by the Study Team as the Final Report of the Study.

1.2 Objectives of the Study

In order to improve the standard of living of farmers, the Third Umbrella Cooperation for Integrated Agriculture and Rural Development targets three major objectives, i.e. i)

improving farming productivity, efficiency and sustainability, ii) increasing quantity, and quality of farm production and diversification, and iii) adding value to farm products. The components of the study are specified as follows:

- 1) human resources and system of development of central and local government to improve planning and administrative capabilities
- 2) improvement of the capability in research to support development of appropriate production technologies
- 3) development of agriculture extension systems in order to improve farm management and to promote diversification in agricultural production
- 4) development of irrigation and drainage facilities and improvement of water resources management systems
- 5) development of a system for effective promotion of agricultural credit
- 6) development and strengthening of the activities farmers' organizations
- 7) development of post-harvesting activities including handling, processing and marketing of agricultural products to improve and add value to farm product
- 8) improvement of rural infrastructure

The Study aims i) to propose appropriate development direction after giving due consideration for present conditions of the above 8 components and actual needs of four model provinces (South Sulawesi, West Java, West Nusa Tenggara and South Kalimantan), and to prepare the integrated master plan of the Third Umbrella Cooperation after giving due consideration for projects' priorities in local and central government under the development direction mentioned above and to ii) to transfer the skill and knowledge applied for this Study, to the Indonesian counterpart personnel through on-the-job training during the course of the Study.

1.3 The Study Area

For the regional projects, the Study concentrates on areas with respect to each targeted agro-ecosystem in the following four provinces:

- | | |
|--------------------------------|------------------------|
| 1) South Sulawesi Province | Irrigated Area |
| 2) West Java Province | Highland Area |
| 3) West Nusa Tenggara Province | Lowland (Rainfed) Area |
| 4) South Kalimantan Province | Swamp Area |

In addition, the Study also includes related central government projects in the above mentioned four provinces.

2 DIRECTIONS OF AGRICULTURAL DEVELOPMENT IN THE MODEL AREA

2.1 Agro-ecosystem

Based on the objectives mentioned in R/D signed on October 6, 1995 and the results of field survey, the conception of agro-ecosystem was summarized as shown in Table 1.

2.2 Farm Household and Farmers' Intention Survey

In this study, "Farm Household and Farmers' Intention Survey" was conducted in order to comprehend economic conditions and intentions for development. In each province, a total of 800 farm households (20 farmers in each area, 10 areas in each province) were surveyed. The survey was conducted by questionnaire and the information collected forms into a part of the base-line data which can be compared with the data collected through future surveys. The contents of the questionnaire were prepared covering the 8 components set for this cooperation and reviewed by the Indonesian counterparts before the survey was conducted. Through the discussion between the study team and the provincial level officials of Government of Indonesia, 10 villages representing the model area were selected for the survey.

The survey is intended to collect base-line data which will be the basis for evaluation of this cooperation. For this purpose, contents of the questionnaire is designed to cover the following items which are either direct or indirect evaluation indicators:

- | | | |
|-------------------------------------|------------------------|-------------------------------------|
| 1) Family | 2) Living Condition | 3) Cultivating Land Area |
| 4) Cultivation, Yield and Marketing | 5) Infrastructure | 6) Agricultural Equipment and Tools |
| 7) Agricultural Facility | 8) Labor | 9) Income |
| 10) Expenditure | 11) Farmers' Intention | |

2.3 Constrains and Directions of Agricultural Development

Constrains and direction of the agricultural development in each model area are clarified through the Study as shown in Figures. 1 ~ 4.

Table 1 Concepts of Agro-ecosystem

South Sulawesi (Irrigated Area)	
Natural Conditions	This area is represented by flat land with abundant water resources of major river system. Average temperature is approximately 27°C and annual precipitation reaches to 2,800mm. Rainy season generally occurs between the months of March and May; however, this varies substantially for each area in the province.
Socio-economical Conditions	Agriculture is the major industry and 63% of the people are engaged in agricultural industry. This rate is the highest among the four provinces. For some agricultural produce, self sufficiency is achieved and surpluses are exported to other provinces.
Agricultural Conditions	Since the era of Dutch occupation, irrigation facility has been developed. The proportion of irrigated land is 80% for paddy field and double cropping of rice has been practiced by utilizing the abundant water resources. In this study, main stresses are put on the existing irrigation area.
West Java (Highland Area)	
Natural Conditions	Mountainous area in the tropical zone. In general, this area have elevation of 800 - 1500 m above sea level and have moderate climate throughout the year, Average temperature is approximately 20 °C and the lowest temperature is approximately 15 °C.
Socio-economical Conditions	Consumption centers are located within marketable distances. And the food demand have been increasing and diversifying along with economic development.
Agricultural Conditions	Taking advantage of its cool climate in tropical zone , horticultural crops and livestock introduced from temperate zone are produced to supply to the consumption centers.
West Nusa Tenggara (Low land [rainfed] Area)	
Natural Conditions	The area is located at low flat land area with an altitude of 50 ~ 500 m in the tropical zone. The annual rainfall is estimated as approximately 1,700 mm at the Lombok Island and 1,300 mm at the Sumbawa Island, and, about 85% of annual rainfall occurs in the rainy season (November ~ April)
Socio-economical Conditions	There is no main economical activity other than agriculture and 65% of labor forces is engaged in the agricultural sector. Most of all main trunk roads are paved, but the conditions of rural and farm roads are not improved.
Agricultural Conditions	Main crop is rice in rainy season and Palawija in dry season. Irrigation facilities are improved in more than 50% of agricultural lands, however, it is estimated that only 40% of that are irrigated in dry season.
South Kalimantan (Swamp Area)	
Natural Conditions	The area is under the direct effects of tide and tidal backwater. Its physiographic features are: - Low Land with elevation around 0 to 2 m. - Flat land which is scarcely undulating. - Peat soils developed in these area are mixed with sediments brought along river and water courses, Annual rainfall is about 2,200mm, mean temperature is 27°C.
Socio-economical Conditions	Agriculture is the most important sector, occupies 58% of the labor forces and 26% of GDP. The area has a relatively well maintained road net work except farm road, and transportation boats.
Agricultural Conditions	Rice is the major crop and paddy field occupies 69% of agricultural land in the study area. There are two cropping patterns for rice; single cropping using local varieties and double cropping using combination of local and improved varieties.

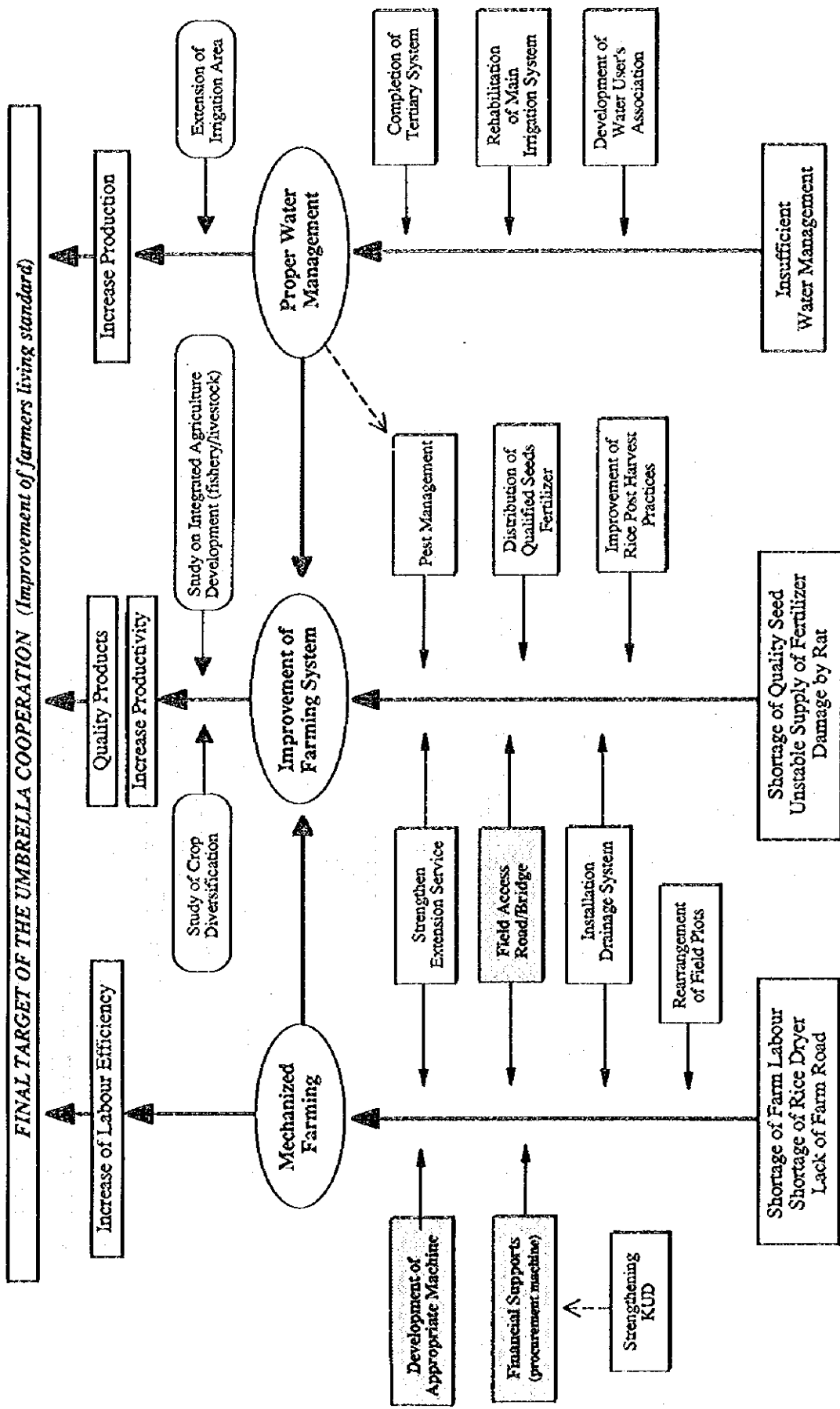


Fig. 1 Direction of Agricultural and Rural Development in South Sulawesi (Irrigated Area)

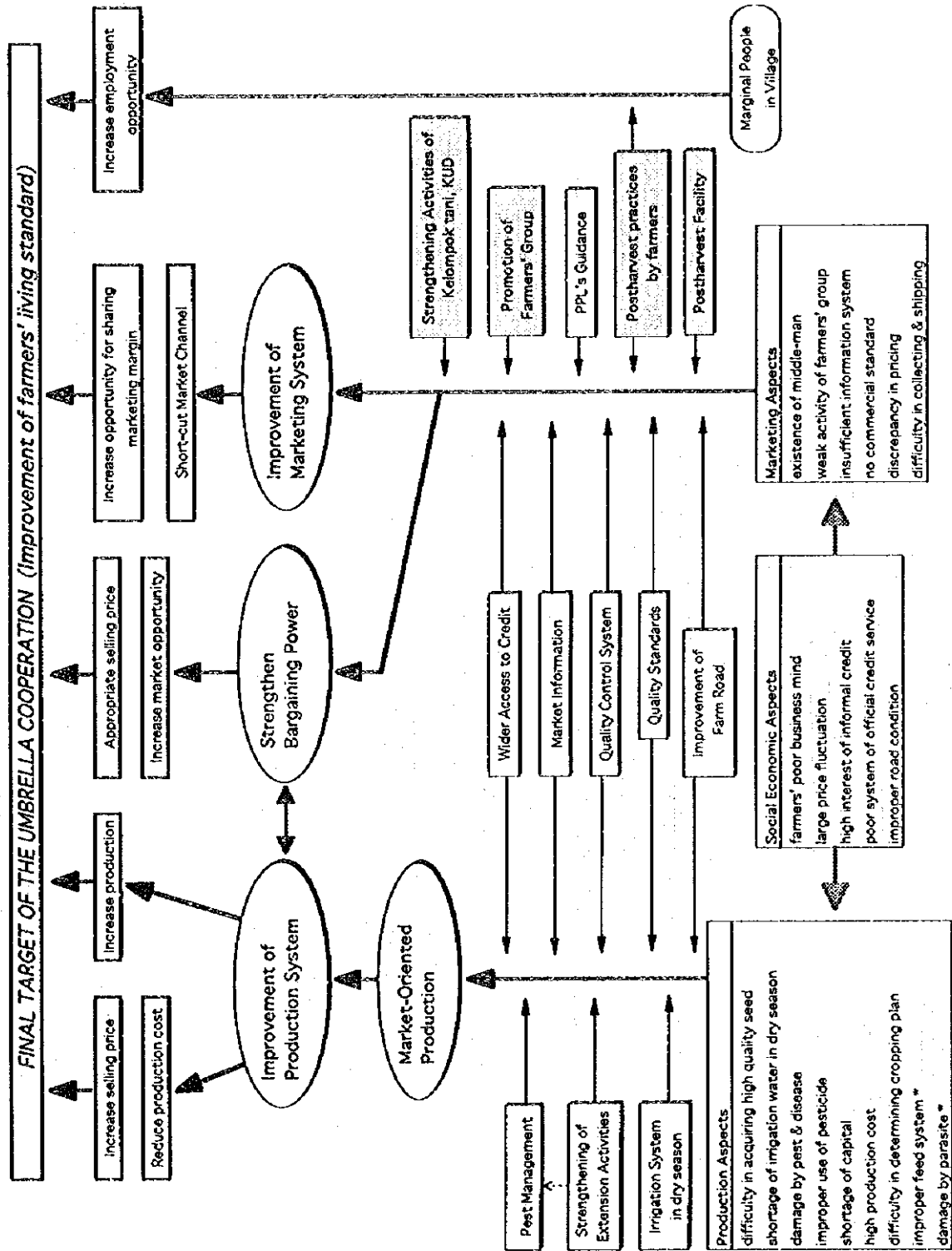


Fig. 2 Direction of Agricultural and Rural Development in West Java (Highland Area)

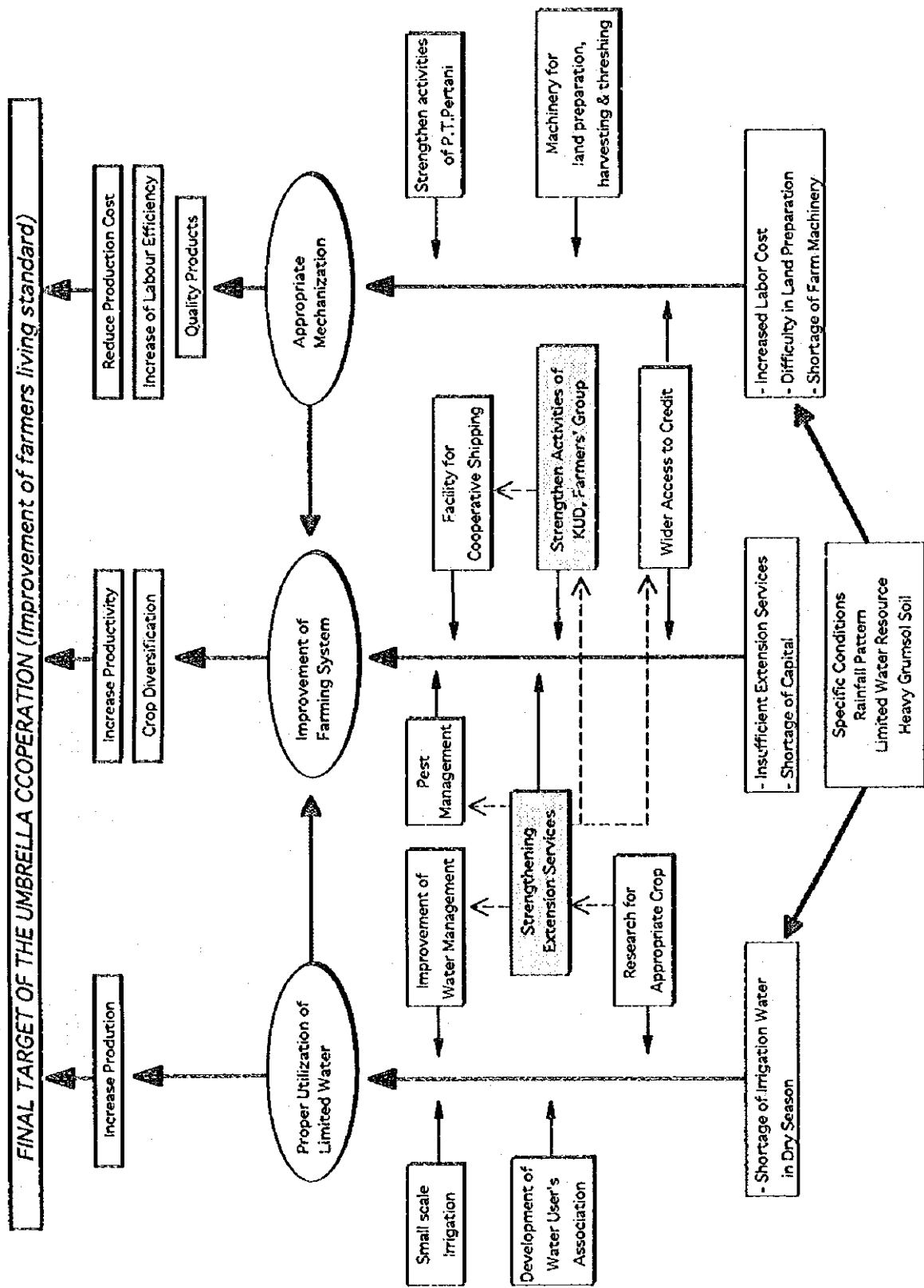


Fig. 3 Direction of Agricultural and Rural Development in West Nusa Tenggara (Lowland [Rain-fed] Area)

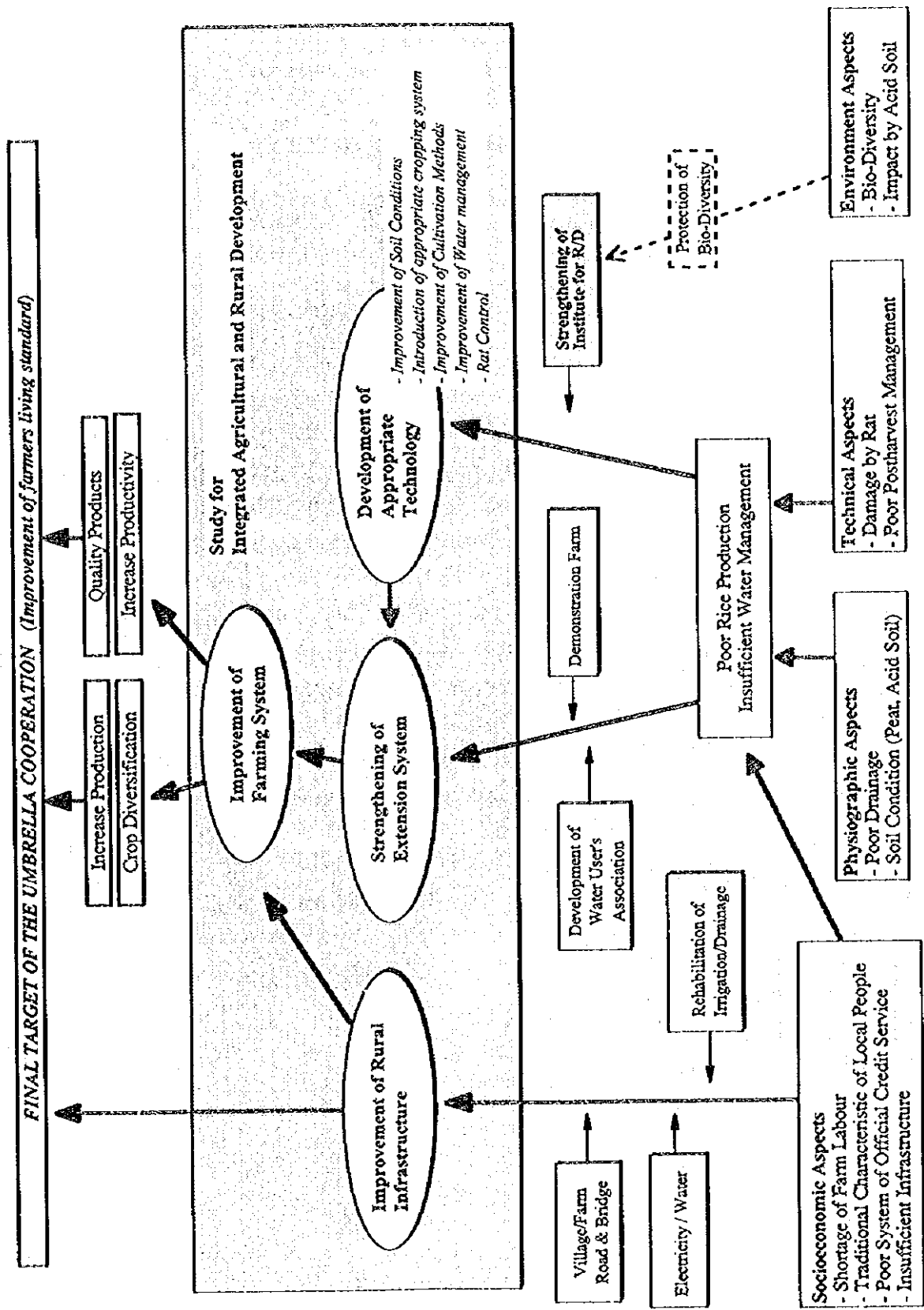


Fig. 4 Agricultural and Rural Development in South Kalimantan (Swamp Area)

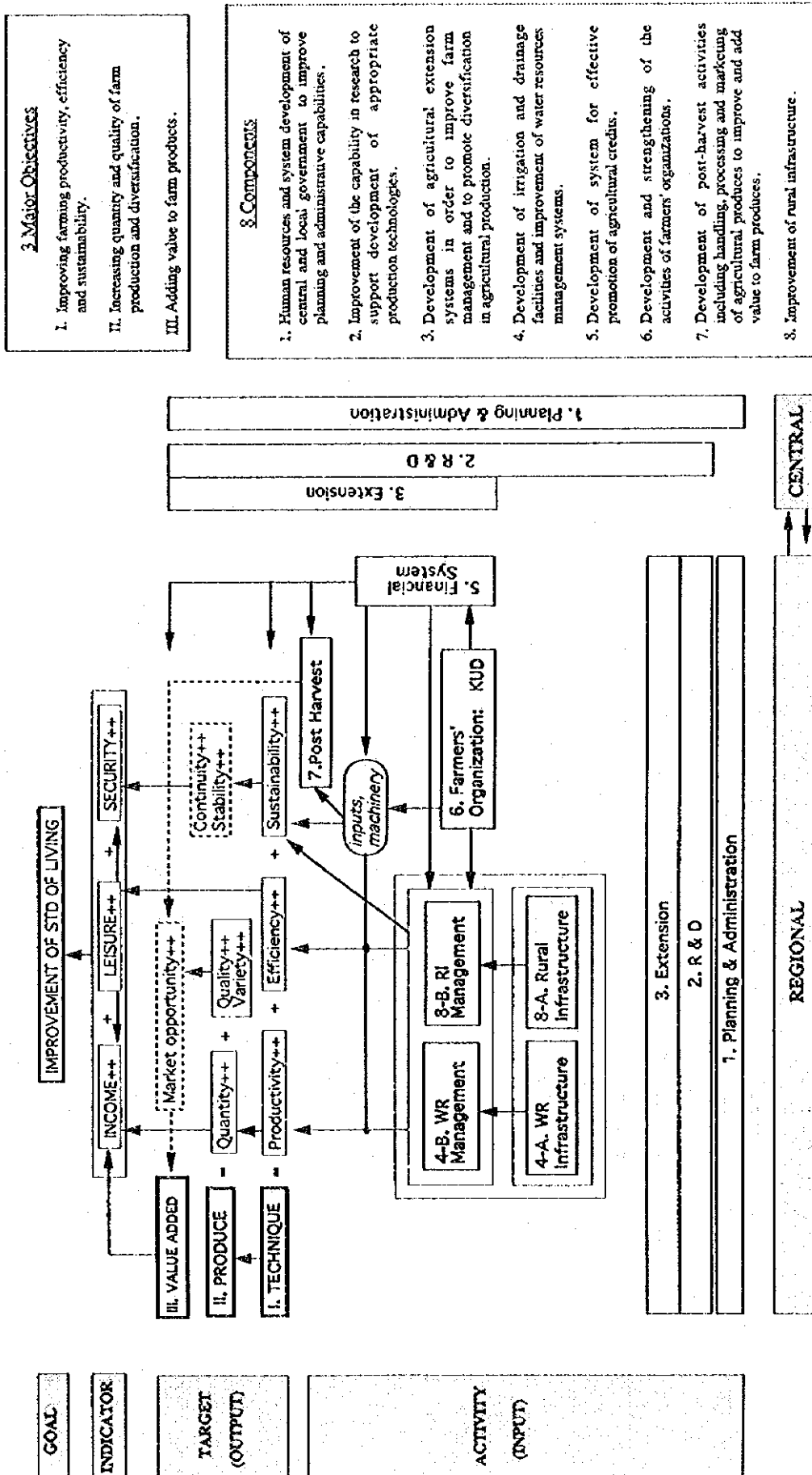
3 METHODOLOGY OF PRIORITIZATION FOR THE PROJECTS

3.1 The Projects for the Third Umbrella Cooperation

The projects for the Third Umbrella Cooperation are the integrated agricultural and rural development projects for four agro-ecosystems viz. irrigated area [South Sulawesi], highland area [West Java], lowland (rainfed) area [West Nusa Tenggara] and swamp area [South Kalimantan] as model areas of their field of activity. The implementation agencies of these projects are four ministries of the central government, which are the Ministry of Agriculture (the leading agency), the Ministry of Public Works, the Ministry of Cooperatives and Small Enterprises Development and the Ministry of Transmigration and Forest Squatters Resettlement; and respective provincial governments. They include the on-going projects, those under request, those yet to be registered, and new ones. They belong to either central or regional government's category, and comprise one or more components of eight activities defined by the R/D. Fig. 5 is a two dimensional expression of the above mentioned framework of the Umbrella Cooperation.

3.2 The Relationship among the Potential Projects and Synergism

The Umbrella Cooperation is expected to increase the degree of attainment toward the goal by integrating individual projects within the program. The basic concept of the relationship between the central projects and the regional projects is already illustrated in Fig. 5. Central activities mainly consist of the three components, namely planning and administration, R&D and extension. The activity of planning and administration covers not only the activities of other two central activities, namely, R&D and extension but also all the eight regional components and the three targets. The activity of R&D covers the five components of regional activities and the three targets, and the activity of extension covers the same area as that of R&D except the construction of infrastructure related to water resources, rural road, and rural water supply.



2. Major Objectives

1. Improving farming productivity, efficiency and sustainability.
- II. Increasing quantity and quality of farm production and diversification.
- III. Adding value to farm products.

3. Components

1. Human resources and system development of central and local government to improve planning and administrative capabilities.
2. Improvement of the capability in research to support development of appropriate production technologies.
3. Development of agricultural extension systems in order to improve farm management and to promote diversification in agricultural production.
4. Development of irrigation and drainage facilities and improvement of water resources management systems.
5. Development of system for effective promotion of agricultural credits.
6. Development and strengthening of the activities of farmers' organizations.
7. Development of post-harvest activities including handling, processing and marketing of agricultural produces to improve and add value to farm produces.
8. Improvement of rural infrastructure.

++ : Verifiable indicator
 WR : Water Resource
 RI : Rural Infrastructure

Fig. 5 AGRICULTURAL SECTOR: THE III UMBRELLA COOPERATION
 Basic Diagram for Orienting Projects in '1-3-8' Goal-Target-Activity Matrix

Synergism is a term used to define the phenomena in which the integrated effect of the combined plural elements is larger than the arithmetic sum of the effect of the single element. In the field of material science, synergism may be expected by combining different kind of materials which have different mechanism with each other. In the field of ecology, synergism is to denote the phenomena in which an organism shows various positive physiological changes when another organism exists close by. Some of the synergism which can be expected from the integration of individual potential projects are increase of positive external effects, decrease of negative external effects as well as increase of positive internal effects. Gross effect of synergism may be estimated quantitatively in the field of ecology but quite different from its net effect, as synergism is inevitably accompanied by antagonism.

3.3 Proposition of Prioritization of the Projects

The projects for the Umbrella Cooperation can be divided into two categories, namely category 1 which include the projects being implemented or approved to be implemented, and category 2 which include the projects newly proposed projects (under application or under discussion). The projects in category 1 are excluded for prioritization in this Study. Those in the category 2 are classified into three priority groups namely (A), (B) and (C) (see Table 4.3.1) according to the priority given by the study for each agro-ecosystem. Prioritization of the potential projects which will newly be submitted after the completion of this study ought to be judged by the procedure proposed in this study.

Though all the eight components of the activity are equally important in the framework of the Umbrella Cooperation, the difference in the present development stage among the four agro-ecosystems results in the difference in the degree of urgency of some components over others in terms of attainment of the goal. A four step procedure for classification of the new potential projects is proposed. In this procedure, the different degrees of emphasis has been taken into account in development strategy in each agro-ecosystem which has been identified by the field survey conducted by the study team. Explanation of the procedure is described below:

Step 1: Identification of priority components of activity

The priority components of activity are identified according to the degree of emphasis in development strategy in the each agro-ecosystem. Although all the

eight components are important for the integrated rural development, emphasis is placed on some of the specific components according to the present development stage and conditions in each model area. Based on the results of the field survey, the important components and the most important components, which are considered as the most urgently required measures to be taken, for each model area are selected as shown in Table 3.

Step 2: Formation of ['1-3-8' Goal-Target-Activity Matrix]

All the important components and the most important components of each agro-ecosystem are placed in the ['1-3-8' Goal-Target-Activity Matrix] (Fig. 5). Four diagrams of Fig. 6 are prepared as the results of this step. These relative importance among the components are based on the present status of the urgently required measures in each agro-ecosystem. They need to be revised in future according to the progress of the development or other external conditions.

Step 3: Confirmation of major activities of all the projects

After executing the close examination of the objectives and expected contents of activities of a project, its component(s) of activity are determined. If the project has multiple objectives, it has plural components. Though its fields of activity are limited to three components (components 1, 2, & 3), a central project is judged by its relationship with the components of the specific agro-ecosystem at which its activity is aimed.

Step 4: Prioritization of the potential projects

A project whose field of activity is fitted in one of the most important components is classified as "Priority A". A project whose field of activity is fitted in one of the important components is classified as "Priority B". A project whose field of activity is not fitted in either the most important component or the important components is classified as "Priority C".

The results obtained through the above mentioned procedure are given in Appendix M. A sample of examination sheet, one each from the central projects and regional projects are shown below.

Central Project

Name: Project Sample 1
 Level: Central
 Related Region: South Sulawesi, West Java
 Major objective: Technical trial study of horticultural crop
 Major activities: R&D of post-harvest processing technology
 (R&D is component 2)
 (the study object is component 7)
 (relationship with regional component)
 (component 7 of West Java is one of the most important components, so the project is classified as priority A)

Relation between Central and Regional

S.Sulawesi	W.Jawa	N.T.B	S.Kalimantan

Components

1	2	3	4	5	6	7	8

S.Sulawesi

1	2	3	4	5	6	7	8

W.Jawa

1	2	3	4	5	6	7	8

N.T.B

1	2	3	4	5	6	7	8

S.Kalimantan

1	2	3	4	5	6	7	8

Priority

(A)	B	C
-----	---	---

Regional Project

Name: Project Sample 2
 Level: Regional
 Related Region: South Sulawesi
 Major objective: upgrading of regional infrastructure
 Major activities: improvement of farm road
 (regional component 8)
 (component 8 of South Sulawesi is one of the most important component)

Components

1	2	3	4	5	6	7	8

S.Sulawesi

1	2	3	4	5	6	7	8

W.Jawa

1	2	3	4	5	6	7	8

N.T.B

1	2	3	4	5	6	7	8

S.Kalimantan

1	2	3	4	5	6	7	8

Priority

(A)	B	C
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Table 2 Classification of the Projects

Category	Prioritization
1. under implementation or to be implemented	-
2. newly proposed (under application or under examination)	(A) Projects whose objectives coincide with the most important components related to the model area (B) Projects whose objectives coincide with the important components related to the model area (C) Projects whose objectives do not coincide with most important and/or important components related to the model area

Table 3 The Important and Most Important Components

Agro ecosystem	Important components	Most important components	Reasons for selection of most important components
Irrigated Area (South Sulawesi)	3: Extension (regional) 4A: W.R. infrastructure 4B: W.R. management 6: Farmers' organization	8A: Rural infrastructure Input, machinery	to solve the labour shortage problem by improving the efficiency of farming
Highland Area (West Java)	2: R&D (central, regional) 3: Extension (regional) 4A: W.R infrastructure 8A: Rural infrastructure	6: Farmers' organization 7: Postharvest	to establish a market-oriented farming system
Lowland Area (West Nusa Tenggara)	2: R&D (central, regional) 4A: W.R. infrastructure 4B: W.R management 5: Agricultural finance	3: Extension (regional) 6: Farmers' organization	to introduce and disseminate a new farming technology suitable for rain-fed farming
Swamp Area (South Kalimantan)	1: Planning & admi. 3: Extension (central & regional) 8A: Rural infrastructure	2: R&D (central, regional)	to establish and verify a development strategy for swamp areas

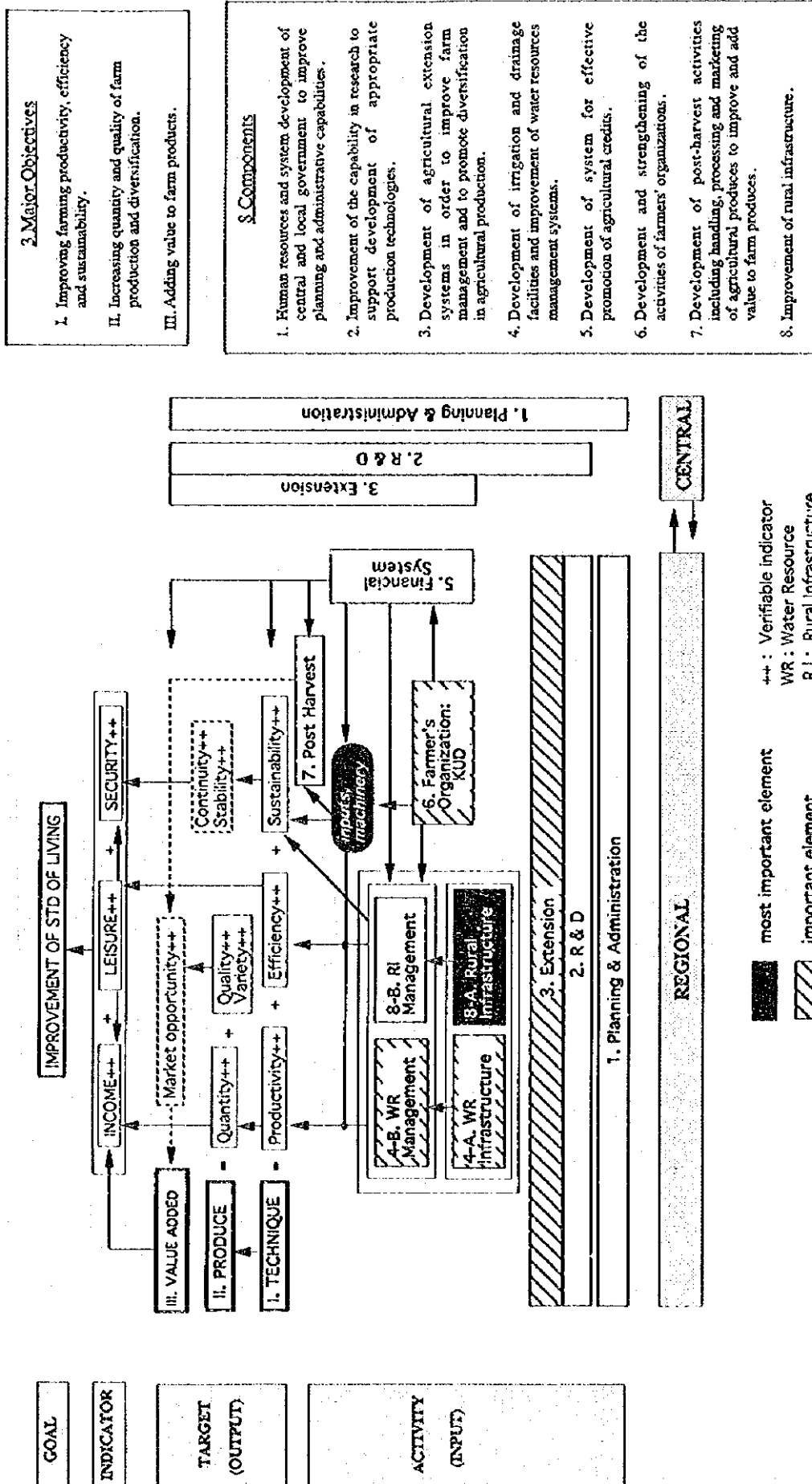


Fig. 6 AGRICULTURAL SECTOR: THE III UMBRELLA COOPERATION
 (1/4) Basic Diagram for Orienting Projects in '1-3-8' Goal-Target-Activity Matrix
 for South Sulawesi Province (Irrigated Area)

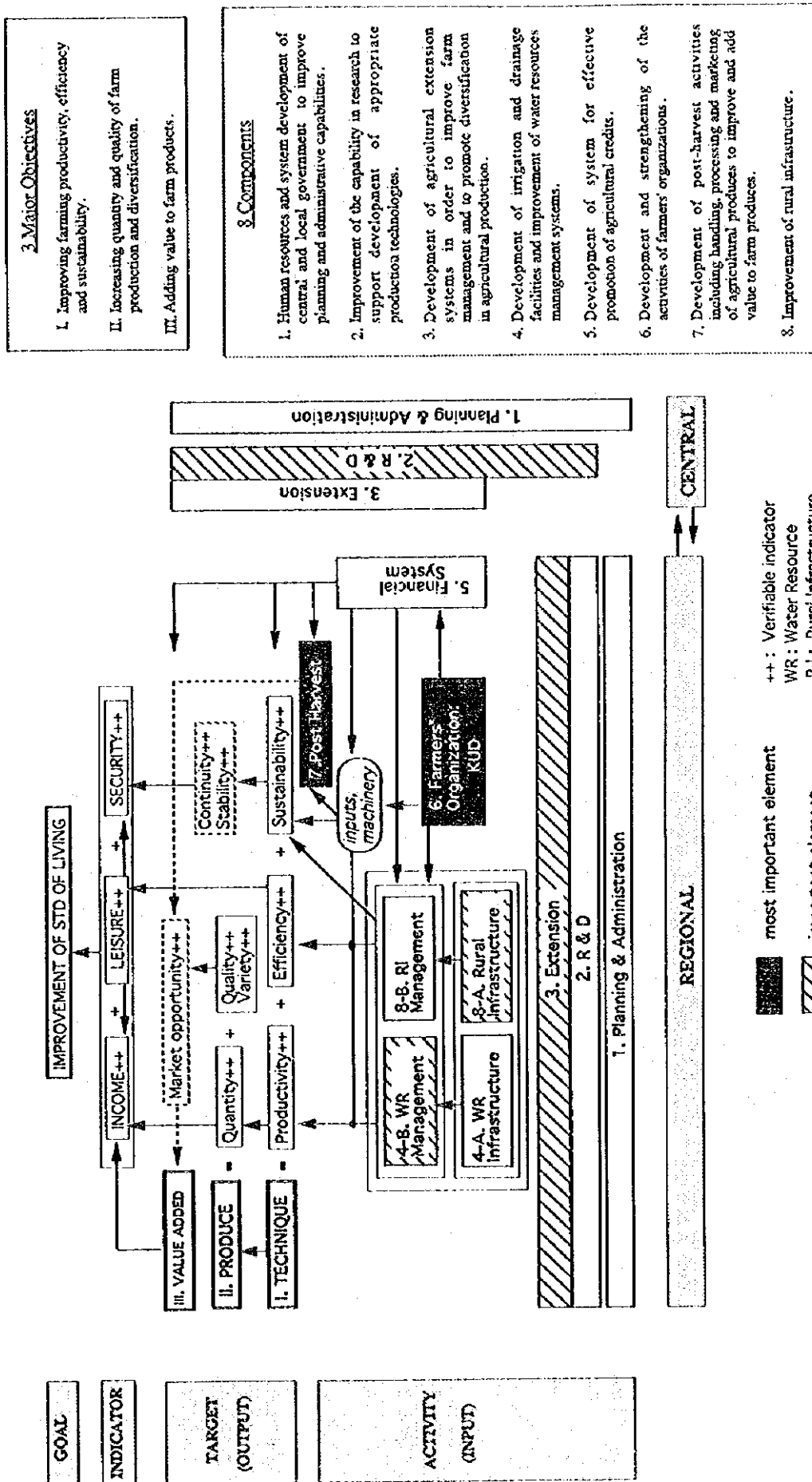


Fig. 6 AGRICULTURAL SECTOR: THE III UMBRELLA COOPERATION
 (2/4) Basic Diagram for Orienting Projects in '1-3-8' Goal-Target-Activity Matrix
 for West Java Province (Highland Area)

- 2. Major Objectives**
- I. Improving farming productivity, efficiency and sustainability.
 - II. Increasing quantity and quality of farm production and diversification.
 - III. Adding value to farm products.
- 3. Components**
1. Human resources and system development of central and local government to improve planning and administrative capabilities.
 2. Improvement of the capability in research to support development of appropriate production technologies.
 3. Development of agricultural extension systems in order to improve farm management and to promote diversification in agricultural production.
 4. Development of irrigation and drainage facilities and improvement of water resources management systems.
 5. Development of system for effective promotion of agricultural credits.
 6. Development and strengthening of the activities of farmers' organizations.
 7. Development of post-harvest activities including handling, processing and marketing of agricultural produces to improve and add value to farm produces.
 8. Improvement of rural infrastructure.

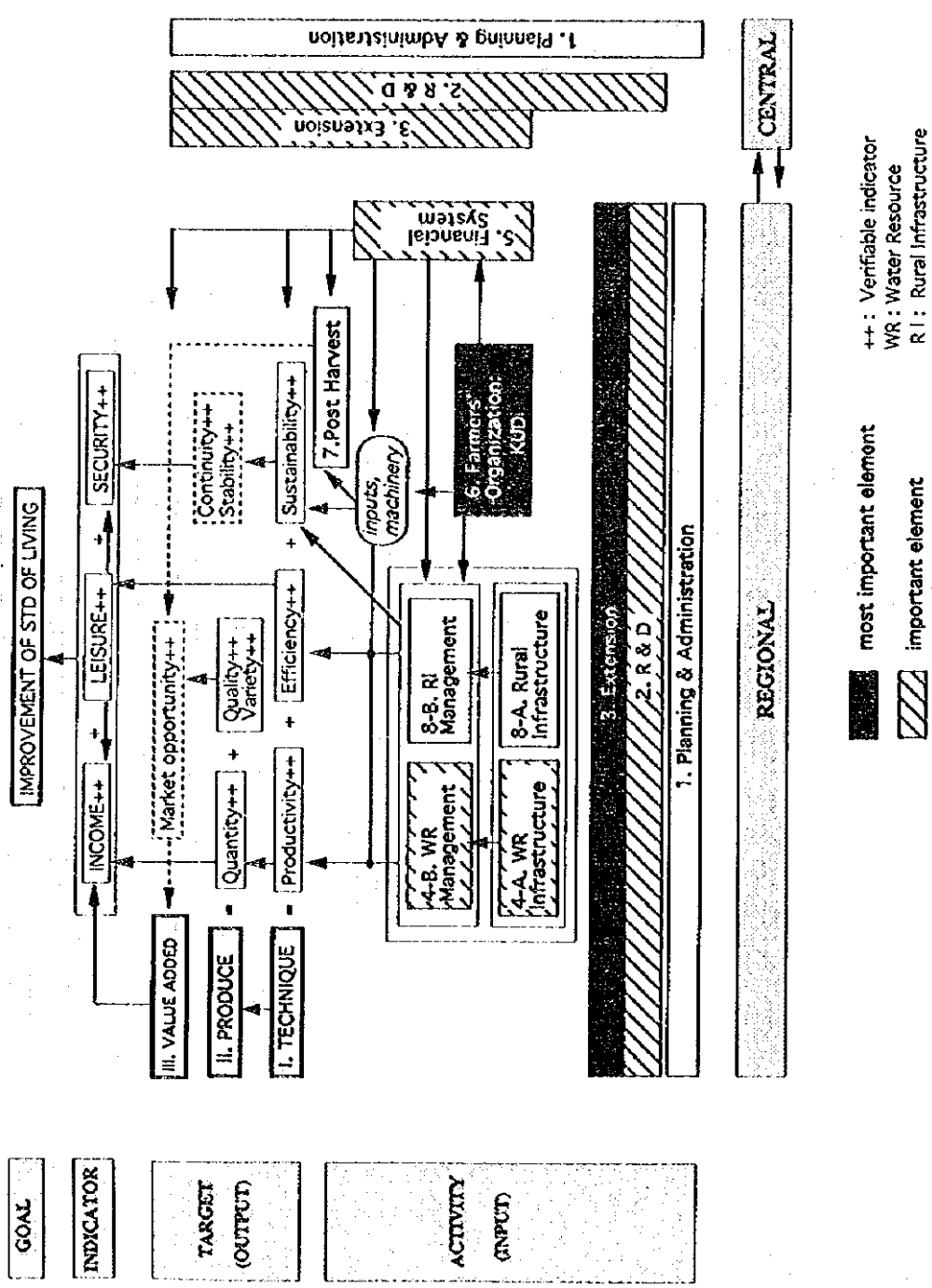
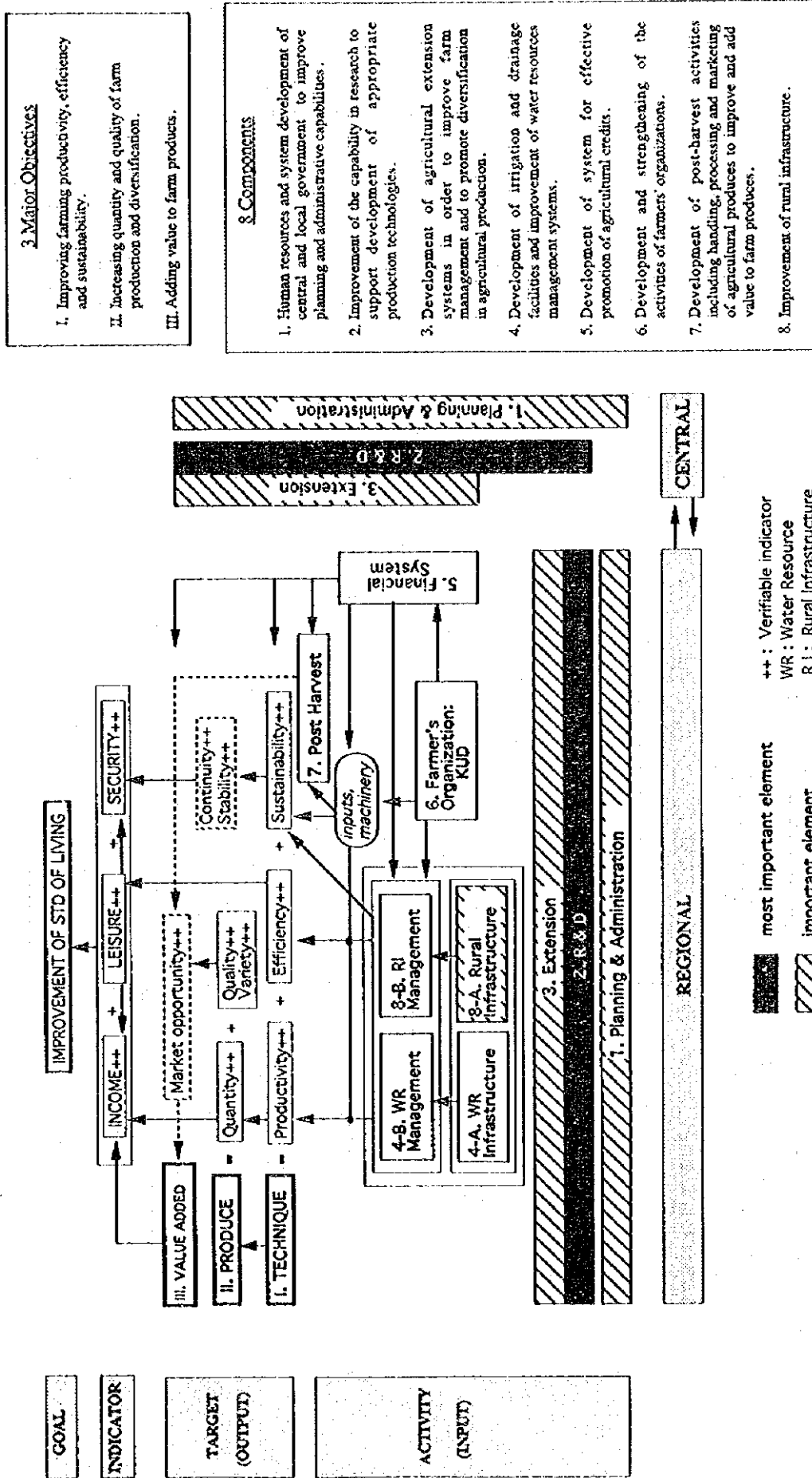


Fig. 6 AGRICULTURAL SECTOR: THE III UMBRELLA COOPERATION
 (3/4) Basic Diagram for Orienting Projects in '1-3-8' Goal-Target-Activity Matrix
 for West Nusa Tenggara Province (Lowland(Rain-fed) Area)



- 3 Major Objectives**
- I. Improving farming productivity, efficiency and sustainability.
 - II. Increasing quantity and quality of farm production and diversification.
 - III. Adding value to farm products.

- 8 Components**
1. Human resources and system development of central and local government to improve planning and administrative capabilities.
 2. Improvement of the capability in research to support development of appropriate production technologies.
 3. Development of agricultural extension systems in order to improve farm management and to promote diversification in agricultural production.
 4. Development of irrigation and drainage facilities and improvement of water resources management systems.
 5. Development of system for effective promotion of agricultural credits.
 6. Development and strengthening of the activities of farmers' organizations.
 7. Development of post-harvest activities including handling, processing and marketing of agricultural produces to improve and add value to farm produces.
 8. Improvement of rural infrastructure.

Fig. 6 AGRICULTURAL SECTOR: THE III UMBRELLA COOPERATION
 (4/4) Basic Diagram for Orienting Projects in '1-3-8' Goal-Target-Activity Matrix for South Kalimantan Province (Swamp Area)

4 STUDY OF PROJECTS FOR THE THIRD UMBRELLA COOPERATION

4.1 Prioritization of Projects

On-going projects, which are under the implementation or approved for implementation at the end of April, 1996 and are considered as the projects in the category mentioned in the section 3.1, are selected based on the following projects.

- Projects by ODA of Japan as mentioned in the Minutes of Meeting on Record of Discussion on the Third Umbrella Cooperation
- Projects which are executed by bilateral and multilateral assistance
- Projects noted in "Development Co-operation INDONESIA, 1994 Report" by UNDP
- Projects which are executed by Central and/or Provincial Government of Indonesia
- Projects approved for implementation but not yet executed

The newly proposed projects were selected from the following projects.

- Projects requested by MOA, MOPW, MOCSED, MOTFSR and four provincial governments concerned in the program of Third Umbrella Cooperation (the projects requested after May, 1996 are excluded)
- Projects in relation with the Program of Third Umbrella Cooperation as noted in blue-book by BAPPENAS
- Projects having higher priority in addition to the on-going projects that are considered
- Projects newly proposed by the Study Team

Based on the prioritization method suggested, there are 30 central projects and 56 regional projects. Some of the regional projects are covering two or more provinces. The breakdown of numbers of the projects is summarized below.

	No. of projects	Priority A	Priority B	Priority C
Total No.	86	47	34	5
Central	30	19	10	1
Regional	56	28	24	4
Irrigated area (S.S)	22	13	7	2
Highland area (W.J)	23	14	8	1
Lowland area (NTB)	21	9	11	1
Swamp area (S.K)	18	10	8	0

4.2 Recommendation of the High Priority Projects

Based on the study of prioritization, the projects in the priority group "A" are recommended as high priority projects for necessity and urgency of action in the Program of the Third Umbrella Cooperation. The priority "A" projects include those need to be assisted not only by the Government of Japan but also other donors/agencies and the Government of Indonesia. However, each project of the priority "A" is not committed by every donor/agency including Government of Indonesia, thus the implementation of each project should be arranged and confirmed through usual procedures by concerned officials.

4.3 Recommendation for Implementation Schedule of the Program

Based on the results of the prioritization study of each project, implementation schedule for the priority "A" projects was recommended in consideration of urgency of individual projects, maximizing the interrelation and synergistic effects among projects. This implementation schedule has been planned considering only time and duration of projects and their financial resources, hence a more detailed review is required to include budgeting aspects.

5 MONITORING AND EVALUATION OF THE THIRD UMBRELLA COOPERATION

5.1 Introduction

For the Umbrella Cooperation which consists of about a hundred individual projects with different nature and quality, a comprehensive method of monitoring and evaluation ought

to be introduced. The method of monitoring and evaluation ought to be reasonable in terms of time and economy.

5.2 The Method of Monitoring and Evaluation

Monitoring is to be carried out on the umbrella cooperation which consists of about a hundred individual projects with quite different quality in terms of scale, type, period of implementation etc. It is indeed impossible for a monitoring staff to collect information regarding some hundreds of individual projects of the umbrella cooperation by himself/herself. A reasonable alternative for the monitoring staff of the umbrella cooperation is to get information about the individual projects from monitoring staff of the respective executing agencies in order to grasp the overall flow of the umbrella cooperation program. As a rule of thumb, conduct monitoring as simple as possible for the routine checking of an individual project, but once any phenomenon that foreshadows a problem is detected, then scrutinize that project for any sign of waywardness.

Considering its purpose of grasping the overall trends of the umbrella cooperation which consists of many individual projects of different characteristics, monitoring had better be carried out by using as many common items as possible, which requires lot of time and resources. On the other hand, if accuracy of information is taken into account, contents of items had better be generalized and its number had better be reduced as less as possible. To sum up, required characteristics of monitoring are (1) easy to understand, (2) less number of items, (3) easy to process, and (4) sufficient enough to follow the trend of overall umbrella cooperation. Therefore a two step procedure of monitoring is proposed as a realistic and feasible solution.

The first step: items to be monitored under normal conditions are the original budget and the actual expenditure of all the projects that are under the umbrella cooperation.

The second step: when unusual disparity is found between the budget and expenditure, detailed information on the concerned project is to be collected, its cause is to be examined, and its impact to be assessed.

In the second step, number of items to be examined changes according to the characteristics of the individual project concerned.

Flow of the monitoring procedure is summarized as shown in Fig. 7.

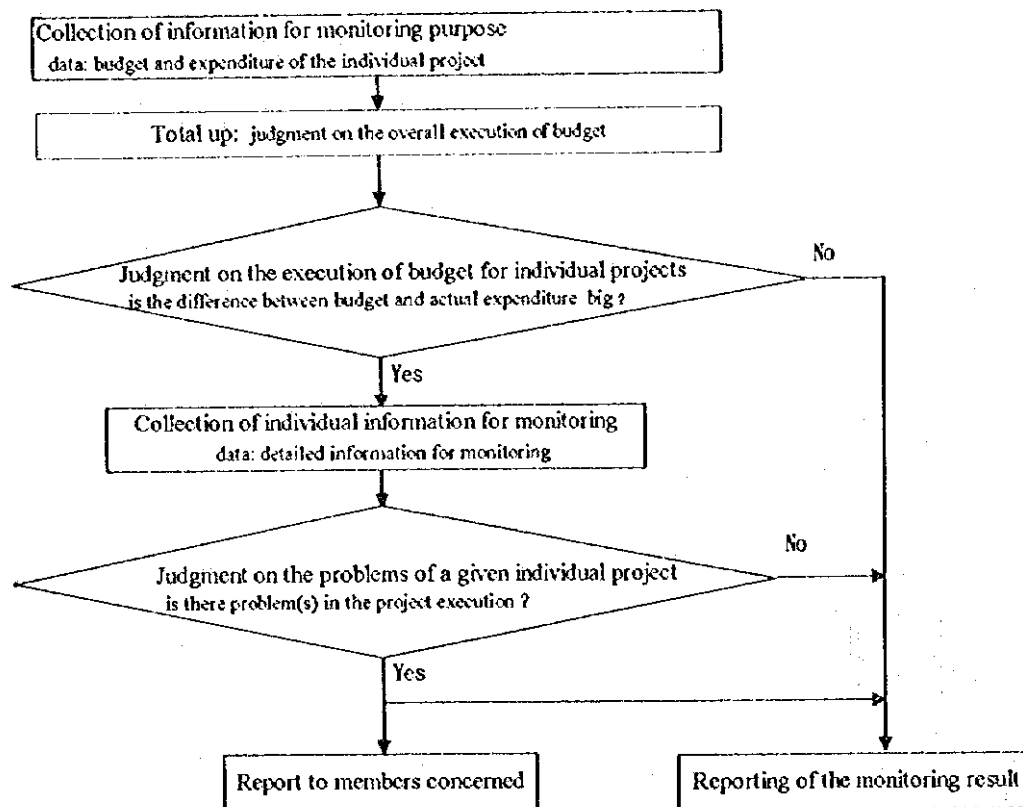


Fig. 7 Monitoring Procedure for the Third Umbrella Cooperation

Evaluation of the overall umbrella cooperation will be carried out three times during the lifetime of the Third Umbrella Cooperation, namely, at the mid-term of implementation period, after the implementation period, and sometime in the post-project period so that the effect of the Third Umbrella Cooperation can be assessed and judged at each stage. It is also important to identify the problems which the umbrella cooperation faces, and to give guidance to the planning and the system of operation of the umbrella cooperation.

In this study, a method is proposed to evaluate the improvement of farmers' living standard, based on the hypothesis written below, relied on the information collected by a farm survey conducted by this study team, and analyzing the change of indicators which are direct abstraction from three targets, namely, (1) improvement of agricultural techniques (productivity, efficiency, and sustainability), (2) improvement of produce (quantity, quality, and variety), and (3) increase of value-added.

- **A working hypothesis;**
"There may be a difference in , for example, an increase rate of net agricultural income after the end of the life of the umbrella cooperation between a group incorporated with it and another group without it"

Each evaluation at the mid-term, after the implementation period, and in the post-project period will have to give due considerations to the specific aspects of the study. Probable items need to be checked are mentioned below.

- **Mid-term evaluation**
confirmation of baseline data (necessity of improving the questionnaire)
necessity of increasing the number of samples
practicability of evaluation procedure
consistency with information collected by monitoring (necessity of improving monitoring procedure and system)
- **Evaluation at the end of implementation**
confirmation of baseline data (necessity of improving the questionnaire)
necessity of extending the duration of monitoring
a proposal for the timetable of a post-project evaluation
- **Post-project evaluation**
a proposal for the improvement of the planning and the system operation of the umbrella cooperation
final assessment on the effect of the Third Umbrella Cooperation

Evaluation of the integrated effect of the Third Umbrella Cooperation projects on the pre-set goal of "improvement of farmers' living standard" can be done by comparing the target and non target component projects with the following indicators:

- I. indicators related to income**
- II. indicators related to leisure**
- III. indicators related to security**

The information collected through the farm survey of this study team forms the basic

socio-economic data of the target areas on which efforts of the Umbrella Cooperation are focused. It is feasible to pick up a target group incorporated with the umbrella cooperation and another group for comparison within these data, and make them serve as a baseline data to assess the integrated effect of the umbrella cooperation which also includes synergistic effect. Theoretically, the overall effect of the Umbrella Cooperation on the set goal can be estimated by comparing the difference of indicators between the two groups at a certain time span, namely between the baseline study and the evaluation studies which will be carried out at the prescribed interval. However, comparison will require careful scrutiny because obviously both groups have always been influenced by other socio-economic elements than the umbrella cooperation and there is always possibility of exchange of information between the two. Evaluation will be carried out at the mid-term, at the end of the implementation of the umbrella cooperation, and in the post-project period. Its procedure is shown in Fig. 8. It is appropriate to conduct evaluation by an expert study team.

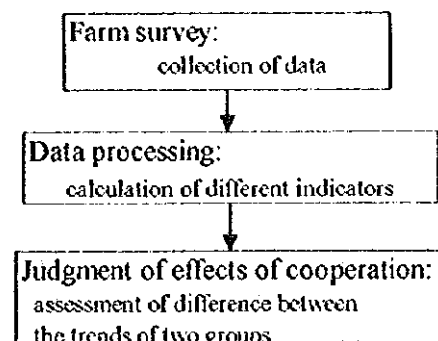


Fig. 8 Evaluation procedure for the overall umbrella cooperation

5.3 System and Schedule of Implementation

As shown in Fig. 9, a monitoring section is set up in the secretariat of the umbrella cooperation. And monitoring is to be carried out with the support of the four executing ministries and the four concerned regional governments.

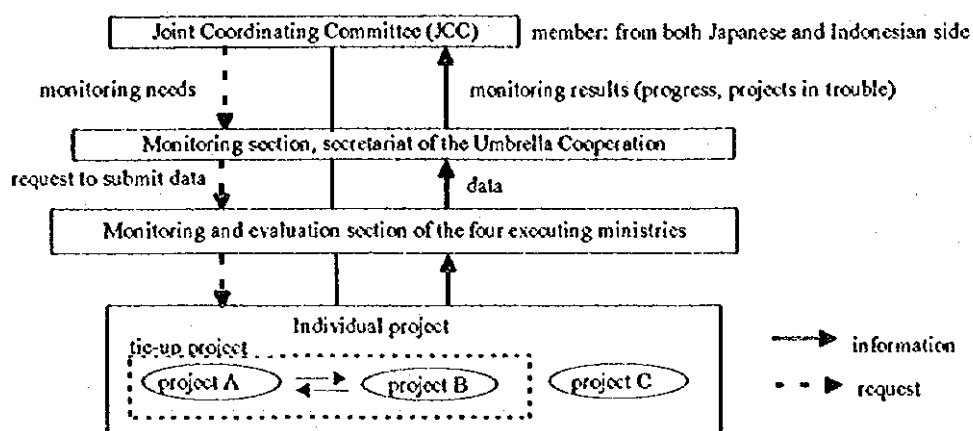


Fig. 9 System of Monitoring

Monitored information of the individual projects will be collected by the concerned ministries, translated in English, and submitted to the secretariat of the umbrella cooperation. Thus the positive function of supporting arrangement on the part of the four executing ministries is indispensable. Monitoring will be carried out once in every six months. If any anomaly is detected, procedure of step 2 will further be carried out.

An evaluation team will be dispatched at mid-term, at the end of implementation of the umbrella cooperation, and in the post-project period. The secretariat of the umbrella cooperation will coordinate the evaluation with the support of the four executing ministries and the four concerned regional governments. The system is shown in Fig. 10.

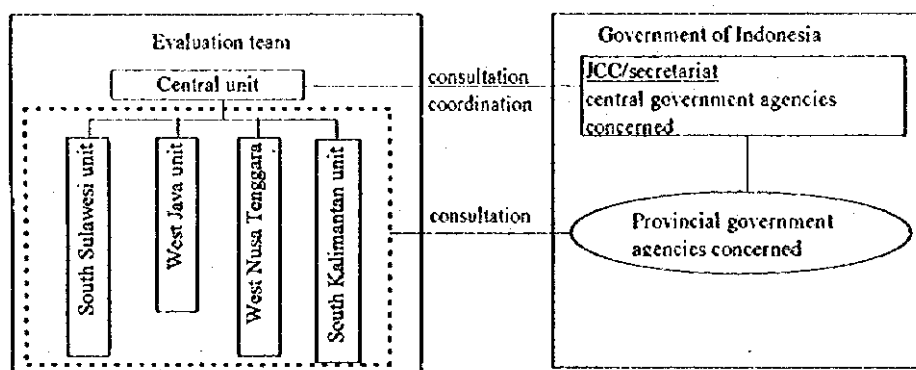


Fig. 10 System of Evaluation

Proposed schedule of evaluation is as follows.

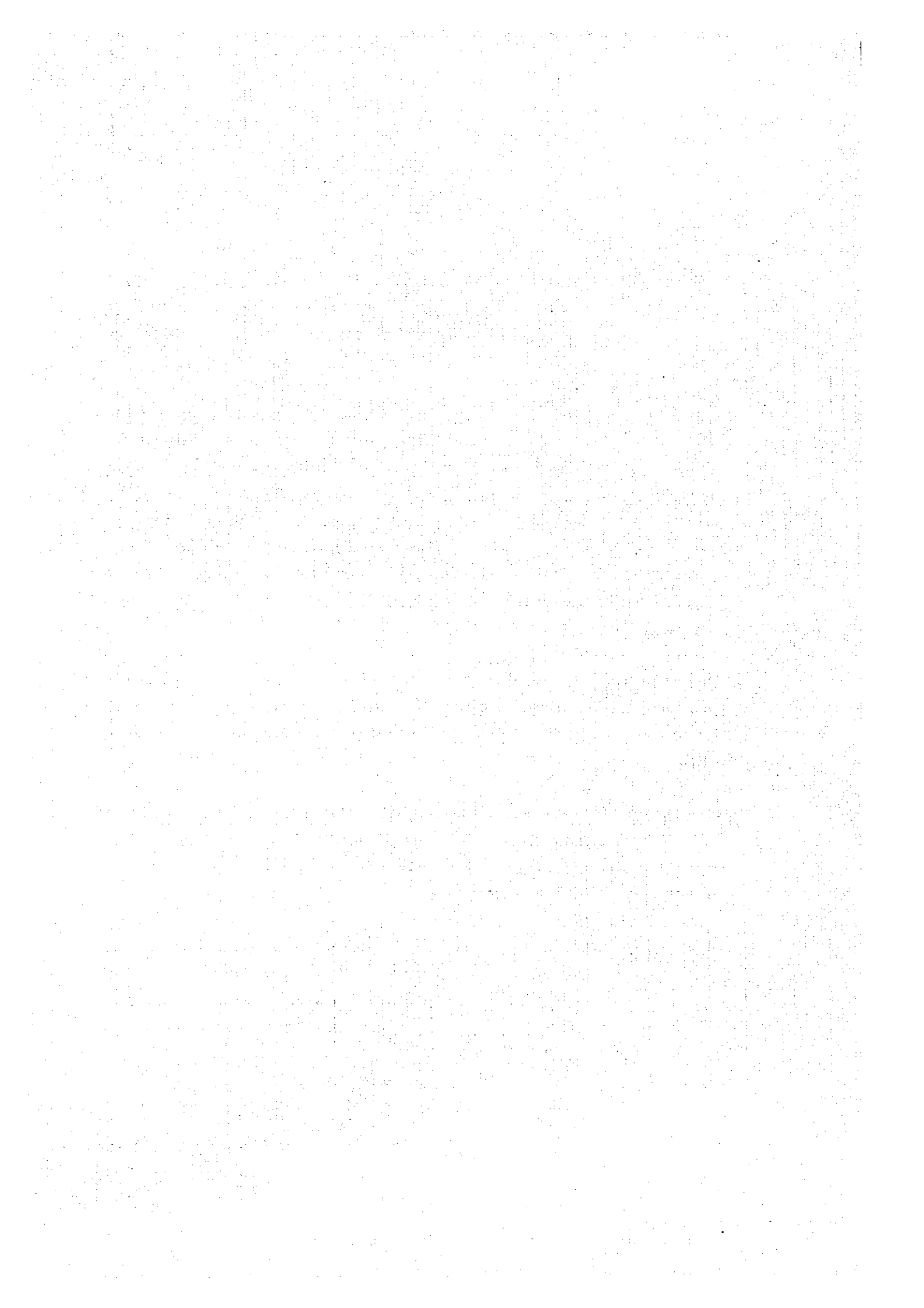
Mid-term:	Two years before the end of the implementation stage of the third umbrella cooperation
End of implementation:	At the end of the implementation period
Post-project:	At the time proposed by the evaluation team carried out at the end of the implementation period

6 RECOMMENDATIONS

1. The priority projects and their implementation plans proposed in this report are the most appropriate ones under the prevailing conditions. In case of change in those conditions, the priority of projects need to be changed or new project are to be added to the cooperation scheme and at each time those projects should be examined under the method proposed in this report. For the adoption of the project proposed or

suggested, the conventional procedures should be applied.

2. Since the ['1-3-8' Goal-Target-Activity Matrix] (Fig. 5) used in the projects grouping is produced based on the present status of the urgently required measures in each agro-ecosystem, the relative importance among the components showed in the matrix are to be revised in future in accordance with the progress of the development and/or other external conditions.
3. The study on the economy of agricultural households and intentions of farmers made in this study shall be a base line to measure the socio-economic development and also to trace the development course of the villages to be benefited by the projects in the future, as well as to understand the present conditions and the intentions of the agricultural households in the object areas of the study. In the future, the areas to be benefited by the project and similar areas in the vicinity shall be selected for each project, and similar study as mentioned above shall be conducted continually at regular intervals. So that the effects of the project shall be evaluated in an unbiased manner.
4. In case the Farm Household and Farmers' Intention Survey need to be conducted in the future, it is recommended that the time and man-power necessary for collecting and analyzing the data shall be fully considered at the planning stage of the survey itself.
5. It is important to further strengthen the cooperation between Indonesian and Japanese side in the promotion of the umbrella type cooperation. It is specially important to have close functional cooperation and adjustment among various departments and ministries in the Indonesian Government.
6. In carrying out monitoring and evaluation of the umbrella type cooperation, the positive cooperation of the four ministries with the Secretariat of Umbrella Cooperation is indispensable. It is necessary to build a system in which the persons in charge in these four ministries can respond quickly to the requests made by the Secretariat of the Umbrella Cooperation.



**THE STUDY
ON
THE THIRD UMBRELLA COOPERATION
FOR
INTEGRATED AGRICULTURAL AND RURAL DEVELOPMENT
IN
THE REPUBLIC OF INDONESIA**

FINAL REPORT

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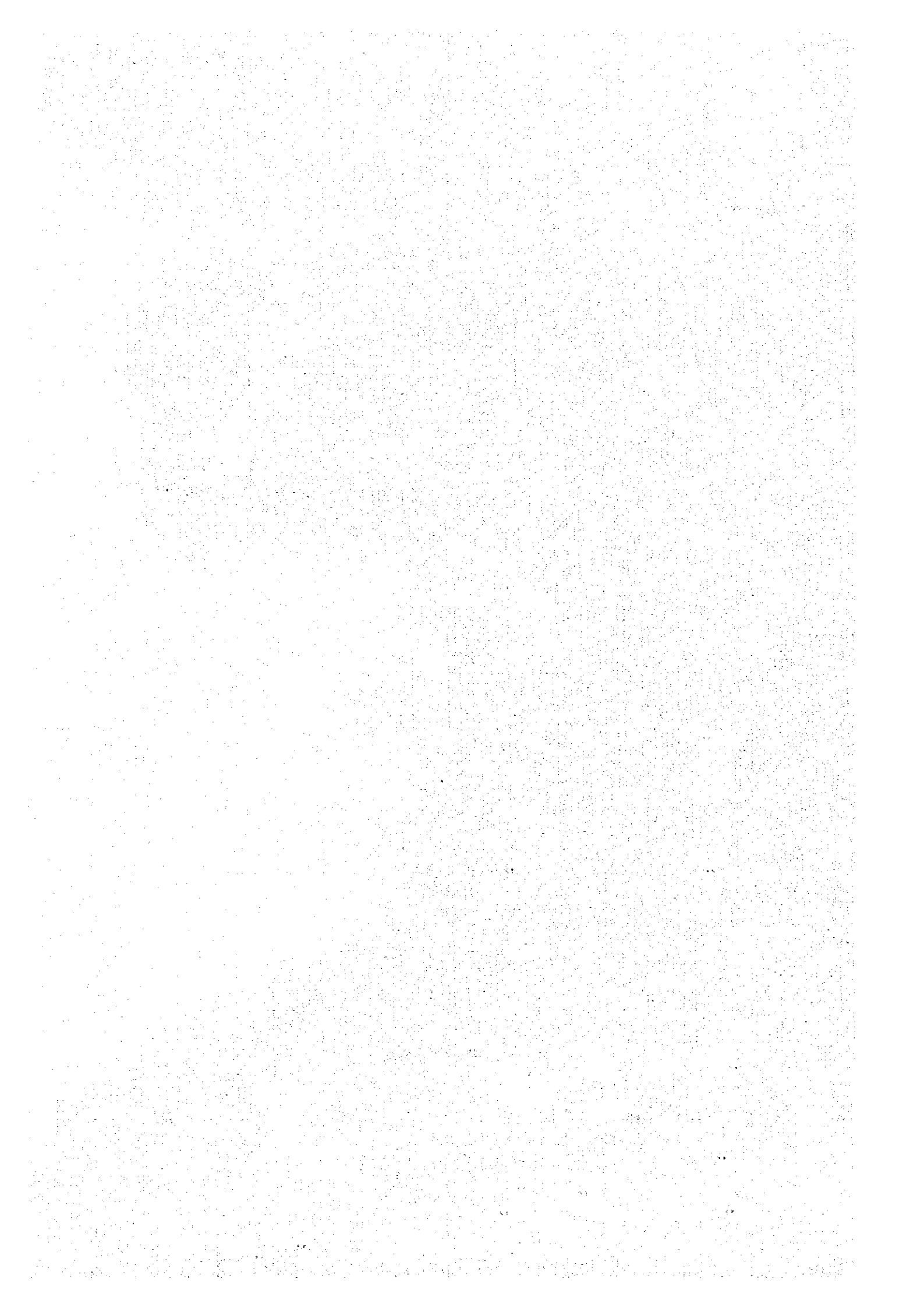
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ABBREVIATIONS

AAB	Agency of Agri-Business
AARD	Agency of Agricultural Research and Development
AAET	Agency of Agricultural Education and Training
ADC	Agricultural Data Center
AEC	Agricultural Extension Center
APBD	Provincial Government Budget
APBN	Central Government Budget
AQC	Agricultural Quarantine Center
ADB	Asian Development Bank
BAPPENAS	National Development Planning Board
BAPPEDA	Regional Development Planning Agency
BIMAS	Mass Guidance for Self-Sufficiency in Foodstuffs
BKK	Bank of Kecamatan Credit
BPTP	Food Crops Protection Center
BPS	Provincial Statistical Office
BULOG	National Food Logistic Agency
CBS	Central Bureau of Statistics
CIDA	Canadian International Development Agency
DGE	Directorate General of Estate Crops
DGF	Directorate General of Fishery
DGFCH	Directorate General of Food Crops and Horticulture
DGLS	Directorate General of Livestock
DGMD	Directorate General of Mobilization and Development
DGRCD	Directorate General of Rural Cooperatives Development
DGRPHS	Directorate General of Regional Plan and Human Settlement
DGSE	Directorate General of Settlement and Environment
DGSED	Directorate General of Small Enterprises Development
DGUCD	Directorate General of Urban Cooperatives Development
DGWRD	Directorate General of Water Resources Development
DINAS	Provincial Agricultural Services
FOA	Food Aid
FTC	Free-standing Technical Cooperation
F/S	Feasibility Study
GDP	Gross Domestic Product

GOI	Government of Indonesia
GRDP	Gross Regional Domestic Product
GTZ	German Agency for Technical Cooperation
IBRD	International Bank for Reconstruction and Development
IPA	Investment Project Assistance
IPT	Investment Project Technical Cooperation
ITC	Investment-related Technical Cooperation
JICA	Japan International Cooperation Agency
KUD	Village Unit Cooperative
M/P	Master Plan
MOA	Ministry of Agriculture
MOCSED	Ministry of Cooperatives and Small Enterprises Development
MOPW	Ministry of Public Works
MOTFSR	Ministry of Transmigration and Forest Squatter Resettlement
OECD	Overseas Economic Cooperation Fund
PBB	Programme/ budgetary aid or Balance-of-Payments support
PPL	Field Extension Worker
PPS	Agricultural Extension Specialist
R/D	Record of Discussions
REPELITA	National Five-year Development Plan
RIFSA	Research Institute for Food Crops on Swampy Area
SG	Secretariat General
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
WFP	World Food Programme
2KR	Second Kennedy Round

CHAPTER 1 : INTRODUCTION



CHAPTER 1: INTRODUCTION

1.1 Background of the Study

1.1.1 Agriculture in Indonesia

After the First Long-Term Development Plan (PJPT I) was started in 1969, the gross domestic products (GDP) has increased steadily with an annual growth rate of 6.8% (12.0% for the industrial sector and 3.6% for the agricultural sector). The agricultural sector led the growth of GDP in the beginning. As a result of agricultural development, self-sufficiency of rice was achieved in 1984. During 1988 to 1993, the manufacturing sector took up the first position replacing the agricultural sector. This means that the Indonesian economic

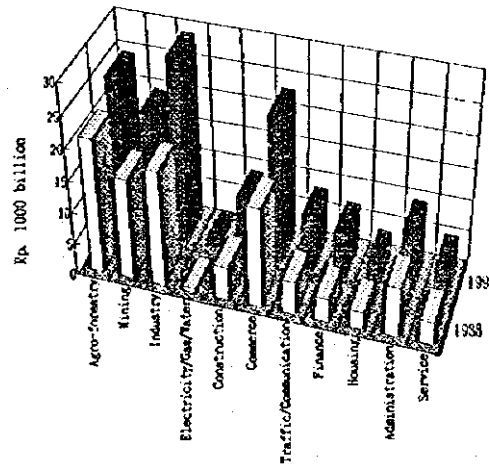


Fig. 1.1.1 GDP in Indonesia

(Statistical Yearbook of Indonesia, 1994)

structure has shifted its importance from agriculture sector to manufacturing and service sectors. As far as agriculture is concerned, the working population in the sector occupies about 50% of the total, but the productivity of the sector is less than half of other sectors. This evidence shows the need for further agricultural development and its importance in national economic growth. On the other hand, In Indonesia, labor related problem is represented by the situation that about 70 % of economic active population belongs to the group of un-organized laborer such as tenant farmers and workers without permanent job, and majority of them are concentrated in Java island. In this situation, transmigration projects are carried out as one of the strategies to solve this problem. And, successful implementation of transmigration is necessary to improve agricultural productivity.

The Second Long-Term Development Plan (PJPT II) or the Sixth Five-Year Development Plan (REPELITA VI) was started in 1994. It aims at achieving three principles (Development, Stability and Equality of economic development) simultaneously in all economic sectors based on establishment of self-reliance mechanisms in each sector within the planning period. The main targets of the plan for all sectors are as follows:

- ① quality improvement of human resources
- ② equality of people and overcoming poverty
- ③ balanced development in rural and urban areas
- ④ improvement of land use

1.1.2 Background of the Study

The Japanese and Indonesian Governments have jointly initiated the Umbrella Cooperation for Integrated Agricultural and Rural Development (the first between 1981 and 1985, and the second between 1986 to 1990) aiming at the optimum results and efficiency in cooperation through a combination of available Japanese Official Development Assistance. These cooperation contributed to the self-sufficient and sustainable production of rice and increased production of other crops.

The Sixth Five-Year Development Plan (REPELITA VI, from 1994/95 to 1998/99) has already been started. Main targets for sub-sectors concerning the Third Umbrella Cooperation Program are summarized below;

- Agriculture** : increase of products, diversification of crops and increase of quality, collaboration with other economic sectors, increase of productivity and work opportunities in the agricultural sector. The final goal of the Plan is to increase the living standard of farmers who occupy more than 50% of the total labour forces in Indonesia.
- Irrigation** : to deliver adequate supply of water to residential users, industries, and tourism, to generate electricity and for other purposes. It also seeks to create an efficient and effective management of sources of water and the distribution thereof. Further, it seeks to promote public participation in the construction of irrigation facilities and development of dependable institutions to manage the sources of water and to distribute water.
- Transmigration** : Structuring the population dissemination as manpower of targeted area both from Origin and Transmigration area is amounted to 600,000 families. To develop the settlement with many kinds of business so that the transmigrant will be independent and release from poverty line.
- Cooperatives** : Promoting the cooperatives to function in all provincial level economic

field as sound enterprises and places where opportunities of economic activities are available for more people.

The Indonesian Government officially requested the Government of Japan for the third Umbrella Cooperation (hereinafter referred to as the "Third Umbrella") in December 1992. Responding to the request, the Government of Japan sent Project Formation Missions to Indonesia in May/July 1994 and May 1995. These missions discussed the frameworks, implementation system, details of cooperation of the Third Umbrella. As a result of discussions, both governments exchanged the Minutes of Meeting (M/M) on the framework of the Third Umbrella on May 16, 1995. Following the Minutes, both governments exchanged the Record of Discussion (R/D) on the Third Umbrella in Indonesia on October 6, 1995. In the R/D, the purpose of the Third Umbrella was described as shown below;

Purpose of the Cooperation

- The Japanese and Indonesian Governments will jointly initiate the Umbrella Cooperation for Integrated Agricultural and Rural Development aiming for optimum results and efficiency in cooperation through a combination of available Japanese Official Development Assistance schemes in technical and financial assistance, and in coordination with projects working towards the same goal and those currently being implemented by the Indonesian Government with or without foreign assistance.

- The Umbrella Cooperation will be implemented with the purpose of improving the standard of living of farmers through three major objectives: improving farming productivity, efficiency and sustainability; increasing quantity and quality of farm production and diversification; and adding value to farm products. Thus, it will eventually contribute to the alleviation of rural poverty. Through this process, the Third Umbrella Cooperation is expected to promote activities for building an integrated system and mechanism of agricultural development aimed at improvement in the living standard of farming communities, as a major goal of the Sixth Five-Year Development (REPELITA VI).

Eventhough, the R/D specified the frameworks of the Third Umbrella, the methodology of the prioritization for project to be implemented under the Third Umbrella within the next five years was not clarified.

Based on the conditions mentioned above, the Government of Indonesia officially requested the Japanese Government for the technical assistance to formulate a master plan for the Third Umbrella on October 20, 1995. In response to the request, the Government of Japan decided to conduct the Study on the Third Umbrella Cooperation for the Integrated Agricultural and Rural Development in Indonesia (hereinafter referred to as "the Study"). Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programs of the Japanese Government, undertook the Study in close cooperation with the Government of Indonesia. The preparatory mission was dispatched in December 1995 and the Scope of Works (hereinafter referred to as "S/W") for the Study was concluded on December 6, 1995 as attached in Annex A of this report. Based upon the S/W, JICA organized and dispatched the team to implement the Study (hereinafter referred to as the "Study Team"). The field survey was carried out in February and March, 1996 and the home office work was carried out in May, 1996. Based on the results of field survey and home office work, the Draft Final Report was prepared and submitted in the end of May, 1996 and explanation and discussion on the Draft Final Report was carried out at Jakarta in the first of June, 1996. The workshop for the Third Umbrella Cooperation was opened on June 6, 1996 and the results of the Study were reported at the workshop.

Based on the Draft Final Report and the comments of the Indonesian side, this report has been prepared by the Study Team as the Final Report of the Study.

1.2 Objectives of the Study

In order to improve the standard of living of farmers, the Third Umbrella Cooperation for Integrated Agriculture and Rural Development targets three major objectives, i.e. i) improving farming productivity, efficiency and sustainability, ii) increasing quantity, and quality of farm production and diversification, and iii) adding value to farm products. The components of the study are specified as follows:

- 1) human resources and system of development of central and local government to improve planning and administrative capabilities
- 2) improvement of the capability in research to support development of appropriate production technologies

- 3) development of agriculture extension systems in order to improve farm management and to promote diversification in agricultural production
- 4) development of irrigation and drainage facilities and improvement of water resources management systems
- 5) development of a system for effective promotion of agricultural credit
- 6) development and strengthening of the activities farmers' organizations
- 7) development of post-harvesting activities including handling, processing and marketing of agricultural products to improve and add value to farm product
- 8) improvement of rural infrastructure

The Study aims i) to propose appropriate development direction after giving due consideration for present conditions of the above 8 components and actual needs of four model provinces (South Sulawesi, West Java, West Nusa Tenggara and South Kalimantan), and to prepare the integrated master plan of the Third Umbrella Cooperation after giving due consideration for projects' priorities in local and central government under the development direction mentioned above and to ii) to transfer the skill and knowledge applied for this Study, to the Indonesian counterpart personnel through on-the-job training during the course of the Study.

Also, in the Third Umbrella Cooperation, the activities such as farm management, postharvest, extension, Agricultural finance, infrastructure etc. are implemented integrally for the improvement of farmers' income and welfare. The whole scheme of this framework is considered as "the agribusiness system development" and due consideration on "agribusiness system development" has also been given in the Study.

1.3 The Study Area

For the regional projects, the Study concentrates on areas with respect to each targeted agro-ecosystem in the following four provinces:

- | | |
|--------------------------------|------------------------|
| 1) South Sulawesi Province | Irrigated Area |
| 2) West Java Province | Highland Area |
| 3) West Nusa Tenggara Province | Lowland (Rainfed) Area |
| 4) South Kalimantan Province | Swamp Area |

In addition, the Study also includes related central government projects in the above mentioned four provinces.

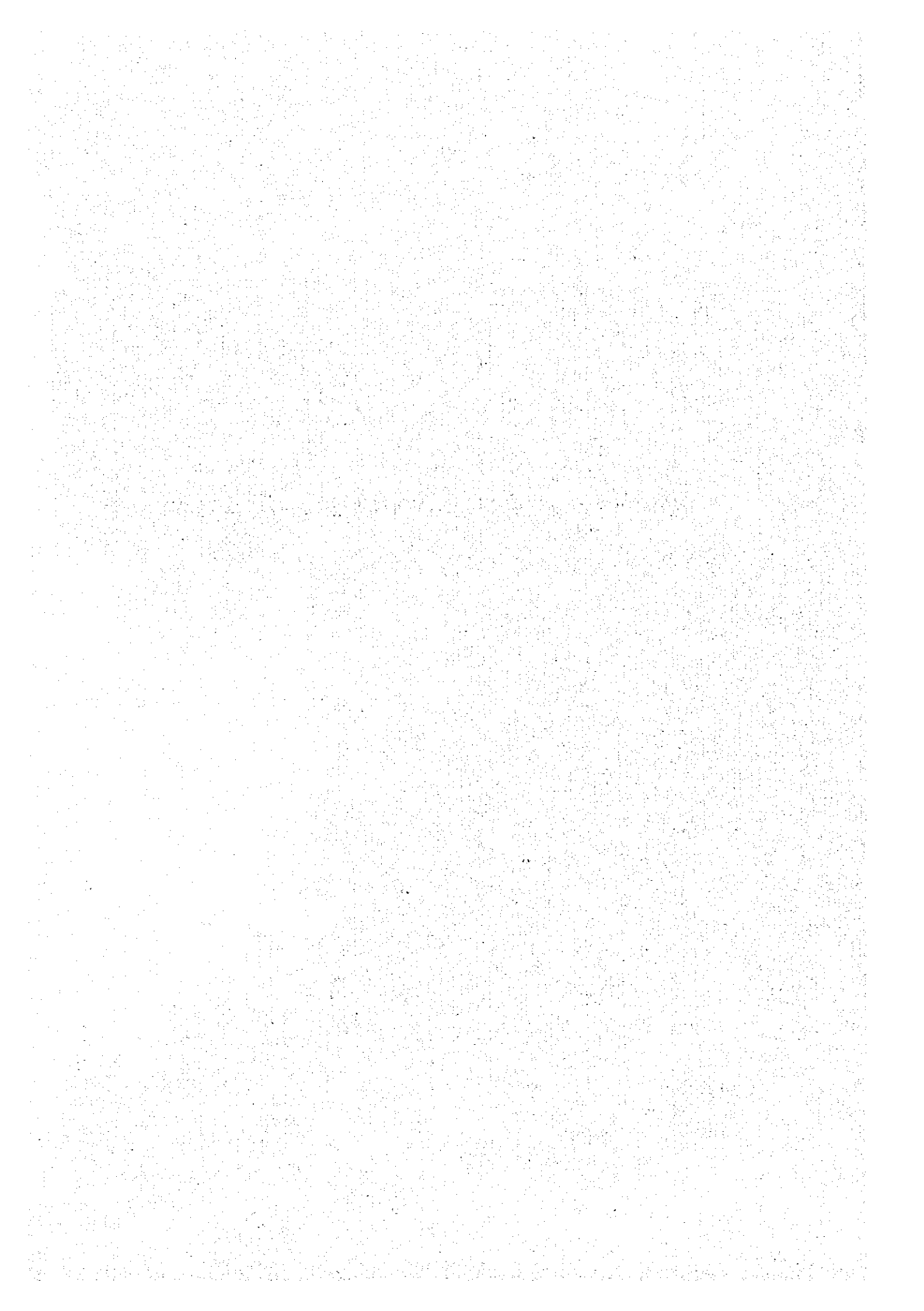
1.4 Scope of the Study

In order to achieve the above mentioned objectives, the Study which consists of field work in Indonesia and home office work in Japan was carried out. They are also divided into those to be performed within the Japanese fiscal year 1995/96 and 1996/97. Work items for each phase are shown in Table 1.4.1.

Table 1.4.1 Scope of the Study

Phase	Physical Year	Step	Work Item
Phase I	1995/1996	Work in Indonesia	Explanation & Discussion on Inception Report Discussion on Methodology for Technical Transfer & Technical Transfer Plan for each Province Clarification of Concept of Agro-ecosystem Collection & Review of Relevant Data & Information Field Survey Farm Household Economic & Farmers' Intention Survey Study of Relationship between Central & Regional Projects Discussion and Review of Evaluation & Monitoring Methodology for the Overall Umbrella Cooperation Identification of Development Need & Constraints and Study of Basic Development Concepts for four Agro-ecosystems Review of Overall Projects Discussion & Study on the Criteria of Priority for the Projects Study of the Umbrella Cooperation Project List Preparation & Discussion of Progress Report
Phase II	1996/1997	Work in Japan	Report of Field Work in Indonesia Analysis of Field Survey Results Study of Relationship & Synergistic Effect among the Umbrella Projects Recommendation of High Priority Projects Proposal for the Draft Monitoring & Evaluation Methodology of the Overall Umbrella Cooperation Recommendation of Implementation Schedule for Overall Umbrella Cooperation Preparation of Draft Final Report
		Reporting	Explanation & Discussion on Draft Final Report Opening of Workshop
		Final Stage	Preparation of Final Report

CHAPTER 2 : GENERAL CONDITIONS OF THE STUDY AREA



CHAPTER 2 : GENERAL CONDITIONS OF THE STUDY AREA

2.1 General Conditions

General conditions of the Study Area are summarized as shown in Table 2.1.1 and the features are described below.

- Climate Conditions

Climate conditions of the Study Area are summarized in Fig. 2.1.1. The West Nusa Tenggara Province (NTB) is the driest area and the west Java Province is the coldest area among the four Study Areas.

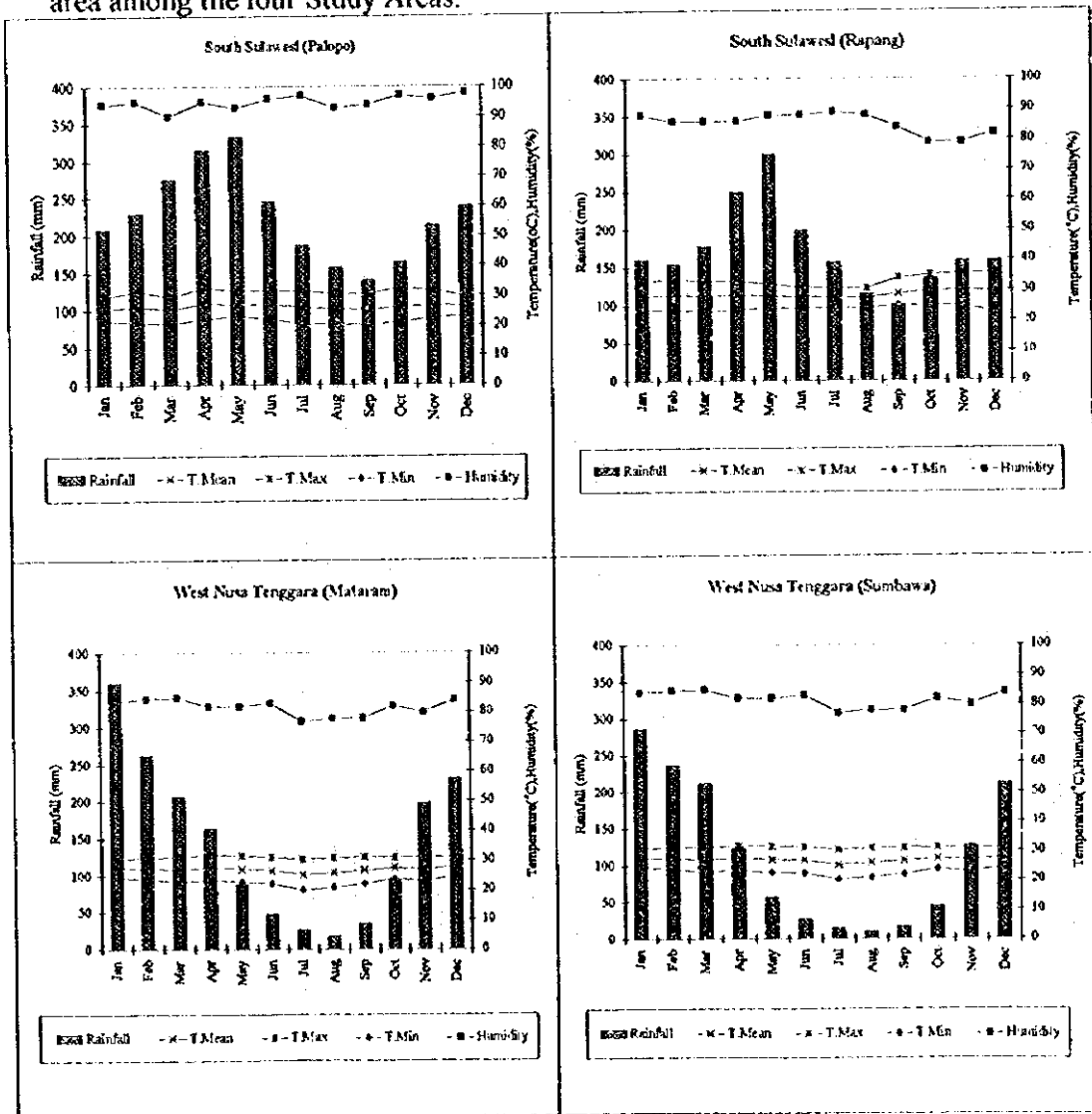


Fig. 2.1.1 Summary of Climate Condition in the Study Area (1/2)

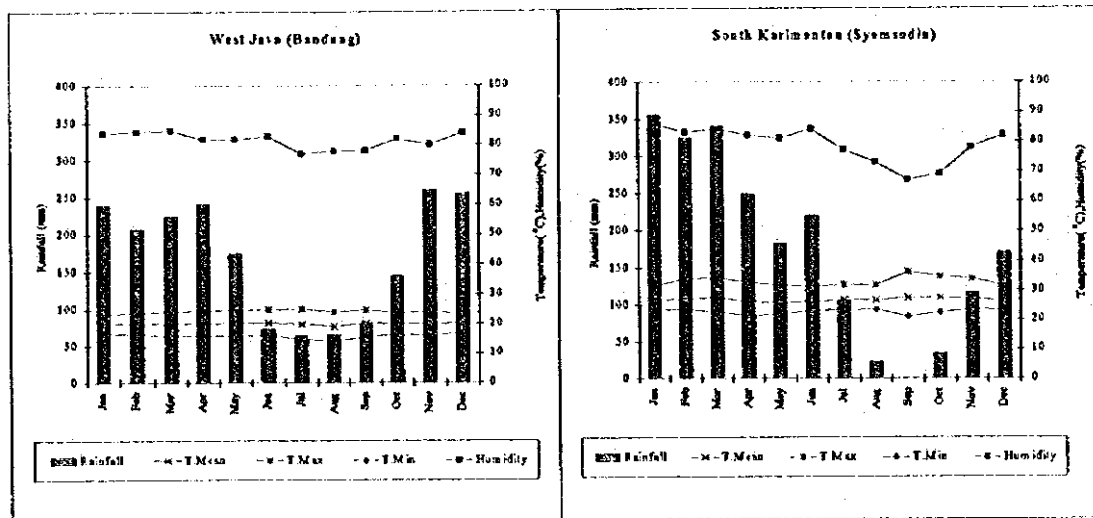


Fig. 2.1.1 Summary of Climate Condition in the Study Area (2/2)

- Land Use
- Land Use in the Study Area is summarized as shown in Fig. 2.1.2. The proportion of paddy field in the West Java is the highest among the four Provinces and NTB has the highest proportion forests.

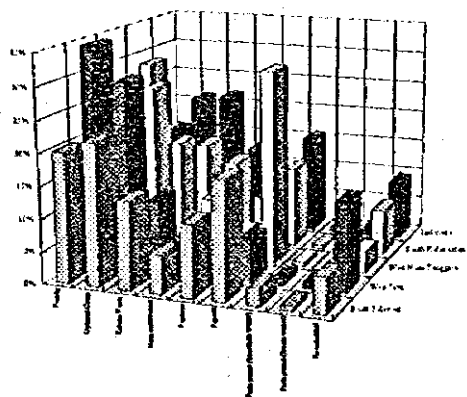


Fig. 2.1.2 Portion of Land Use in the Study Area

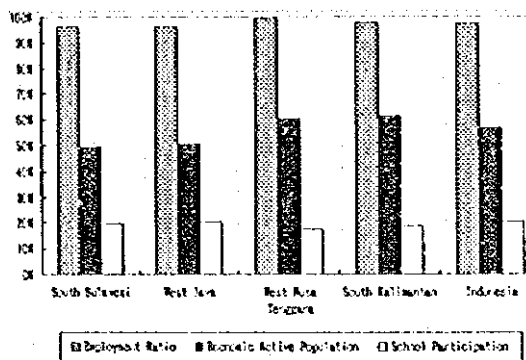


Fig. 2.1.3 Employment Ratio, Economic Active Population and School Participation

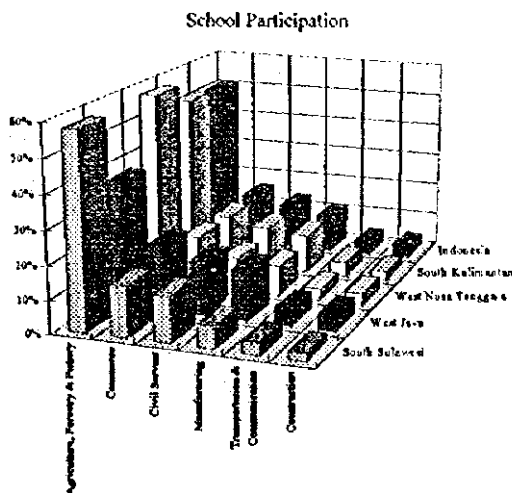


Fig. 2.1.4 Labour Force Share by Sector

- **Social Conditions**

Employment ratio, percentage of economic-active population and school participation in the Study Area are summarized as shown in Fig.2.1.3. Economic-active population in NTB is the highest and school participation in NTB is the lowest among the four Provinces. Fig 2.1.4 shows the share of labour force by sector. The labour force of agricultural sector in West Java is the lowest. The share of industry in GDP is comparatively low in South Sulawesi and NTB as shown in Fig.2.1.5

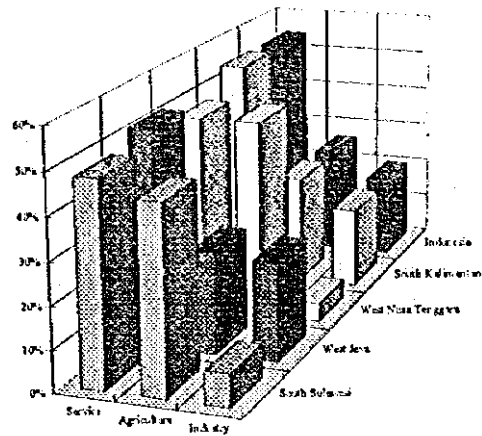


Fig. 2.1.5 GDP Sector Share

- **Agricultural Production**

The production share of main crops are summarized in Fig. 2.1.6. Share of main crops in the West Java is the highest among the four Provinces. Considering the agricultural land area, share of Palawiji in NTB is comparatively high. The conditions of livestock in each Province is summarized in Fig. 2.17.

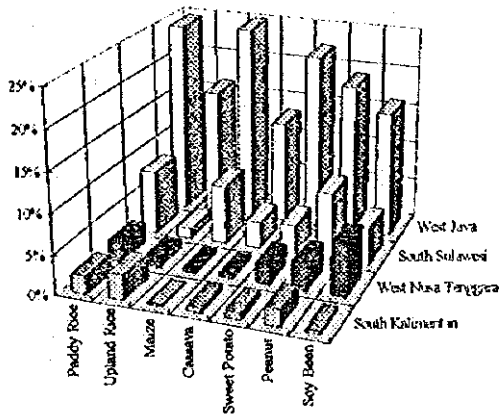


Fig 2.1.6 Production Share of main Crops

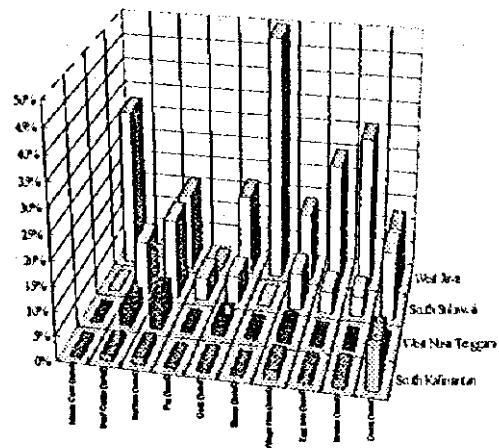


Fig 2.1.7 Share of Livestock

Table 2.1.1 General Conditions of the Study Area

Study Area		South Sulawesi	West Java	West Nusa Tenggara	South Kalimantan	Indonesia	Remarks	
Agro-ecosystem		Irrigated Area	Highland Area	Lowland (rainfed) Area	Swamp Area			
Natural Conditions	Latitude	5° - S	7° - S	8° - S	3° - S			
	Provincial Area (km ²)	72,781	46,300	20,177	37,600	1,919,317		
	National weight (%)	3.79%	2.41%	1.05%	1.96%	100.00%		
	Annual Rainfall (mm)	2,829	2,024	1,813	2,365	-		
	Annual Mean Temperature (°C)	27.4	20.1	26.8	27.7	-		
	Annual Max. Temperature (°C)	32.9	28.8	31.7	33.3	-		
Annual Min. Temperature (°C)	21.5	17.1	20.8	21.8	-			
Land Use (ha)	Arable Land	Paddy	606,726	1,184,638	200,874	478,195	8,499,037	in 1993
		Upland Crop	659,665	1,003,331	223,037	256,251	11,775,503	
		Estate Farm	408,458	380,131	15,728	256,836	12,086,679	
		Non cultivated	181,636	20,715	76,492	214,087	7,160,808	
		Pasture	335,128	37,700	35,678	124,678	2,014,472	
	Forest	546,187	221,322	256,055	210,521	8,691,571		
	Fish pond (blackish water)	85,741	32,899	5,559	5,633	307,575		
	Fish pond (fresh water)	21,308	31,992	718	7,704	176,000		
Residential	168,088	466,693	27,987	120,124	5,142,696			
Population Labour Forces	Total Population (thousand)	6,983	35,384	3,370	2,598	179,379	in 1990	
	National weight (%)	3.89%	19.73%	1.88%	1.45%	100.00%		
	Population Density per km ²	90	765	167	69	93	in 1990	
	Annual Growth Rate	1.42	2.57	2.15	2.32	1.98	average 1980-1990	
	Average Household Population	5.0	4.3	4.4	4.4	4.5	in 1990	
	Labour Forces (thousand)	5,578	28,458	2,563	2,119	143,792	in 1993	
	Employment Ratio	96.37%	96.11%	99.22%	97.65%	97.24%		
	Economic Active Population	49.45%	50.73%	60.42%	61.17%	56.64%		
	School Participation	19.69%	20.58%	17.35%	18.90%	20.48%		
	Labour Forces by Sector (thousand)	Agriculture, Forestry & Fishery	1,537.1	5,167.2	887.5	652.2	40,071.9	in 1993
Mining		17.7	156.7	21.3	24.9	653.3	unit thousand	
Manufacturing		176.7	2,065.5	135.7	144.6	8,784.3		
Electricity, Gas & Water Supply		4.3	45.3	0.9	2.5	171.6		
Construction		60.6	668.9	51.1	33.7	2,810.4		
Commerce		400.8	2,722.3	231.8	189.3	12,508.1		
Transportation & Communication		96.2	714.6	50.9	53.6	2,931.3		
Financing & Service		6.5	103.5	3.8	5.7	565.0		
Civil Servant		358.7	2,217.9	152.3	157.6	10,566.4		
Others		1.3	14.7	0.8	1.5	138.4		
GDP	GDP (billion Rp.)	6,071	41,064	1,870	3,166	259,884	in 1992	
	GDP per Capita (thousand Rp.)	870	1,161	555	1,218	1,449		
	GDP Provincial Share	2.34%	15.80%	0.72%	1.22%	100%		
	Growth Rate	17.39%	20.63%	24.22%	20.69%	20.72%	average 1988-1992	
	Sector Share	Agriculture	41.20%	24.50%	47.80%	26.20%	25.96%	in 1990
Industry		7.70%	23.50%	4.50%	19.40%	19.70%		
Service		48.10%	52.00%	47.70%	54.40%	54.40%		
Road Condition	Provincial Road Length (km)	1,690	2,028	670	709	38,099	in 1990	
	Density (km/1000km ²)	23.2	43.8	33.2	18.8	19.9		
	Kabupaten Road Length (km)	19,923	17,946	3,355	4,834	225,611		
Main Agricultural Production	Paddy Rice (1000t)		273.6	387.6	166.3	128.4	117.5	
			3,438	10,406	1,107	964	42,413	in 1992
	Palmyra	Upland Rice (1000t)	35	457	33	89	2,826	
		Milch Cow (head)	0	113,803	0	79	350,729	in 1993
		Beef Cattle (head)	1,245,595	184,363	425,245	135,616	11,355,878	
		Buffalo (head)	541,655	529,108	214,008	49,669	3,369,671	
		Pig (head)	408,325	49,348	24,087	12,922	8,634,831	
	Livestock	Goat (head)	653,498	1,902,353	266,854	58,846	11,501,847	
		Sheep (head)	11,898	3,339,332	37,474	3,487	6,697,137	
		Village Hen (head)	18,181,270	32,499,328	4,525,400	4,517,092	236,602,904	
Egg hen (head)		2,245,480	12,165,861	179,601	432,688	49,401,786		
Duck (head)		2,292,853	11,555,620	0	949,641	57,089,692		
Duck (head)		3,847,451	3,463,529	58,239	7,769,079	27,655,644		
Administration		Number of Regions	21	20	6	9	243	in 1994
		Number of Cities	2	5	1	1	60	
	Number of Districts	185	526	59	109	3,836		
	Number of Villages	2,646	7,124	587	2,169	65,198		
Literates	Rate of Literacy (%)	81.8	87.3	69.7	89.8	84.0	in 1993	
	Infant Mortality (per 1000 infant)	56.5	71.1	109.4	76.0	58.1		
	Average Span of Life (age)	63.1	59.8	52.0	58.7	62.7		

(Statistical Yearbook of Indonesia, 1994)

2.2 Model Area

General conditions of the model areas for the Third Umbrella Cooperation are summarized below;

- South Sulawesi (Irrigated Area)

The model area is located in the central part of the province and includes the irrigated lowland area where many irrigation systems were installed from the days of Dutch occupation, and new irrigation systems have been installed under the transmigration projects. Typical cropping pattern practiced in this area is double cropping of rice. Triple cropping (paddy-paddy-Palawija) is also practiced by some farmers. The model area covers one of the major rice production zones of Indonesia both in quantity and quality. This area plays an important role in supplying rice as same as Java region. Many of the irrigation systems were developed so as to adopt traditional farming systems. Therefore, existing farm roads and drainage canals are not planned for the new farming system utilizing agricultural machinery. To respond to growing population and increasing rice demand, the improvement of agricultural productivity and diversification by modernizing farm roads and drainage canals are expected in this area.

- West Java (Highland Area)

The model area is located in the mountain region extending approximately 240 km from west to east and in the center of the Province and includes mountain peaks of 2,000m - 3,000m above sea level and basins at relatively lower altitude. In general, area with an altitude of more than 800 m is defined as "highland". In this area, the highland is located along mountain slopes and is characterized by its complex topographical configurations. Under the conditions of cool climate with average temperature of around 20 °C and the proximity to large cities of Jakarta, Bekasi, Tangerang, Bogor, Bandung and Cirebon, cultivation of paddy and Palawija has been over taken by cultivation of horticultural crops of the temperate zone origin which are hard to be cultivated usually in the lowlands of Indonesia. And also dairy production with Holstein cattle are newly introduced. In these large cities, increase of population, and diversification and sophistication of diet are forecasted together with the economic development. Under these circumstances, increase in the production of

vegetables and livestock corresponding to quantitative increase and qualitative change in their demand is expected in this area.

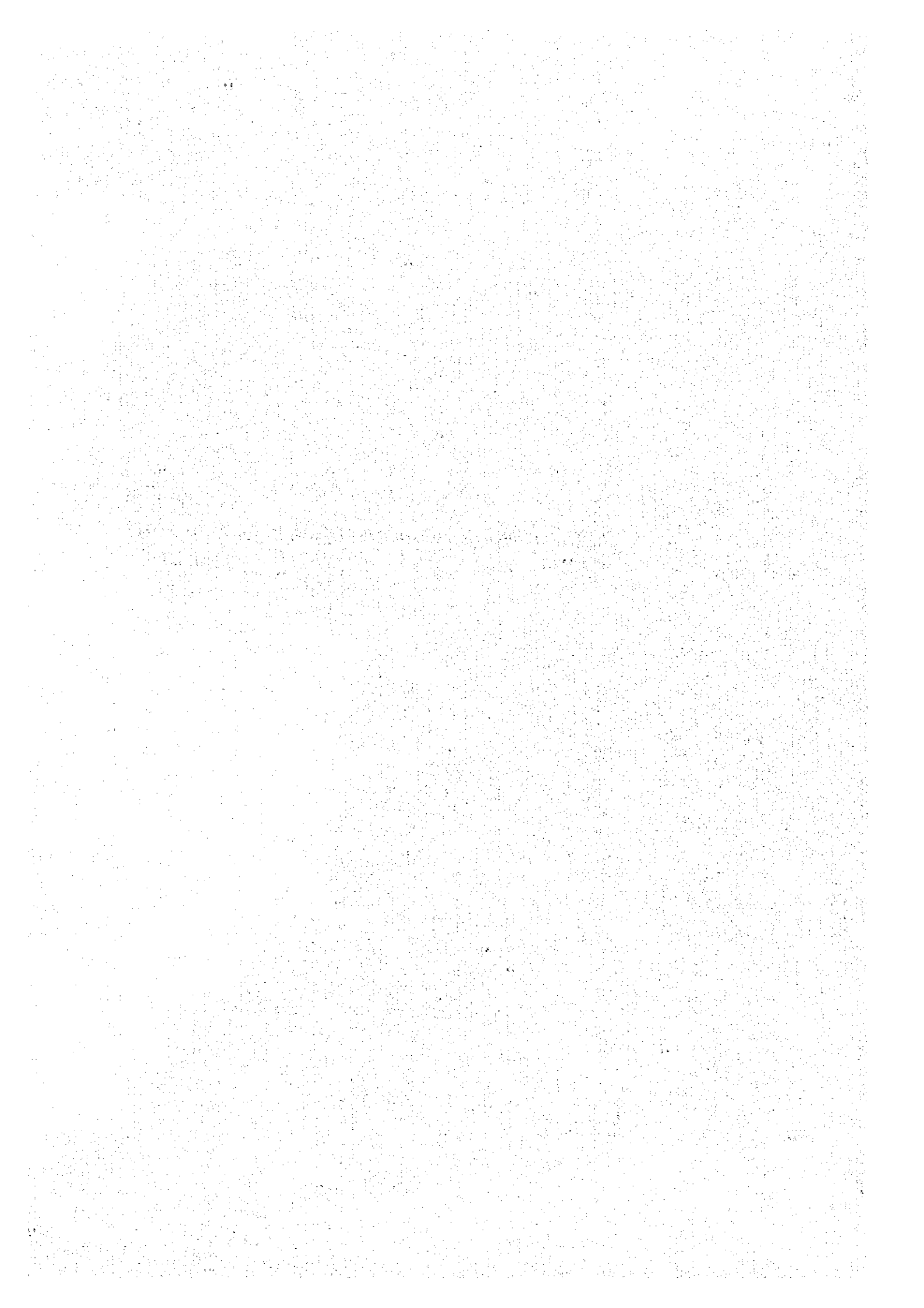
- **West Nusa Tenggara (Lowland [rainfed] Area)**

Although "rainfed agriculture" is commonly defined as a production system without irrigation facility, rainfed agriculture in NTB can be described as production system relying on rainfall, and the present agricultural area in lowland is considered to be the model area for the Third Umbrella Cooperation. There is approximately 318,000 ha of cultivated area in NTB. Out of this, 201,000 ha is used for paddy cultivation. Eventhough established irrigation systems are available for more than 80% of paddy fields, irrigation area decreases to around 40% in dry season (May - Oct.) due to insufficient water and consequently Palawija is planted in most of the paddy fields. Upland field is mainly used for inter cropping of Palawija and fruit trees. In this area, limited water supply for irrigation in dry season is recognized as a major limiting factor for agricultural development and hence several projects for water resource development have been implemented. Therefore, improvement of farming system through introduction of suitable and profitable crops, enhancement of cooperative works etc. are considered to be necessary for further development.

- **South Kalimantan (Swamp Area)**

Model area is located in the lowland and is scarcely undulating. As the mean elevation of the area is mostly less than 2 m, it is under the effect of tides. Especially, the Lower Barito River basin is directly influenced by tides containing saline water. Tidal irrigation is commonly used in this area when the sea level becomes high. The soil type in this area is peat / alluvial, accumulated as result of coastal plants and sediments deposition. Due to the high sulfate contents, most of the soil in the model area shows high acidity. Rice is the main crop, occupying 70% of the total cultivated area. Due to the natural constraints of flood, high acid soil and lack of infrastructure, farmers depend on traditional methods for rice cultivation using local varieties. As a result, both land and labor productivity are low compared with other provinces. Integrated agricultural development including establishment of cropping system centered on rice and improvement of infrastructure is required for agricultural development in this area.

**CHAPTER 3:
DIRECTIONS OF AGRICULTURAL DEVELOPMENT
IN THE MODEL AREA**



CHAPTER 3 : DIRECTIONS OF AGRICULTURAL DEVELOPMENT IN THE MODEL AREA

3.1 Agro-ecosystem

According to R/D signed on October 6, 1995, discussions were held to determine the objectives of agricultural development in third Umbrella Program for each agro-ecosystem. As a result, the objectives for each agro-ecosystem were understood as described below;

South Sulawesi (Irrigated Area)

- To improve the productivity of paddy field, in accordance with the rice demand increase, through such projects as improvement of infrastructure for agricultural production including irrigation and drainage facilities and water management, promotion of farmers' cooperative activities and promotion of utilization of agricultural machinery
- To promote the diversification in agricultural crops through such projects as improvement of technology and dissemination.

West Java (Highland Area)

- To promote diversification in agricultural production, especially horticulture and the livestock management, through such projects as quality improvement of seedling and propagation, dissemination of production technology, improvement of post-harvest and processing technology, and promotion of farmers' organization.

West Nusa Tenggara (Lowland [rainfed] Area)

- To promote appropriate production system in the region through such projects as selection of appropriate crops and development of production technology and its extension, development of small scale water resources.

South Kalimantan (Swamp Area)

- To achieve comprehensive agricultural development program through such projects as improvement of drainage and introduction of appropriate cropping system.

Based on the above mentioned objectives and the results of field survey, the conception of agro-ecosystem was summarized in the following table;

South Sulawesi (Irrigated Area)	
Natural Conditions	This area is represented by flat land with abundant water resources of major river system. Average temperature is approximately 27°C and annual precipitation reaches to 2,800mm. Rainy season generally occurs between the months of March and May, however, this varies substantially for each area in the province.
Socio-economical Conditions	Agriculture is the major industry and 63% of the people are engaged in agricultural industry. This rate is the highest among the four provinces. For some agricultural produce, self sufficiency is achieved and surpluses are exported to other provinces.
Agricultural Conditions	Since the era of Dutch occupation, irrigation facility has been developed. The proportion of irrigated land is 80% for paddy field and double cropping of rice has been practiced by utilizing the abundant water resources. In this study, main stresses are put on the existing irrigation area.
West Java (Highland Area)	
Natural Conditions	Mountainous area in the tropical zone. In general, this area have elevation of 800 - 1500 m above sea level and have moderate climate throughout the year, Average temperature is approximately 20 °C and the lowest temperature is approximately 15 °C.
Socio-economical Conditions	Consumption centers are located within marketable distances. And the food demand have been increasing and diversifying along with economic development.
Agricultural Conditions	Taking advantage of its cool climate in tropical zone , horticultural crops and livestock introduced from temperate zone are produced to supply to the consumption centers.
West Nusa Tenggara (Low land [rainfed] Area)	
Natural Conditions	The area is located at low flat land area with an altitude of 50 ~ 500 m in the tropical zone. The annual rainfall is estimated as approximately 1,700 mm at the Lombok Island and 1,300 mm at the Sumbawa Island, and, about 85% of annual rainfall occurs in the rainy season (November ~ April)
Socio-economical Conditions	There is no main economical activity other than agriculture and 65% of labor forces is engaged in the agricultural sector. Most of all main trunk roads are paved, but the conditions of rural and farm roads are not improved.
Agricultural Conditions	Main crop is rice in rainy season and Palavija in dry season. Irrigation facilities are improved in more than 50% of agricultural lands, however, it is estimated that only 40% of that are irrigated in dry season.
South Kalimantan (Swamp Area)	
Natural Conditions	The area is under the direct effects of tide and tidal backwater. Its physiographic features are: - Low Land with elevation around 0 to 2 m. - Flat land which is scarcely undulating. - Peat soils developed in these area are mixed with sediments brought along river and water courses, Annual rainfall is about 2,200mm, mean temperature is 27°C.
Socio-economical Conditions	Agriculture is the most important sector, occupies 58% of the labor forces and 26% of GDP. The area has a relatively well maintained road net work except farm road, and transportation boats.
Agricultural Conditions	Rice is the major crop and paddy field occupies 69% of agricultural land in the study area. There are two cropping patterns for rice; single cropping using local varieties and double cropping using combination of local and improved varieties.

3.2 Farm Household and Farmers' Intention Survey

3.2.1 Procedure of the Survey

In this study, "Farm Household and Farmers' Intentional Survey" was conducted in order to comprehend economic conditions and intentions for development. In each province, a total of 800 farm households (20 farmers in each area, 10 areas in each province) were surveyed. The survey was conducted by questionnaire and the information collected forms into a part of the base-line data which can be compared with the data collected through future surveys.

The contents of the questionnaire were prepared covering the 8 components set for this cooperation and reviewed by the Indonesian counterparts before the survey was conducted. Through the discussion between the Japanese study team and the provincial level officials of Government of Indonesia, 10 villages representing the model area were selected for the survey. The list of selected villages in each province is shown in Table 3.2.1.

Then, in order to collect reliable information in a limited time, the extension officers (PPL) were nominated to conduct the survey. The members of the study team transferred their skills and knowledge of data collection to the extension officers. It is expected that not only the transfer of the skills and knowledge but also strengthening of the organization structure for monitoring and evaluation is necessary for this kind of cooperation in the future.

3.2.2 Evaluation of Umbrella Cooperation

The survey conducted in this study is intended to collect base-line data which will be the basis for evaluation of this cooperation. For this purpose, contents of the questionnaire is designed to cover the following items which are either direct or indirect evaluation indicators:

- | | | |
|-------------------------------------|------------------------|-------------------------------------|
| 1) Family | 2) Living Condition | 3) Cultivating Land Area |
| 4) Cultivation, Yield and Marketing | 5) Infrastructure | 6) Agricultural Equipment and Tools |
| 7) Agricultural Facility | 8) Labor | 9) Income |
| 10) Expenditure | 11) Farmers' Intention | |

Table 3.2.1 List of Selected Villages

Province	District	Sub-district	Village (Desa)	Village No.	No. of Farmer
1) South Sulawesi	Pinrang	Watang Sawito	Benteng	S01	20
			Mattirodeceng	S02	20
		Mattiro Sompe	Mattongeng	S03	20
		Cempa	Mattunru turu	S04	20
		Duampanua	Tatae	S05	20
	Sidrap	Duapitue	Tanrutedong	S06	20
			Ajubissue	S07	20
		Marutengnagae	Empagae	S08	20
			Kanyuara	S09	20
			Lautang Benteng	S10	20
2) West Java	Kuningan	Cigugur	Ci Santana	J01	20
		Darna	SagaraHiang	J02	20
	Bandung	Pasir Jambu	Tenjolaya	J03	20
		Ciwidey	Lebak Muncang	J04	20
			Alam Endah	J05	20
	Cianjur	Sukaresnii	Cikanyere	J06	20
		Pacet	Cipandawa	J07	20
			Cibodas	J08	20
	Sukabumi	Sukaraja	Langensari	J09	20
			Sukamaju	J10	20
3) West Nusa Tenggara	Sumbawa	Lape/Lopok	Lape	N01	20
			Lopok	N02	20
		Plampang	Labangka II	N03	20
			Labangka IV	N04	20
	East Lombok	Pringgabaya	Pringgabaya	N05	20
			Swela	N06	20
		Keruak	Jerowaru	N07	20
			Pemonkong	N08	20
	Central Lombok	Pujut	Rembitan	N09	20
			Truwai	N10	20
4) South Kalimantan	Tapin	Bakarang	Parigi Kercil	K01	20
		Candi Laras Selatan	Maranpiau	K02	20
		Binuang	Pantai Belanti	K03	20
	Banjar	Martapura	Panggalaman	K04	20
		Sungai Tabuk	Sungai Lutut	K05	20
		Gambut	Guntung Utung	K06	20
	Barito Kvara	Mandastana	Karang Indah	K07	20
			Karang Dunga	K08	20
		Tabunganen	Beringin Kencana	K09	20
			Tanggul Rejo	K10	20
Total No.					800

The major indicator of farmers' income which is the net agricultural income is obtained by subtracting the cost of agricultural production from total agricultural production. For agricultural production, the productivity was measured based on area of cultivation and

production of each crop. Also, the crop diversification was measured based on varieties of crops cultivated.

3.2.3 Results of Farm Household Survey

The details of this survey and the complete set of the survey results were attached with this report as APPENDIX E. The result of this survey was summarized below:

(1) South Sulawesi

Among the farm households selected for this survey, the average number of family members is 5.3 persons and men/women ratio is calculated as approximately 1:1. Family members' employment is surveyed as "Farming only 24%", "Farming and other 4%" and "Other only 6%". The diffusion rate of electricity is as high as 92%, however, 55% of households are still relying on wells without pump facility, as water source for their living. And the survey results of heat sources for cooking shows "Wood/Charcoal 54%", "Kerosene 17%" and "LPG/Electric less than 30%". The frequency of meat intake as an indicator for their dietary conditions revealed that majority (166 farmers; 83%) take meat 1 - 2 times/month. Regarding house condition, the results show that 77% of families surveyed are living in temporary or similar type of houses. For their possession of household appliances and vehicles, approximately 50% of the households are possessing TV sets, however, almost no household is possessing neither vehicles nor other type of appliances.

Regarding the condition of farm field, construction of farm road shows 67% of household have farm road access to some of their cultivating fields. But, it is suspected that the conditions of these roads need to be improved. The conditions of irrigation water seems to be fortunate as 69% of household answered enough through all the seasons and 25% answered enough only in the rainy season. For the possession of farming equipment, approximately 50% of household posses hand sprayers and winner. Apart from these equipment, not many farmers are possessed with other machinery except hand-tractors (25%), and it shows that mechanization of farming is not yet in progress. The result shows that 82% of households employ waged worker and utilize them for harvesting (28%), transplanting (25%), post-harvest practice (19%), tilling (15%) and transporting (10%). The average annual income for household is Rp 5,373,127 and 85% of this figure is from agricultural income. And

the average annual expenditure for household is Rp 3,334,449 and 36% of the figure is agricultural expenditure. The agricultural expenditure is 27% of the agricultural income.

(note: exchange rate at the time of the survey: US\$ 1 = Rp. 2,325)

In this surveyed area, rice is the major crop and survey results show all 200 farmers cultivate rice. The data shows that average rice cropping area for a household is 2.7ha; average yield is 5.2 tons/ha and 75% of the harvested rice is sold. Rice with any post-harvest treatment is only 9% of total production and improvement in this situation is expected. Besides rice, cacao, coconut and banana are produced. The production details of individual crop are given in the Table shown below:

Crop Summary for South Sulawesi

Crop	Count	Farmer %	Av. ha	Av. Harvest (kg)	Yield (Kg/ha)	Av. Sale (kg)	Sale %	P/Hvst. %
Paddy	200	100.0%	2.70	14,127	5,238.4	10,525	74.5%	9.1%
Cacao	38	19.0%	0.40	291	724.8	276	95.1%	65.8%
Coconut*	20	10.0%	0.33	796	2,417.9	690	86.8%	5.0%
Banana	13	6.5%	0.38	335	884.2	255	76.2%	7.7%
Mango	1	0.5%	0.40	1,500	3,750.0	1,000	66.7%	0.0%
Orange	1	0.5%	0.20	325	1,625.0	325	100.0%	0.0%
Wax Apple	1	0.5%	3.00	1,000	333.3	1,000	100.0%	100.0%
Mungbean	1	0.5%	0.80	400	500.0	400	100.0%	0.0%
Peanut	1	0.5%	0.30	600	2,000.0	400	66.7%	0.0%

Remark : Area for crops other than paddy are declared as garden area with extensive farming.

*Av.Harvest, Yield = unit

P/Hvst. % (Post-harvest %) is % of farmers applying post-harvest treatment for the crop

(2) West Java

Among the farm households selected for this survey, the average number of family members is 4.7 persons and the men/women ratio is calculated as approximately 1:1. Family members' employment is surveyed as "Farming only 40%", "Farming and others 10%" and "Others only 9%". The diffusion rate of electricity is as high as 98% in this area, however, 41% of households are still relying on wells without pump facility as water source for their living. And the survey results of major heat sources for cooking shows "Kerosene 67%" and "Wood/Charcoal 29%". The frequency of meat intake as an indicator for their dietary conditions resulted that 108 farmers (54% answered 1 - 2 times/week and 62 farmers answered 1 -2 times/ month. Regarding house condition, the results show that 63% of family are living in permanent type house, 32% are living in the temporary or similar type houses and 5% are living in temporary type housing. For their possession of household appliances and vehicles, 74% of households are possessing TV sets, however, almost no household is

possessing either vehicles or other type of appliances.

On the other hand, construction of farm road shows 88% of households have farm road access to some of their cultivating fields. The conditions are considered to be fortunate for this area. The conditions of irrigation water seems to be fortunate as 67% of households answered enough through the seasons and 19% answered enough only in the rainy season. For the possession of farming equipment, approximately 90% of household posses hand sprayers, however, the possession of other equipment are not observed in this area. The result shows that 90% of households employ waged workers and utilize them for harvesting (15%), transplanting (17%), post-harvest practice (5%), tilling (18%) and transporting (8%). The average annual income for household is Rp10,542,734 and 92% of the figure is agricultural income. And the average annual expenditure for household is Rp 8,709,474 and 60% of the figure is agricultural expenditure. The agricultural expenditure is 56% of the agricultural income.

In this surveyed area, variety of food crops and vegetables including snap bean, leek, tomato, chili and celery are cultivated. More than 97% of the production of these crops are sold and each year 12-18 tons of tomato, cabbage and Chinese cabbage are sold by the farmers. On the other hand, 72 out of 200 farmers are cultivating rice and average cultivating area is 0.5 ha with an average yield of 5.4 tons/ha. 81% of rice produced are sold. The production details of major crops are summarized in the Table shown below:

Crop Summary for West Java

Crop	Count	Farmer %	Av. ha	Av. Harvest (kg)	Yield (Kg/ha)	Av. Sale (kg)	Sale %	PIIvst. %
Paddy	72	36.0%	0.50	2,678	5,366.9	2,165	80.9%	18.1%
Snap bean	60	30.0%	0.48	5,518	11,592.5	5,510	99.9%	3.3%
Leek	54	27.0%	0.43	9,509	21,914.6	9,372	98.6%	5.6%
Tomato	51	25.5%	0.86	18,000	20,871.3	18,000	100.0%	2.0%
Chili	38	19.0%	0.37	3,418	9,224.4	3,414	99.9%	10.5%
Celery	38	19.0%	0.40	7,095	17,597.4	7,095	100.0%	0.0%
Chinese cabbage	36	18.0%	0.97	13,518	14,006.3	13,518	100.0%	0.0%
Carrot	34	17.0%	0.28	3,199	11,514.0	3,125	97.7%	2.9%
Potato	34	17.0%	1.05	4,223	4,020.2	4,146	98.2%	0.0%
Corn	30	15.0%	0.39	2,353	6,055.3	2,325	98.8%	6.7%
Cabbage	27	13.5%	0.69	12,122	17,644.2	12,122	100.0%	3.7%
Saisin	25	12.5%	0.21	1,636	7,652.9	1,633	99.8%	4.0%
Garlic	18	9.0%	0.25	1,614	6,587.3	1,614	100.0%	11.1%
Garden peas	15	7.5%	0.25	432	1,737.3	431	99.8%	20.0%
Cucumber	11	5.5%	0.22	1,894	8,504.1	1,886	99.6%	0.0%
Cauliflower	7	3.5%	0.20	4,257	21,531.8	4,257	100.0%	0.0%
Salad leaves	6	3.0%	0.18	2,403	13,451.5	2,378	99.0%	0.0%
Tea	6	3.0%	0.72	8,225	11,450.1	8,225	100.0%	0.0%
Cassava	5	2.5%	0.09	1,220	13,707.9	1,200	98.4%	0.0%
Red kidney bean	5	2.5%	0.23	1,170	5,043.1	1,170	100.0%	20.0%

Remark: Incomplete data are excluded

Crops less than 5 counts are not listed

PIIvst. % (Post-harvest %) is % of farmers applying post-harvest treatment for the crop.

(3) West Nusa Tenggara

Among the farm households selected for this survey, the average number of family members is 4.8 persons and men/women ratio is calculated as approximately 1:1. Family members' employment is surveyed as "Farming only 51%", "Farming and others 20%" and "Others only 17%". The diffusion rate of electricity in this area is low as 34% and 53% of households are still relying on wells without pump facility, as water source for their living. However, the results show that 40% of households are using public water supply. And the major heat sources for cooking is "Wood/Charcoal (94%)", and Kerosene is used by only 17% of households. Use of LPG/Electric has not yet been popular. The frequency of meat intake as an indicator for their dietary conditions resulted that majority (168 farmers) show 1 - 2 times/month. Regarding house condition, the results show that 83% of family are living in temporary or similar type house. For their possession of household appliances and vehicles, approximately 25% of the households are possessing TV sets, however, almost no household is possessing neither vehicles nor other type of appliances.

On the other hand, construction of farm road shows 77% of households have farm road access to some of their cultivating fields. However, it is suspected that the conditions of these roads need to be improved. Regarding the conditions of irrigation water, only 18% of households answered enough through the seasons and 80% answered enough only in the rainy season. This shows that the farming in this area is relied on rainfall as its water sources. For the possession of farming equipment, approximately 1/3 of household possess hand sprayers, approximately 1/2 of household possess winnower and approximately 1/5 of household possess cart or cattle wagon. Not many households possess any equipment other than these equipment, and it shows that mechanization of farming is not yet in progress. The result shows that 87% of household employ waged worker and utilize them for harvesting (21%), transplanting (23%), post-harvest practice (9%), tilling (21%), transporting (7%) and weeding (17%). The average annual income for household is Rp 1,513,888 and 71% of the figure is agricultural income. And the average annual expenditure for household is Rp 1,232,202 and 25% of the figure is agricultural expenditure. The agricultural expenditure is 29% of the agricultural income.

In this surveyed area, 69% of households are cultivating rice. The data shows that

average rice cultivating area for a household is very small (0.8ha) and the average yield is only 3.1 tons/ha. Besides rice, corn, soybean, chili and Mung bean are produced and approximately 90% of these crops have been sold. The rate of post-harvest treatment is 20% for rice, 16% for corn. The situation of production of each crop is summarized in the Table shown below:

Crop Summary for West Nusa Tenggara

Crop	Count	Farmer %	Av. ha	Av. Harvest (kg)	Yield (Kg/ha)	Av. Sale (kg)	Sale %	P/Hvst. %
Paddy	138	69.0%	0.79	2,453	3,105.1	1,624	66.2%	19.6%
Corn	90	45.0%	0.54	747	1,383.3	673	90.1%	15.6%
Soybean	80	40.0%	0.61	416	682.0	378	90.9%	12.5%
Chili	50	25.0%	0.49	658	1,342.9	648	98.5%	16.0%
Mung Bean	39	19.5%	0.70	294	420.0	292	99.3%	15.4%
Other Beans	19	9.5%	0.55	303	550.9	289	95.4%	15.8%
Banana	10	5.0%	0.23	89	387.0	69	77.5%	30.0%
Peanuts	9	4.5%	0.34	224	658.8	224	100.0%	11.1%
Coconut *	4	2.0%	0.50	195	390.0	173	88.7%	50.0%
Tabasco	4	2.0%	0.22	205	931.8	193	94.1%	50.0%
Sea Plant	3	1.5%		600		600	100.0%	0.0%
Shallot	3	1.5%	0.12	246	2,050.0	235	95.5%	0.0%
Egg plant	2	1.0%	0.25	21	84.0	20	95.2%	0.0%
Cashew nuts	2	1.0%	0.35	50	142.9	50	100.0%	0.0%
Soursop	1	0.5%	0.50	30	60.0	30	100.0%	0.0%
Pineapple	1	0.5%	0.50	2,800	5,600.0	2,800	100.0%	0.0%
Tomato	1	0.5%	0.25	150	600.0	125	83.3%	0.0%
Mango	1	0.5%	0.10	40	400.0	40	100.0%	0.0%

Remark : * Av. Harvest, Yield = unit

P/Hvst. % (Post-harvest %) is % of farmers applying post-harvest treatment for the crop

(4) South Kalimantan

Among the farm households selected for this survey, the average number of family members is 4.4 persons and men/women ratio is calculated as approximately 1:1. Family members' employment is surveyed as "Farming only 60%", "Farming and others 3%" and "Others only 36%". The diffusion rate of electricity for this area is low as 30%. Regarding water source for their living, use of river/spring is the main source with the household rate of 54%. The rate for other sources show 27% for well, 18% for rain water and only 1% for public water. And the major heat sources for cooking is "Wood/Charcoal" and it shows the household rate of 99%. The frequency of meat intake as an indicator for their dietary conditions resulted that majority (167 farmers;84%) show 1 - 2 times/month. Regarding the house condition, the results show that 97% of family are living in temporary or similar type houses. For their possession of household appliances and vehicles, approximately 1/2 of the households are possessing TV sets, however, almost no household is possessing neither vehicles nor other type of appliances.

On the other hand, construction of farm road shows 80% of household have farm road access to some of their cultivating fields. Regarding the conditions of irrigation water, 41% of household answered enough through the seasons and 59% answered enough only in the rainy season. This shows that the conditions of irrigation water in this area is relatively fortunate. For the possession of farming equipment, approximately 40% of household posses hand sprayers and winnower. Other than these equipment, not many are possessed with other machinery and it shows that mechanization of farming is not in progress yet. The result shows that 82% of household employ waged worker and utilize them for harvesting (33%), transplanting (34%), tilling (19%). The average annual income for household is Rp 2,522,395 and 65% of the figure is agricultural income. And the average annual expenditure for household is Rp 2,129,327 and 26% of the figure is agricultural expenditure. The agricultural expenditure is 35% of the agricultural income.

In this surveyed area, almost all households are cultivating rice. The data shows that average rice cultivating area for a household is relatively large (1.43 ha), however, average yield is low as 2.1 tons/ha. Besides rice, coconut (with household rate of 11%), orange (5%) and cassava (3.5%) are produced and approximately 80% of these crops have been sold. The rate of post-harvest treatment is 64% for rice. The production details of each crop is summarized in the Table shown below:

Crop Summary for South Kalimantan

Crop	Count	Farmer %	Av. ha	Av. Harvest (kg)	Yield (Kg/ha)	Av. Sale (kg)	Sale %	PHVst. %
Paddy	199	99.5%	1.43	3,045	2,135.5	2,148	70.5%	63.7%
Coconut *	22	11.0%	0.80	683	855.9	614	89.9%	0.0%
Orange	10	5.0%	0.62	3,844	6,177.4	3,524	91.7%	10.0%
Cassava	7	3.5%	0.25	3,029	12,254.3	2,600	85.8%	14.3%
Peanut	4	2.0%	0.18	124	678.1	96	77.8%	50.0%
Vegetable	4	2.0%	0.09	253	2,729.7	228	90.1%	0.0%
Banana	2	1.0%	0.30	180	600.0	175	97.2%	50.0%
Mung bean	2	1.0%	0.50	350	700.0	350	100.0%	50.0%
Rambutan	1	0.5%	0.50	7,000	14,000.0	7,000	100.0%	0.0%
Tangerine	1	0.5%	0.30	1,200	4,000.0	1,200	100.0%	0.0%

Remark : * Harvest, Yield = unit

PHVst. % (Post-harvest %) is % of farmers applying post-harvest treatment for the crop.

3.2.4 Results of Farmers' Intention Survey

The results of "Farmers' Intention Survey" are summarized below :

(1) South Sulawesi

Regarding the major problems in farming, 35% of the farmers answered "damage caused by insects, disease, rodent, bird or animal". Other problems which farmers pointed out are "too much production cost" and "problems of irrigation water". Regarding marketing of farm produce, the answers include "cheap selling price (29%)" and "middle-man who has the capital to keep the selling price low (24%)" as the major problems. Also, "seasonal fluctuation of selling price" and "unable to do proper treatment before selling" are pointed out. These answers show farmers' intention to improve the present situation in the future. Farmers' idea for increasing their farm income as shown in the answer include "expanding farming scale (35%)" and "adding value to produce by processing (33%)".

In order to expand their farm scale, the farmers answered "purchase the land (34%)" and "lease the land (34%)". The new crops to introduce include "rice (38%)", "poultry (15%)" and "Palawija (14%)" and these answers show that the farmers does not have idea of improving their present situation of established rice cultivation. 81% of the farmers answered that "capital" is the most limiting factor for expanding their farming scale. Besides this, "problems of production technique and marketing" are pointed out. Regarding suggestions for improved marketing system, "sell to intermediates at the farm (51%)" and "sell to processors directly (28%)" are pointed out. For improving the conditions of their farm field, the farmers want to "rehabilitate irrigation canal (47%)", "improve/construct access road (19%)" and "expand field (13%)". In case of using agricultural machinery, they want to use machinery for "tilling (36%)", "harvesting (24%)" and "transplanting (17%)".

The collected answers show that almost all farmers has the knowledge of Official Credit Services and 79% of the farmers have the experiences of utilizing those Services. As the request for the services, the farmers pointed out "simplification of application procedure (31%)", "lowering interest (30%)" and "raising limitation of debt amount (24%)". Regarding the request for agricultural extension services, the farmer point out "intensify the door to door technical service (23%)" and "supply information related to cropping (19%)". Besides these question, farmers also pointed out "increasing variety of demonstration plot", "teaching about know-how of farm management" and "improve skills/knowledge of extension worker".

(2) West Java

Regarding the major problems in farming, 33% of the farmers answered "damage caused by insects, disease, rodent, bird or animal". Also, 33% of the farmers answered "high production cost". Other major problem which the farmers pointed out is "bad seed quality/difficulty of obtaining high quality seed(14%)". Regarding marketing of farm produce, the answers include "cheap selling price (30%)", "middle-man who has capital keep the selling price low (24%)" and "seasonal fluctuation of selling price (24%)" as major problems. Farmers' idea of increasing their farm income is showed in the answer of "expanding farming scale (32%)", "introducing new crops/animals (28%) and "changing marketing method (25%)".

In order to expand their farm scale, the farmers answered "purchase the land (28%)" and "lease the land (39%)". Besides these answers, the farmers pointed out "cooperating with other farmers/cooperatives (28%)" which shows unique characteristics of the area. The new crops to be introduced include "vegetable (36%)" and "sheep/goat (19%)". 64% of the farmers answered that capital is the most limiting factor for expanding their farming scale. Besides this, "problems of production technique and marketing" are also pointed out. Regarding improving marketing system, "sell to intermediates at the farm (46%)", "sell to consumers directly at the market (18%)" and "sell to whole seller/retailer directly at market (18%)" are pointed out. For improving the conditions of their farm field, the farmers want to "rehabilitate irrigation canal (26%)", "enlarge/expand field (23%)" and "improve/construct access road (18%)". In case of using agricultural machinery, they want to use machinery for "tilling (32%)" and "transporting (24%)".

The collected answers show that the 78% of the farmers has the knowledge of Official Credit Services and 56% of the farmers have the experiences of utilizing the Services. As the request for the services, the farmers pointed out "lowering interest (40%)", "extending term (24%)", and "simplify application procedure (22%)". Regarding the request to the agricultural extension services, the farmer pointed out "supply of market price information (25%)" and "intensify the door to door technical service (21%)". Besides these questions, farmers also pointed out "supply of information related to the cropping (14%)", "improve skills/knowledge of extension worker (14%)" and "increasing variety of demonstration plot (11%)".

(3) West Nusa Tenggara

Regarding the major problems in farming, 28% of the farmers answered "too much production cost" and 27% of them answered "irrigation water". Also, 17% of the farmers answered "damage caused by insects, disease, rodent, bird or animal". Other major problems pointed out are "poor soil fertility (11%)" and "problems caused by natural environment (11%)". Regarding marketing of farm produce, the answers include "cheap selling price (28%)", "seasonal fluctuations in selling price (27%)" and "middle-man who has capital keep the selling price low (22%)" as the major problems. Farmers' idea of increasing their farm income is showed in the answer of "introducing new crops/animals (43%) and "expanding farming scale (30%)".

In order to expand their farm scale, the farmers answered "lease the land (50%)" and "purchase the land (35%)". Besides these answers, the farmers pointed out "cooperating with other farmers/cooperatives (14%)". The new crops want to be introduced include "Palawija (19%)", "rice (18%)", "cattle/meat (17%) and "Fruit (14%)", and this shows that they intend to introduce variety of crops/animals. 83% of the farmers answered that "capital" is the most concerning factor for expanding their farming scale. Besides this, "skill/technique for production" is also pointed out. Regarding improving marketing system, "sell to intermediates at the farm (51%)", "sell to consumers directly at the market (44%)" are mainly pointed out. For improving the conditions of their farm field, the farmers want to "rehabilitate irrigation canal (24%)", "enlarge/expand field (18%)" and "improve/construct access road (16%)". In case of using agricultural machinery, they want to use machinery for "tilling (42%)" and "harvesting (20%)".

The collected answers show that the only 50% of the farmers has the knowledge of Official Credit Services and 36% of the farmers have the experiences of utilizing the Services. As the request for the services, the farmers pointed out "lowering interest (42%)", "extending term (19%)", and "simplification of application procedure (17%)". Regarding the request to the agricultural extension services, the farmers point out "intensify the door to door technical service (37%)" and "supply of information related to the cropping (20%)". Besides these question, farmers also pointed out "increasing variety of demonstration plot (11%)", "teach about know-how of farm management/operation (11%)" and "supply of market price information (10%)".

(4) South Kalimantan

Regarding the major problems in farming, 27% of the farmers answered "the damage caused by insects, disease, rodent, bird or animal". Other problems pointed out are "too much production cost (23%)" and "problems of irrigation water (22%)". Regarding marketing of farm produce, the answers include "seasonal fluctuation of selling price (27%)", "middle-man who has the capital to keep the selling price low (25%)" and "cheap selling price (24%)". Farmers' idea of increasing their farm income is showed in the answer of "introducing new crops/animals (46%)" and "expanding farming scale (34%)".

In order to expand their farm scale, the farmers answered "purchase the land (48%)" and "lease the land (27%)". The new crops to introduce include "rice (30%)", "poultry (16%)", "cattle/meat (15%)" and "fruit (13%)". The 90% of the farmers answered that "capital" is the most concerning factor for expanding their farming scale. Regarding improving marketing system, "sell to intermediates at the farm (51%)" and "sell to consumers directly at market (29%)" are pointed out. For improving the conditions of their farm field, the farmers want to "rehabilitate irrigation canal (25%)", "improve drainage (23%)" and "improve/construct access road (22%)". In the case of using agricultural machinery, they want to use machinery for "tilling (39%)", "harvesting (21%)", "threshing (17%)" and "drying (10%)".

The collected answers show that the 79% of the farmers has the knowledge of Official Credit Services and 48% of the farmers have the experiences of utilizing the Services. As the request for the services, the farmers pointed out "lowering interest (27%)", "simplify application procedure (25%)", and "raising limitation of debt amount (20%)". Regarding the request to the agricultural extension services, the farmers pointed out "intensify the door to door technical service (30%)" and "increasing variety of demonstration plot (24%)". Besides these question, farmers also pointed out, "improve skills/knowledge of extension worker (18%)", "supply information related to cropping (12%)" and "teaching about know-how of farm management (10%)".