THE REPUBLIC OF INDONESIA

MINISTRY OF AGRICULTURE

THE STUDY
ON
IMPROVEMENT OF RICE POST HARVEST AND MARKETING IN FARMER GROUPS

ANNEX

OCTOBER, 1989

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

THE REPUBLIC OF INDONESIA

MINISTRY OF AGRICULTURE

THE STUDY
ON
IMPROVEMENT OF RICE POST HARVEST AND MARKETING IN FARMER GROUPS

ANNEX

OCTOBER, 1989

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

STUDY ON
IMPROVEMENT OF RICE POST HARVEST AND MARKETING IN FARMER GROUPS

FINAL REPORT

ANNEX

TABLE OF CONTENTS

ANNEX I

NATIONAL ECONOMY AND AGRICULTURE

STUDY ON
IMPROVEMENT OF RICE POST HARVEST
AND MARKETING IN FARMER GROUPS

ANNEX-I NATIONAL ECONOMY AND AGRICULTURE

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. SOCIAL AND ECONOMIC CONDITION

1.1 Land and Population

The Republic of Indonesia is the archipelago country consisting of about 13 thousand islands, of which land surface covers 1.92 million km^2. As of 1989 total population is 178 million and the annual population growth rate during 1980 to 1985 was 2.15%. Total labor force was 68 million, of which agriculture occupies 55.1%, and industry 8.2% in 1986. Unemployment was estimated at 2.6% (See Table I 1-1).

1.2 National Economy

Gross Domestic Product (GDP) in 1986 was Rp 96,489 billion ($58.3 billion). The per capita GDP was Rp 574 thousand ($348). Shares of GDP by industry was 25.8% for agriculture, 14.4% for manufacturing and 16.7% for commerce, respectively. During the 1983-1986 period, the annual growth rate of GDP was 3.2%, and annual growth rate of agricultural sector was 3.6%. About 75% of the agricultural GDP was produced in food crops sub-section, of which the essential crops are paddy, cassava, sweet potatoes, maize, and beans.

Indonesian economy has been suffering from severe setback since the early 1980s. The decline in the petroleum prices is the main causes. In fact, the petroleum product shared 86% of total export value in 1983, 66% of routine receipts of Government budget in 1984/1985.

Year	1970	1980	1981	1982	1983	1984	1985	1986	1987
Prices (US$/Barrel)	31.3	30.5	34.3	31.0	28.1	27.5	26.7	13.6	17.2

Source: World Bank, International Economic Department, 1988.

Annual growth rate of GDP dropped to 3.2% in 1983/1986 period from 7.9% in 1970/82 period. Under such circumstances, the current account deficit of the Government is increased to Rp 5,750 billion in 1986/87. Major part of the deficit were supplemented by the external finance assistances. In under to cope with the critical situation of said

national economy, the Government of Indonesia has been executing the following decisive measures. In fact, the annual growth rate of GNP increased to 5.0% in 1988 from 3.6% in 1987.

1) Reduction of Government Expenditure

The expenditure for development in 1986/87 were cut by 23% of the previous year's.

2) Increase of non-oil tax collection

Improvement of income tax collection and introduction of value-added tax and new simplified property tax system.

3) Devaluation of Rupiah by 31% in September 1986.

4) Relaxation of economic regulations

Deregulations on import and export (e.g. abolition of import monopoly in raw materials for chemicals and steel in 1988).

2. RICE PRODUCTION IN INDONESIA

2.1 Present Situation of Rice Production in Indonesia

Indonesia was one of the bigger rice-importers before, importing as much as 2 million tons of rice per annum in the last parts of 1970s.

However, the production rice, the staple food in Indonesia, had been successfully attained he self-sufficiency in 1985 and some 270 thousand tons of rice was exported in the same year. Recently, rice had to be imported in 1988 again since there has been no remarkable increases in rice production over, increasing demand caused by population increase. The total paddy production in 1986 was 39 million tons with 9.9 million ha of harvested area and 4.0 tons/ha of unit yield. The annual growth rate of rice production was estimated at 6.6% during the period from 1970 to 1984, while the growth rate declined significantly to 1.9% during the recent period of 1984 to 1986 (See Table I 2-1).

The rice production increase during 1970 to 1984 could be attributed to the following:

i) diffusion of high yielding technology package under BIMAS program such as high yielding varieties (HYV), fertilizers, agro-chemicals, credit system and extension services,

ii) increase in irrigated paddy fields, and

iii) stabilization of rice prices through the rice marketing control through KUD and DOLOG.

The followings are thought to be the causes of stagnation of rice production during the period from 1984 to 1986.

i) Rice has been fully respond to the technical package which is provided through BIMAS programme and being attained over the target yield.

ii) Low rate increase of the consolidation work on paddy fields and/or reclamation of irrigated paddy fields.

With high population growth rate of about 2.0% per year, there still exists the need to increase rice production to keep self-sufficiency in the future. Because the present increase rate of rice production, which is 1.9% per year, is less than that of population.

The profitability of paddy cultivation was substantially decreased by 10% from that in 1983. This is mainly because of a little increase in unit yields, and in contrast substantial decline of farm gate prices of rice and rise of labor wages. The financial balance of rice cultivation is summarized in table below and Fig. I 2-1. It is forecasted that the profitability of rice cultivation will be lowered further in the future due to the reduction/deletion of subsidies for agro-chemicals and fertilizers.

	1983	1984	1985	1986
Yield of wet land paddy (t/ha) (14% moisture content)	3.89	3.92	3.94	3.98
Consumer price index (1976=100)	239	264	277	292
Price of paddy (Rp/kg)	144	147	139	159
Price of paddy (1983 constant price) (Rp/kg)	144	133	120	130
Gross income ('000 Rp/ha)	560	578	548	633
Production cost ('000 Rp/ha)	162	152	171	191
Rate of reaping/threshing cost (%)	(no data)		7.0	6.6
Net return ('000 Rp/ha)	398	426	377	442
Net return (1983 constant price) ('000 Rp/ha)	398	426	325	362

Source: Central Bureau of Statistic, 1988
1) Statistic of Indonesia, 1987
2) Economic Indicator, 1988

2.2 Policy on Rice Production

Nevertheless the fifth 5-year plan (1989/90 - 1993/94) is still under preparation, the development policy and strategies are set force with particular attention to the following points according to a public speech of the President in Aug. 1988:

- Improvement of farmers' income and living standard
- Generation of employment opportunity and business chance
- Expanding of industry
- Promotion of export

Self-sufficiency in rice is the most important objective of the agricultural development policy. To increase the rice production, the following programmes have been taken as the essentials. 1) crop protection improvement, 2) water management improvement and conservation of land/soil against the erosion hazards, 3) improvement of post-harvest activities, farm management and marketing, and 4) promotion of agricultural extension services.

As an integrated rice production increase counter measure, the Government is now to promoting the SUPRA INSUS Program, a superintensive farming program for rice which started since the dry season cropping in 1987. The SUPRA INSUS is a program under which a higher technology package to a larger area is given to farmers through the mass guidance system. Wider areas with sound irrigation facilities under INSUS programme are the target areas of the SUPRA INSUS programme.

As for the improvement of post harvest activities, a saving of field operation losses should be made with emphases on an amendment/modernization of the operation practices as well as the facilities according to the suggestion stated in the president decree No. 47. Besides, the following programmes should also be scheduled so as to support the objective improvement of the post harvest activities.

- Organization of farmers for post harvest improvement
- Improvement of farm management
- Promotion of group farming
- Promotion of floor price system

Budget for the subsidy for fertilizers and agro-chemicals was curtailed in significant extent, even though subsidy is one of the most essential supporting services for rice production. The budget for subsidy was decreased from Rp 600 million in 1985, to Rp 200 million in 1986. In fact, the subsidies applied for fertilizer and agro-chemicals was obliged to be shortened in certain extents. The kinds as well as quantity of fertilizers/agro-chemicals are also limited under the said reduction of budget.

The rice price policy is implemented through buying of paddy by KUD, and operation of rice market through import and distribution of rice by DOLOG. Implementation of this policy is essential for promoting rice production as well as for social stabilization in urban areas. The following table shows the current prices of paddy and rice managed by DOLOG.

(Rp/kg)

	Paddy			Rice	
	Guaranteed Price (KUD's buying price)	DOLOG's Buying Price from KUD	DOLOG's Buying Price from Non-KUD	DOLOG's Buying Price from KUD	DOLOG's Buying Price from Non-KUD
1983/84	145	156.0	152.0	238	233
1984/85	165	177.7	172.7	270	264
1985/86	175	187.7	182.7	A class 318	310
				B class 285	279
1986/87	175	187.7	182.7	A class 318	310
				B class 285	279
1987/88	190	202.7	197.7	313	307
1988/89	210				

Source: Agriculture in Indonesia (AICAF)

Table I 1-1 PRINCIPLE ECONOMIC INDEXES IN INDONESIA

		1978	1979	1980	1981	1982	1983	1984	1985	1986
I. POPULATION AND LABOR FORCE										
1) Population	(million)	141.6	144.9	148	151.3	154.7	158.1	161.4	164.6	168.1
2) Labor force										
- Economically Active Population	(million)	*/1	52.7	52.4	60.8	*	*	*	63.8	70.2
Employed	(%)	*	96.8	98.3	97.3	*	*	*	97.9	97.4
Unemployed	(%)	*	3.2	1.7	2.7	*	*	*	2.1	2.6
- Employment by Industry	(%)	*	*	100.0	*	100.0	*	*	100.0	100.0
Agriculture	(%)	*	*	54.8	*	54.7	*	*	53.5	55.1
Manufacturing	(%)	*	*	8.5	*	10.4	*	*	9.1	8.2
Others	(%)	*	*	36.7	*	34.9	*	*	37.4	36.7
II. NATIONAL ECONOMY										
1) Gross Domestic Product (GDP)										
- GDP at Current Market Prices	(Rp. billion)	24,003	34,345	48,914	58,421	62,647	73,698	87,055	94,492	96,489
- GDP at 1983 Constant Prices /2		58,190	61,777	66,675	71,613	71,377	73,698	78,144	79,911	82,475
- Growth Rate	(%)	0	6.7	7.9	7.4	-0.3	3.3	6.0	2.3	3.2
- Per Capita GDP	(Rp. thousand)	170	237	331	386	405	466	539	576	574
	(US$)	413	380	528	600	585	469	501	509	348
2) GDP (1983 Constant) by Industry	(%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
- Agriculture		29.5	28.1	24.8	25.3	26.3	26.2	23.6	23.6	25.8
- Mining		19.2	21.8	25.7	24.0	19.6	19.3	18.3	16.2	11.1
- Manufacturing		10.6	10.3	11.6	10.8	12.6	12.5	12.9	13.5	14.4
- Commerce, Hotel,etc.		15.2	14.8	14.1	14.7	14.9	15.2	16.0	15.4	16.7
- Others		25.5	25.0	23.8	25.2	26.3	26.8	29.2	31.3	32.0
3) Price Index										
- Wholesale		100	146	190	210	225	260	284	314	314
- Consumer in 17 cities		100	135	156	175	192	215	237	248	263
4) Exchange Rate	(US$ 1.00=)	412	623	327	643	692	994	1076	1131	1649
5) Balance of Payment	(US$ million)									
- Export (F.O.B)		*	*	22609	23,665	19,747	18,689	20,754	18,527	14,396
- Import (F.O.B)		*	*	-13456	-16,542	-17,854	-17,726	-15,047	-12,705	-11,938
- Transportation and Travel (Net)		*	*	-2131	-2,684	-2,625	-2,422	-2,015	-1,717	-1,454
- Investment Income (Net)		*	*	-3048	-3,073	-3,030	-3,688	-4,016	-3,542	-3,221
- Government, n.i.e (Net)		*	*	-108	-146	-131	-86	-136	-125	-125
- Other Sevice (Net) *		*	*	-1112	-1,719	-1,565	-1,209	-1,465	-2,388	-1,767
- S.D.R		*	*	-65	-62	0	0	0	0	0
- Private Capital (Net)		*	*	-630	148	1639	1826	757	68	1291
- Loan/Grants (Net)		*	*	2079	1,910	4,099	4,743	2,819	1,695	3,026
- P.L 480		*	*	125	53	18	33	46	44	48
Total		*	*	2463	1,550	298	160	1,652	-143	266
6) Foreign Exchange Reserves	(US$ million)	2580	4145	6480	6,085	4,154	4,808	5,751	5,846	5,302
7) Export of Petroleum & Gas	(US$ million)	*	*	*	20,663	18,399	16,141	16,018	12,718	8,277

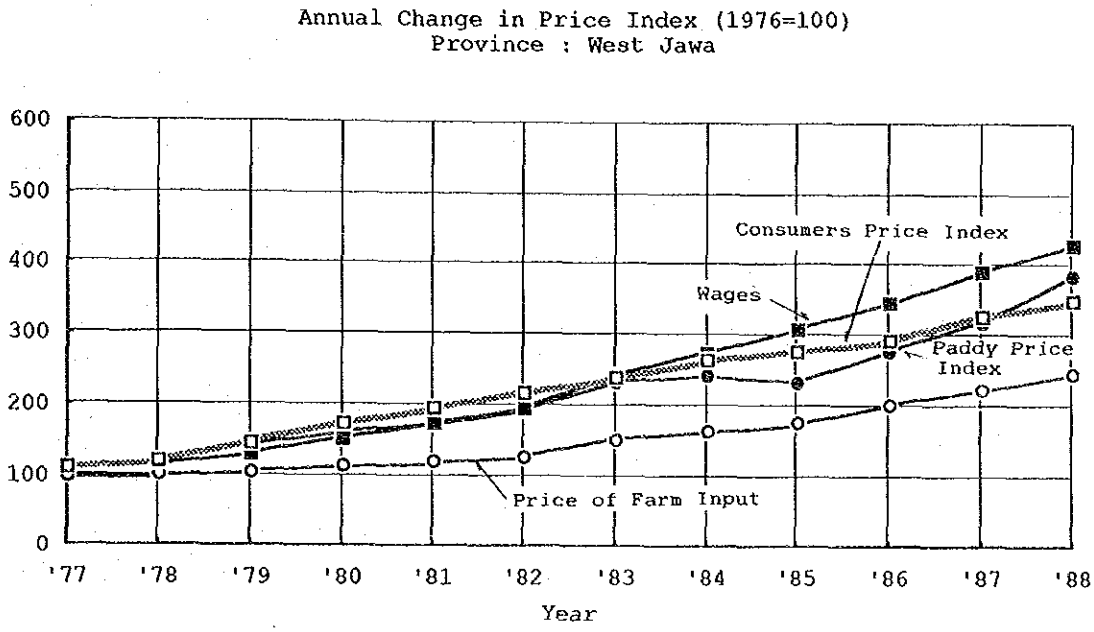
* : Not available

Source : (1) Statistik Indonesia 1985, 1986 and 1987, Biro Pusat Statistik.
(2) Indonesia, Strategy for Economic Recovery, World Bank, 1987.

Table I 2-1 RICE PRODUCTION IN INDONESIA

Year	Dry Land Rice			Wet Land Rice			Total		
	Area Harveted ('000 ha)	Yield (t/ha)	Production ('000 t)	Area Harveted ('000 ha)	Yield (t/ha)	Production ('000 t)	Area Harveted ('000 ha)	Yield (t/ha)	Production ('000 t)
1969	1,480	1.1	1,603	6,524	2.5	16,299	8,014	2.2	17,923
1970	1,457	1.1	1,620	9,994	2.6	17,555	8,122	2.4	19,184
1971	1,433	1.1	1,597	6,869	2.7	18,487	8,305	2.4	20,093
1972	1,303	1.2	1,497	6,635	2.7	17,974	7,942	2.5	19,471
1973	1,339	1.2	1,664	7,012	2.8	19,587	8,352	2.5	21,256
1974	1,178	1.2	1,426	7,309	2.7	20,911	8,498	2.6	22,360
1975	1,161	1.3	1,477	7,335	2.9	20,873	8,497	2.6	22,345
1976	1,141	1.3	1,451	7,241	3.0	21,700	8,382	2.8	23,160
1977	1,156	1.3	1,534	7,205	3.0	21,806	8,361	2.8	23,337
1978	1,227	1.3	1,596	7,642	3.1	23,900	8,869	2.9	25,512
1979	1,134	1.4	1,554	7,676	3.2	24,669	8,817	3.0	26,230
1980	1,205	1.4	1,722	7,791	3.6	27,630	8,994	3.3	29,364
1981	1,192	1.5	1,782	8,147	3.8	30,645	9,343	3.5	32,450
1982	1,126	1.6	1,807	7,913	4.0	31,685	9,034	3.7	33,499
1983	1,173	1.7	2,000	7,976	4.2	33,146	9,147	3.8	35,145
1984	1,214	1.7	2,113	8,488	4.2	33,729	9,706	3.9	37,861
1985	1,166	1.8	2,049	8,655	4.3	36,871	9,824	4.0	38,931
1986	1,087	1.8	1,957	8,797	4.3	37,383	9,884	4.0	39,339
1987									
1988									

Source: Ministry of Agriculture, 1988, Supply and Demand for Foodcrops in Indonesia



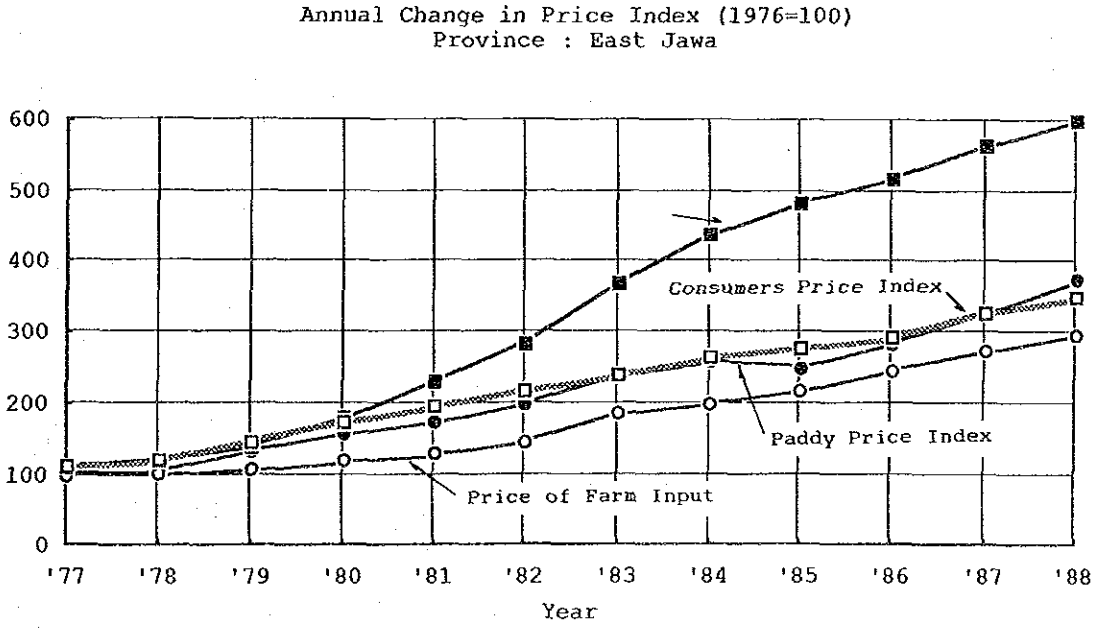


Fig. I 2 - 1 ANNUAL CHANGE IN PRICE INDEX

ANNEX II

SUPRA INSUS PROGRAM

STUDY ON
IMPROVEMENT OF RICE POST HARVEST
AND MARKETING IN FARMER GROUPS

ANNEX-II SUPRA INSUS PROGRAM

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. GENERAL

This Annex II is the supporting report representing the SUPRA INSUS PROGRAM with refard to the "Improvement on Rice Post Harvest and Marketing in Farmer Groups."

This report comprises the organization structure for the program execution, of SUPRA INSUS, the technology packages for the program, performance progress of the program at the national level as well as the Provinces and Kabupatens related to the study.

The data and information were mainly collected from the following government authorities concerned:

1) BIMAS Directing Board, Ministry of Agriculture (MOA)
2) Directorate of Food Crops Agriculture, MOA
3) Central Bureau of Statistics (CBS)
4) Agricultural Office, Province and Kabupaten
5) BIMAS Office, Province and Kabupaten
6) Rural Extension Center

2. PADDY INTENSIFICATION PROGRAM

2.1 BIMAS Program

BIMAS program (Bimbingan masal Swa Sembahan Makanan) under the government policy had been implemented on paddy since 1965/66 wet season. The program aims to increase rice production and to improve farmers' welfare through introduction of BIMAS technology package on paddy cultivation under integrated technical guidances with necessary farm inputs and credit services.

The intensification programs on rice cultivation under BIMAS were made through extension of the High Yielding Varieties (HYVs) developed by IRRI. Cultivation of HYVs requires much farm inputs such as fertilizers and agro-chemicals, hence, an arrangement of the credit services and subsidization of prices on farm inputs are essential. At the initial stage of said program, the credit repayments by the farmers and the supply

of farm inputs did not always play available on time. The government has been improving the systems on farm input supply and credit repayment.

At present, the commodities subjected to BIMAS program under BIMAS Directing Board are expanded to paddy, upland crops, horticultural crops, sugar cane, cotton, drought animals, goat and sheep, poultry, and fish culture.s

2.2 INSUS and SUPRA INSUS Program

Intensification programs implemented on paddy since dry season of 1979 were divided to two kinds of programs namely "general intensification (INMUM" and "special intensification (INSUS)". INMUM program was applied to intensification of individual farmer's productivity. On he other hand, INSUS program has been adopted to farmer groups organized at village level and promoted the group farming such as simultaneous cropping technology for successful attainment of pest control, water management and supply of certified seeds which INSUS program hardly expected to achieve.SUPRA INSUS program, a more advanced program than INSUS program, was stated since dry season of 1987.

The objective area of INSUS is 25 - 50 ha of the paddy field for one group faring while SUPRA INSUS Program covers 15,000 - 35,000 ha as a unit integrated existing farmer groups. Technology package under the INSUS is scheduled to apply each package A, B, C, or D. Among the packages, technical conditions of package D is same as SUPRA INSUS using plant growth hormone as for farm inputs. The essential difference between INSUS and SUPRA INSUS programs are summarized in Table II 2-1.

3. ORGANIZATION OF SUPRA INSUS PROGRAM

Each farmer group is headed by a key farmer. Key farmers in the working area of one extension worker (WKPP area) are organized as a basic unit for implementation of SUPRA INSUS program (Unit SUPRA INSUS; USI) covering 600 - 1,000 ha of paddy fields. Around ten (10) USI/WKPP areas are under the command area of one Rural Extension Center (REC/WKPP). Several WKBPP areas under one large irrigation system are integrated to a

unit SUPRA INSUS program area (Unit Himpunan) as shown in Fig. II 3-1. Major points of the guidance under the above units are summarized as follows:

1) Unit SUPRA INSUS (USI)

   a) implementation of optimum cropping pattern,

   b) rotation of paddy varieties for pests control and

   c) harvesting within 15 days so as to maintain more than one month of off-season period per year for preventing insect, pests and rodents.

2) Unit Himpunan SUPRA INSUS (UHSI)

   a) establishment of pests control system,

   b) effective irrigation water management and

   c) self-supply of certified seed.

Organization for SUPRA INSUS program has been established on the basis of BIMAS executing structures at Desa, Kecamatan, Kabupaten, Province, and National levels, respectively. The administrative coordination committee (POSKO) and working groups (POKJA) are organized to promote the efficient program execution. The farmers coordination committee was set up from the level of working area by one expansion worker to the national level. The working groups consisting of the government agencies concerned are coordinating to execute the programs effectively and to solve field constraints identified by the SUPRA INSUS coordination committee. The activities of the committees are shown in Tables II 3-1 and II 3-2.

The provincial government is substantially responsible for the execution of SUPRA INSUS program at provincial level assisted by agriculture office/BIMAS office. Each head of Province, Kabupaten, Kecamatan and Desa is responsible for the execution of the program at the respective level. The basic policy is decided by the central government (BIMAS office). The implementation plans at the level of Province, Kabupaten, Kecamatan and Desa are formulated by the respective SUPRA INSUS coordination committee, and are instructed to the farmers coordination committee.

4. SUPRA INSUS TECHNOLOGY PACKAGE

The technology package of SUPRA INSUS consists of the following ten (10) elements.

1) Optimum cropping pattern with annual cropping intensity of over 200%,

2) sufficient land preparation (twice of ploughing, once of puddling at least),

3) utilization of certified seeds (self-produced and certified in UHSI area),

4) rotation of varieties and unanimous variety by season,

5) high plant population density (more than 200 thousand hills/ha),

6) application of sufficient fertilizer,

   (N : 90 - 121 kg/ha, P_2O_5: 43 - 50 kg/ha, K_2O: 20 - 33 kg/ha,
   S : 0 - 24 kg/ha)

7) application of plant growth hormone such as cytozyme, atonic, hydrazil, dharmasri etc,

8) integrated control of insects, pests and rodents (proper application of insecticides and rodenticides, adoption of resistant varieties, maintaining of fallow period of more than one month/year),

9) proper water management (supply of sufficient water, sufficient drainage before harvest and drying of soil during fallow period), and

10) saving of post harvest losses (use of serrated sickles, use of sharp sickles, use of threshers, use of threshing curtains to prevent paddy from scattering, use of bags without holes and sufficient drying)

Basic farm input requirements of INSUS and SRPA INSUS are summarized in Table II 4-1.

5. PROGRESS OF SUPRA INSUS PROGRAM

Programed area under INMUM, INSUS and SUPRA INSUS in wet and dry seasons of 1988 is around 9,832 x 10^3 ha which is more than 99% to the preliminally estimation of paddy harvested area (9,875 x 10^3 ha). SUPRA INSUS and INSUS programs cover 57% and 22% of the total programed area

respectively. Paddy intensification program area in 1988 is summarized in Table II 5-1.

SUPRA INSUS programed area in 1988 is around 2,170 x 10^3 which accounts about 25% of harvested area of 8,718 x 10^3 ha. The realized area under SUPRA INSUS Program are shown in the following table. The realized area in dry season of 1988 and wet season of 1988/89 is limited to around 60% of the programed area.

(Unit: 1,000 ha)

1987 Dry Season	1987/88 Wet Season	1988 Dry Season	1988/89 Wet Season
287	339	674	566

Source: BIMAS office, 1989, Jakarta

SUPRA INSUS realized area in the objective four(4) provinces accounts more than 90% of Indonesia total area in 1987 and 1987/88, and still more than 70% in 1988 as shown in Table II 5-2.

There is no published data on unit yields of SUPRA INSUS for whole Indonesia. The following is the data in the objective four provinces obtained in CBS Jakarta:

(ton/ha)

	1987/88 Wet Season	1988 Dry Season
Karawang (West Java)	6.1	4.9
Nganjuk (East Java)	6.5	6.3
Pinrang (South Sulawesi)	5.8	5.8
Central Lampung	5.6	5.2

Source: CBS Jakarta

6. EVALUATION OF SUPRA INSUS FARMER GROUP

6.1 Profile of Farmer Groups

Farmer groups (Kelompoktani) are organized for promotion of improved farming technologies under Rural Extension Centers (BPP) in the survey

areas. For effective transfer of farming technologies, farmers are grouped plot by plot of paddy fields. Location of paddy fields owned by one farmer is sometimes scattered in several plots, hence there are cases of farmers who belong to two farmer groups. Duplicate participation in two farmer groups is mainly due to scattered land holding of farmers. This is one of the constraints for activation of organization.

Existing SUPRA INSUS farmer groups in the survey areas are evaluated by the ten (10) criteria as shown in Table VI 5-6. Classification and scoring of farmer groups comprise 1) beginner (0-250), 2) advance (251-500), 3) senior (501-750), and 4) excellent (751-1,000) as shown in Table VI 5-7. Evaluation results of SUPRA INSUS farmer groups in the pilot areas are shown in Tables II 6-1 to II 6-4 and summarized as follows :

Evaluation of SUPRA INSUS Farmer Groups

Classification	Telagasari	Bagor	Mattiro Bulu	Trimurjo
Beginner	0	6 (14%)	39 (32%)	0
Advance	55 (54%)	26 (59%)	75 (61%)	4 (8%)
Senior	44 (43%)	11 (25%)	7 (6%)	36 (68%)
Excellent	3 (3%)	1 (2%)	1 (1%)	13 (24%)
Total	102 (100%)	44 (100%)	122 (100%)	53 (100%)

6.2 Selected Farmer Groups in Survey Areas

SUPRA INSUS farmer groups for the pilot plan were selected by the evaluation results and the recommendation from Rural Extension Centers, the Kecamatan and Desa Offices. Most of these selected farmer groups are evaluated as for excellent, senior, or advance groups.

The selected farmer groups were arranged by a unit of tertiary irrigation block and listed as shown in Table II 6-5. These groups will be future objective farmer groups in order to expand pilot activities under the survey areas.

The study team selected pilot farmer groups among these selected groups on the basis of the following criteria:

- have typical problems in the paddy post harvest activities and marketing,
- have representative group works,
- have representative paddy field with typical irrigation facilities, and
- have the same tertiary irrigation block.

Pilot farmer groups selected in the survey areas are as follows:

Pilot Area/Name of Farmer Group	Scoring Value	Class	Pilot Area/Name of Farmer Group	Scoring Value	Class
1. Telagasari			3. Pinrang		
- Karya Tani	671	Senior	- Reso P I	793	Excellent
- Banyu Asih	720	Senior	- Reso P II	353	Advance
- Sri Mulya	584	Senior	- Reso P III	428	Advance
- Marga Mulya	535	Senior			
2. Bagor			4. Trimurjo		
- Boga Sembada	774	Excellent	- Krida K.II	798	Excellent
- Ringin Tunggal	665	Senior	- Panti Bogo	779	Excellent
			- Yoso Makmur	705	Senior

Composition of members in the selected pilot farmer groups is one group leader (key farmer), 5-10 progressive farmers and 25-214 common farmers (followers). Key farmers and progressive farmers mainly consist of land owners, while tenant farmers in Mattiro Bulu area account for around 44% of total progressive farmers. The share of tenants to total followers in the selected pilot farmer groups is estimated as follows :

Percentage of Tenant Farmers in Followers

(Unit: %)

Telagasari	Bagor	Mattiro Bulu	Trimurjo
39	84	100	0

Table II 2-1 DIFFERENCES BETWEEN INSUS AND SUPRA INSUS PROGRAM

Contents	INSUS	SUPRA INSUS
1. Unit of group farming area	Irrigated-paddy field under one farmer group (Kelompok Tani); ±25 - 50 ha	One Unit Himpuran SUPRA INSUS (UHSI): 15,000 - 35,000 ha USI/WKPP area of 600 - 1,000 ha.
2. Structure of decision making	a. Members meeting of each farmer group (±25 - 50 ha) b. Farm household of member farmers	a. Condition committed in UHSI (±25,000 ha) b. Coordination committee in USI WKPP (±600 - 1,000 ha) c. Members of farmer group/key farmer (+25 - 50 ha) d. Farm household of member farmers
3. Technology	Package A, package B, package C, and Package D	Package technology of SUPRA INSUS production (10 elements)
4. Location	Any area in where applied farmer groups are located	a. The province which has decided as SUPRA INSUS Program applied area by Minister of Department of Agriculture. b. The kabupaten in the selected province which has enough potential to execute SUPRA INSUS program.
5. Technical guidance to farmer groups	By field extension worker (PPL)	a. UHSI by subject matter specialist (PPS) b. USI/WKPP Key farmer groups by agricultural extension supervisor (PPUP)/chief of WKPP c. Farmer groups by field extension worker (PPL)

Table II 3-1 SUPRA INSUS COORDINATION COMMITTEE (POSKO) FOR GOVERNMENT ADMINISTRATION

Level	Chairman	Secretary	Member	Function	Activity	Meeting Frequency	Location
I Village (Desa)	Chief of village (Kepala Desa)	Secretary of village	Members of village BIMAS Task Force/ Executing Unit	Coordination for the program realization in village level and action for improvement	a) Monitoring of the program, b) Identification of problems, c) Action for improvement, d) Suggestion to Level II committee, e) Submission of implementation report to Level II, f) Supervision of Level A1 and A2, g) Preparation of minutes of meeting and submission to Level II, h) Promotion of credit repayment, i) Strengthening of linkage between KUD and farmer group	Once in two weeks	Village Office
II Sub-district (Kecamatan)	Chief of Sub-district (Camat)	Secretary of Sub-district	Members of Sub-disctrict BIMAS Task Force/Execut-ing Unit	Coordination for the program realization in Sub-district level	Same as Level I a) to c), d) Suggestion to Level III, e) Submission of report to Level III, f) Supervision of Level A3, B1 and I, g) Promotion of credit repayment	Once in two weeks	Sub-district Office
III District (Kabupaten)	Chief of District Food Crops	Secretary of District BIMAS Daily Executor	Members of District BIMAS Task Force/ Executing Unit	Coordination for the program realization in District level (Unit Himpuman Supra Insus) and action for improvement	Same as Level I (a) to (c), d) Suggestion to Level IV, e) Submission of report to Level IV, f) Supervision of Level B2 and II, g) Establishment of Working Groups (POKJA) in District level	Once in two weeks	District BIMAS Office
IV Province	Chief of Department of Agri-culture, Area Office	Secretary of Province BIMAS Daily Executor	Members of Province BIMAS Executing Unit	Coordination for the program realization in provincial level and action for improvement	Same as Level I a) to c), d) Suggestion to Level IV, e) Submission of report to Level V, f) Supervision of Level D and III, g) Establishment of Working Groups (POKJA) in provincial level.	Once in two weeks	Province BIMAS Office
V National	Chief of Food Crops Production, Directing Board and Horticul-ture/BIMAS Directing Board	BIMAS Directing Board	Members of BIMAS Directing Board	Coordination for the program realization in national level and action for improvement	a) Supervision of Level IV, b) Action for improvement	As required	Secretary Office of BIMAS Directing Board, Jakarta

Table II 3-2 SUPRA INSUS COORDINATION COMMITTEE (POSKO) FOR FARMER GROUPS ORGANIZATION (1/2)

Level	Chairman	Secretary	Member	Function	Activity	Meeting Frequency	Technical Supervisors
A1	Key Farmer	Secretary of farmer group (WILKEL)	Section chiefs of farmer group, Functional chiefs of FG (woman, youth, small farmer), one from KUD management board	Creation of farmers' consensus and cooperation for execution of the plan in farmer group	a) Arrangement of list of farmer participants (RDK) and list of farm inputs requirement (RDKK), b) Creation of farmers' consensus and execution of the plan, c) Consultation together with PPL covering variety schedule, seed source, credit repayment plan, marketing, participation to KUD, recording of farming activity, saving promotion.	Once in two weeks	PPL (Field extension worker)
A2	Chief of Key farmers' group in the working area for one field extension worker (WKPP)	Secretary of key farmer's group in one WKPP	All key farmers in one WKPP	Creation of consensus and cooperation among key farmers in one WKPP	a) Monitoring of the program in one WKPP, b) Recording of agri-cultural machine and equipment, c) Planning on supply of machines and tools and their cooperative use, d) Consultation with PPUP or chief of sub-district agricultural services (Mantri Tani) covering variety schedule, cropping pattern, water management, credit repayment plan.	Once in two weeks	Chief of BPP/ Agricultural extension supervisor (PPUP) on food crops
A3	Chairman of village unit cooperative (KUD)	Secretary of KUD	KUD management staffs, Members of KUD controlling board, chiefs of key farmers' groups in some WKPPs	Compilation of credit planning and repayment of credit, marketing service	a) Compilation of farmer groups' needs, b) Planning of farm inputs requirement and execution of credit service, c) Coordination with Level A1, A2 and B1, d) Planning of credit repayment, e) Promotion of participation to KUD	Once in two weeks	PPUP on food crops
B1	Chairman of chief key farmers' group (KTNA group) in the working area of one rural extension center (WKBPP)	Secretary of chief key farmers' group	Chiefs of some key farmers' groups in one WKBPP	Creation of cooperation for the program execution in one WKBPP	a) Monitoring of the program in one WKBPP covering cropping pattern, pest control, seed distribution, b) Recording of farm inputs procurement and credit distribution, c) Cooperation with private sector/KUD on farm inputs, credit and marketing, d) Coordination with Level A2, A3, B2, II and III committees, e) Promotion of credit repayment, f) Promotion of KUD development and services.	Once in two weeks	Chief of WKBPP

Table II 3-2 SUPRA INSUS COORDINATION COMMITTEE (POSKO) FOR FARMER GROUPS ORGANIZATION (2/2)

Level	Chairman	Secretary	Member	Function	Activity	Meeting Frequency	Technical Supervisors
B2	Representative of one or two chief key farmers' groups in one Unit Himpunan Supra Insus (UHSI)	Secretary of one or two chief key farmers' groups	Chiefs of some key farmers' groups in one UHSI	Creation of cooperation for the program execution in one UHSI	a) Monitoring of the program in one UHSI, b) Recording of distri-bution of farm inputs, credit, machine and equipment, c) Cooperation with other UHSI, private sectors/KUD, d) Coordina-tion with Level A3, B1, II and III committees, e) Planning of cropping pattern, f) Determination of seed growers, g) Monitoring on holding and lease of hand tractors and post harvest facilities.	Once in two weeks	Subject matter specialist (PPS), District
C	Representative of chief key farmers' groups in District level	Secretary of chief key farmers' groups in District level	Chiefs of key farmers' groups selected in District level	Coordination of the program execution in District level	a) Monitoring of the program in District level, b) Monitoring of agri-cultural machine and equipment, c) Coorperation with other UHSIs and private sector/KUD on farm inputs, credit, machine and equipment, d) Coordination with level B2, D and III, e) Promotion of KUD, development and services	Once in two months	Secretary of District BIMAS
D	Representative of chief key farmers' groups in provincial level	Secretary of chief key farmers' groups in provincial level	Chiefs of key farmers' groups selected in provincial level	Coordination of the program execution in provincial level	Same as Level B (a) to (e), (f) Promotion of credit repayment	As required	Chief of Agricultural Information Office (BIP)
E	Representative of chief key farmers groups in national level	Secretary of chief key farmers' groups in national level	Chiefs key farmers' groups in national level	Coordination of the program execution in national level	-	As required	Chief of Agricultural Executing Agency

Table II 4-1 FARM INPUT REQUIREMENT FOR PADDY INTENSIFICATION PROGRAM

Item	Unit Price	Insus						Insus & Supra Insus	
		Package A		Package B		Package C		Package D	
	(Rp/Kg/l)	Q'ty (kg,l/ha)	Amount (Rp/ha)	Q'ty (kg,l/ha)	Amount (Rp/ha)	Q'ty (kg,l/ha)	Amount (Rp/ha)	Q'ty (kg,l/ha)	Amount (Rp/ha)
1. Seed	450	25	11,250	25	11,250	25	11,250	25	11,250
2. Fertilizer									
- Urea	165	150	24,750	250	41,250	250	41,250	250	41,250
- TSP	170	100	17,000	100	17,000	125	21,250	125	21,250
- ZA	165		-		-	100	16,500	100	16,500
- KCl	165		-	75	12,375	100	16,500	100	16,500
3. Insecticide									
- Liquid	17,300	1	17,300	1	17,300	1	17,300	1	17,300
- Granular	1,500		-	17	25,500	21	31,500	21	31,500
4. Fungicide	92,500	0.3	27,750	0.3	27,750	0.3	27,750	0.3	27,750
5. Herbicide			18,000		18,000		18,000		18,000
6. Rodentcide	2,100	2	4,200	2	4,200	2	4,200	2	4,200
7. Growth Hormon	32,000		-		-		-	1	32,000
Total Farm Input			120,250		174,625		205,500		237,500
8. Spraying Cost (To buy sprayer)			2,500		2,500		2,500		2,500
9. Additional Land Preparation Cost			20,000		20,000		20,000		20,000
10. Processing Cost			10,000		10,000		10,000		10,000
Additional Cost			32,500		32,500		32,500		32,500
Total Cost			152,750		207,125		238,000		270,000

Source : Agricultural Intensification Program 1989/1990, BIMAS

Table II 5-1 PADDY INTENSIFICATION PROGRAM AREA IN 1988 AND 1988/89
(WHOLE COUNTRY)

Land/Program	1988 (Wet Season) (1000ha)	1988/89 (Dry Season) (1000ha)	Total Area (1000ha)	Total Composition (%)
I. Wet Land				
Supra Insus	858.0	1,312.0	2,170.0	23.7
Insus	1,701.8	3,665.5	5,367.3	58.7
Inmum	570.1	1,042.0	1,612.1	17.6
Total	3,129.9	6,019.5	9,149.4	100.0
II.Dry Land				
Insus	36.0	192.0	228.0	33.4
Inmum	80.8	373.5	454.3	66.6
Total	116.8	565.5	682.3	100.0
Total (I & II)				
Supra Insus	858.0	1,312.0	2,170.0	22.1
Insus	1,737.8	3,857.5	5,595.3	56.9
Inmum	650.9	1,415.5	2,066.4	21.0
Total	3,246.7	6,585.0	9,831.7	100.0

Source : Program intensifikasi pertanian, 1988/1989

Table II 5-2 TARGET AND REALIZATION AREA OF PADDY SUPRA INSUSU PROGRAM (1/2)
(BY PROVINCE)

Province		Target Area (1000ha) (I)	Realized Area (1000ha) (II)	Achieve-ment (%) (II/I)	With Credit Area /_1 (1000ha) (III)	With Credit Area (%) (III/II)
1.West Jawa	1987	270.0	270.8	100	50.3	19
	1987/88	343.4	245.5	71	42.9	17
	1988	316.3	302.2	96	76.8	25
	1988/89	369.0	373.0	101	123.6	33
2.East Jawa	1987	4.8	4.8	100	6.2	129
	1987/88	75.3	15.7	21	12.6	80
	1988	144.8	116.1	80	35.1	30
	1988/89	n.a	n.a	n.a	83.7	n.a
3.South Sulawesi	1987	7.0	6.7	96	23.1	345
	1987/88	64.7	36.4	56	91.2	251
	1988	48.1	47.1	98	68.9	146
	1988/89	n.a	n.a	n.a	n.a	n.a
4.Lampung	1987	0	0	0	2.7	
	1987/88	16.8	13.9	83	16.7	120
	1988	30.0	29.8	99	16.7	56
	1988/89	50.0	53.7	107	4.5	8
Total(1,2,3 & 4)	1987	281.8	282.3	100	82.3	29
	1987/88	500.2	311.5	62	163.4	52
	1988	539.2	495.2	92	197.5	40
	1988/89	n.a	n.a	n.a	n.a	n.a
Indonesia Total	1987	287.0	287.0	100	105.4	37
	1987/88	592.4	338.5	57	325.5	96
	1988	858.0	673.8	79	271.3	40
	1988/89	1312.0	566.0	43	n.a	n.a
3 season total		1,737.4	1,299.3	75	702.2	54
Share of above 4 provinces to total Indonesia(%)	1987	98	98			
	1987/88	84	92			
	1988	63	73			
	1988/89	n.a	n.a			

Note : /_1 ; Including other paddy intensification programs.
n.a ; Not available
Source : BIMAS, Jakarta

Table II 5-2 TARGET AND REALIZATION AREA OF PADDY SUPRA INSUS PROGRAM (2/2)
(BY KABUPATEN)

Province/ Kabupaten		Target Area (1000ha) (I)	Realized Area (1000ha) (II)	Achievement (%) (II/I)
1.West Jawa				
Karawang	1987	85.0	85.0	100
	1987/88	85.7	81.4	95
	1988	85.0	85.0	100
	1988/89	85.0	77.7	91
Subang	1987	65.0	63.8	98
	1987/88	75.0	68.2	91
	1988	75.0	65.3	87
	1988/89	75.9	14.9	20
2.East Jawa				
Nganjuk	1987	0	0	0
	1987/88	20.2	5.5	27
	1988	15.0	10.0	67
	1988/89	-	-	-
Banyuwangi	1987	0	0	0
	1987/88	0	0	0
	1988	15.0	15.0	100
	1988/89	-	-	-
3.South Sulawesi				
Sidrap	1987	6.7	6.7	100
	1987/88	21.0	20.5	98
	1988	16.0	25.3	158
	1988/89	-	-	-
Pinrang	1987	0	0	0
	1987/88	20.2	12.7	63
	1988	16.6	15.6	94
	1988/89	-	-	-
4.Lampung				
Lampung Tengah	1987	0	0	0
	1987/88	16.8	13.9	83
	1988	20.0	22.6	113
	1988/89	37.5	28.5	76

Source : BIMAS,Jakarta

Table II 6-1 SUPRA INSUS FARMER GROUPS IN TELAGASARI, 1988/1989

Name of Desa	Name of Farmer Groups	Total Score	Grade
1 Telagasari	1. Wargi Makar I	701	B
	2. Wargi Makar II	691	B
	3. Wargi Makar III	686	B
	4. Wargi Makar IV	681	B
	5. Wargi Makar V	716	B
2 Pasir Telaga	1. Wargi Saluyu I	701	B
	2. Wargi Saluyu I	696	B
	3. Subur Jaya	736	B
	4. Curugan	671	B
	5. Sri Mukti	756	A
	6. Sri Sugih	755	A
3 Caria Mulya	1. Mekar Jaya I	691	B
	2. Mekar Jaya II	706	B
	3. Tani Mukti I	696	B
	4. Tani Mukti II	761	A
	5. Dewi Sri	736	B
4 Talagamulya	1. Rawa Sari I	741	B
	2. Rawa Sari II	711	B
	3. Mekar Sari I	716	B
	4. Mekar Sari II	721	B
5 Kalibuaya	1. Citarum	480	C
	2. Jaya Sari I	499	C
	3. Jaya Sari II	272	C
	4. Cisadane	287	C
	5. Benong I	308	C
	6. Benong II	310	C
	7. IR 36	347	C
	8. Semeru	394	B
	9. Asahan I	554	C
	10. Asahan II	277	C
	11. Karya Tani I	360	C
	12. Karya Tani II	317	C
6 Kalibuaya	13. Mekar Jaya	413	C
	14. Tani Jaya	332	C
	15. Mekar Sakti	259	C
	16. *Lugina*	256	C
	17. Wargi Saluyu	348	C
7 Pasirkemuning	1. Salamjaya	450	C
	2. Astana Garib	634	B
	3. Sri Mukti	749	B
	4. Sri Rejeki I	443	C
	5. Sri Rejeki II	471	C
	6. Resep Makarya I	388	C
	7. Resep Makarya II	346	C
	8. Resep Makarya III	376	C
8 Pasir Mukti	1. Motekar	381	C
	2. Maggung Jaya	301	C
	3. Sumber Jaya	321	C
	4. Tegal Yaja	299	C
	5. Marga Jaya	386	C
	6. Jaya Laksana	490	C
	7. Daya Mekar I	592	B
	8. Daya Mekar II	699	B
	9. Ternak ayam buras	374	C
9 Kali Jaya	1. Saikhwan 1	476	C
	2. Saikhwan 2	296	C
	3. Saluyu 1	495	C
	4. Rukunwarga 2	747	B
	5. Rukunwarga 3	708	B
	6. Mekarjaya	511	B
10 Kalisari	1. Saluyu 2	570	B
	2. Karyatani 1	545	B
	3. Karyatani 2	540	B
	4. Karyatani 3	590	B
11 Kalisari	5. Karyatani 4	535	B
	6. Gemplosari 1	365	C
	7. Gemplosari 2	505	B
	8. Sawargi 1	680	B
	9. Sawargi 2	673	B
	10. Rukunwarga 1	560	B
12 Cadas K	1. Karyatani	671	B
	2. Banjuasih	720	B
	3. Tawekal	450	C
	4. Sukatani	645	B
	5. *Srimulyo*	584	B
	6. Saluyu	645	B
	7. Dewi Sri	406	C
	8. Marga Mulya	535	B
13 Cilewo	1. Tani Mukti	513	B
	2. Ariasih	475	C
	3. Sugih	420	C
	4. Sri Rejeki	733	B
	5. Sumberrejeki	582	B
	6. Sumber Jaya	462	C
	7. Sari Jaya	610	B
	8. Makmur	456	C
14 Lasan	1. Sri Jaya	438	C
	2. Makmur	423	C
	3. Lingkungsari	344	C
15 Ciwulan	1. Kedung Sagih	353	C
	2. Mekar Sari	398	C
	3. Sari Mukti	403	C
	4. Mukti Jaya	458	C
	5. Sugih Mukti	457	C
	6. Siwalem	375	C
	7. Dewi Sri	370	C
16 Pulosari	1. Tani Mukti	402	C
	2. Sari Jaya	438	C
	3. Sumber Tani	365	C
	4. Sari Asih	382	C
	5. *Lamparan*	375	C
	6. Sumber Sari	350	C

Note : A ; Excelent B ; Senior C ; Advance D ; Beginner

Table II 6-2 SUPRA INSUS FARMER GROUPS IN Bagor, 1988/1989

Name of Desa	Name of Farmer Groups	Total Score	Grade
1 Petak	1. Warga Tani	391	C
	2. Tani Makmur	486	C
2 Karang Tengah	3. Karep Mulyo	438	C
	4. Karya Tani	583	B
	5. Karya Basuki	455	C
3 Paron	1. Subur Makmur	428	C
	2. Tani Makmur	423	C
4 Kendalrejo	1. Sri Rejeki	670	B
	2. Kedung Rejeki	379	C
5 Bagor Kulon	1. Sandang Pangan	640	B
	2. Tani Mulyo	572	B
	3. Marsudi Tani	483	C
6 Ngumpul	1. Sumber Rejeki	389	C
	2. Sumber Pangan	347	C
7 Balongrejo	1. Rukun Tani	486	C
	2. Margo Rukun	428	C
8 Selorejo	1. Bago Sembodo	774	A
	2. Ringin Tunggal	665	B
	3. Suko Widodo	615	B
9 Buduran	1. Rukun Rahayu	380	C
	2. Rukun Makmur	437	C
10 Girirejo	1. Margo Mulyo	605	B
	2. Rejo Tani	349	C
	3. Margorejo	379	C
	4. Girirejo	438	C
11 Sekarputih	1. Tani Mulyo	415	C
12 Kerep Kidul	1. Tani Makmur	299	C
	2. Tani Muncul	295	C
13 Kutorejo	1. Rejo Tani I	379	C
	2. Rejo Tani II	246	D
14 Kedondong	1. Mardi Rukun	287	C
	2. Kedung Pangan	288	C
15 Gemenggeng	1. Makanan	661	B
	2. Karya Bakti	-	-
16 Sugihwaras	1. Sumber Mulyo	666	B
	2. Sumber Urip	498	C
	3. Sumber Waras	-	-
17 Banaran Wetan	1. Makarsari	239	D
	2. Gemanripah	666	B
	3. Martani	443	C
18 Baran Kulon	1. Beringin I	651	B
	2. Beringin II	437	C
	3. Beringin III	-	-
	4. Beringin IV	-	-

Note : A ; Excelent B ; Senior C ; Advance D ; Beginner

Table II 6-3 SUPRA INSUS FARMER GROUPS IN MATTIRO BULU, 1988/1989

Name of Desa	Name of Farmer Groups	Total Score	Grade
1. Alitta	1. Reso Tamanging	280	C
	2. Tejong Pamase	276	C
	3. Salamae	277	C
	4. Pallameang	202	D
	5. Lanrangnge	285	C
	6. Lura E	238	D
	7. Lika	297	C
	8. Mattaro Ada	267	C
	9. Salompang	297	C
	10. Lapakkita	267	C
	11. Lura E IB.	265	C
	12. Waru E	289	C
	13. Pajalele	279	C
	14. Sipurio	288	C
	15. Polejiwa	270	C
	16. Polewali	295	C
	17. Tanra Tallu E	457	C
	18. Rirennuang I	498	C
	19. T. Tallu E II	413	C
	20. T. Tallu E III	694	B
	21. Padaeolo	440	C
	22. Massiddi Ada E	410	C
	23. Siputuo	473	C
	24. Rinenuang II	460	C
	25. Labuangnge I	463	C
	26. Sipacnre	681	B
2. Manarang	1. Palaeolo I	392	C
	2. Mappasidapi E	469	C
	3. Rabba Sipatakong I	374	C
	4. Rabba Sipatakong I	231	D
	5. Makoli Lolo E	229	D
	6. Mattaro Ada E I	387	C
	7. Mattaro Ada E II	243	D
	8. Sipatuo I	346	C
	9. Sipatuo II	391	C
	10. Makkaritatu I	397	C
	11. Makkaritatu II	376	C
	12. Bukit Manerang I	485	C
	13. Bukit Manerang II	390	C
	14. Maminasa I	473	C
	15. Maminasa II	387	C
	16. Samaturu E I	472	C
	17. Samaturu E II	379	C
	18. Siporannu I	411	C
	19. Siporannu II	384	C
	20. Manasa Jaya I	576	B
	21. Manasa Jaya II	423	C
	22. Matutu E I	567	B
	23. Matutu E II	498	C
	24. Matutu E III	583	B
	25. Mukkaunu E I	436	C
	26. Mukkaunu E II	415	C
	27. Laopole I	397	C
	28. Laopole II	220	D
	29. Pattimperang I	224	D
	30. Pattimperang II	229	D
	31. Wella	220	D
	31. Pokuwali	222	D
3. Padakkalawa	1. Rirennuang I	302	C
	2. Rirennuang II	250	D
	3. Rabba Sepatakong	368	C
	4. Ada Gau I	300	C
	5. Ada Gau II	248	D
	6. Ada Gau III	248	D
	7. Mappa Maju I	302	C
	8. Mappa Maju II	250	D
	9. Mappa Maju III	250	D
	10. Pada Laba I	302	C
	11. Pada Laba II	253	C
	12. Pada Laba III	255	C
	13. Elo Dewada I	267	C
	14. Elo Dewada II	248	D
	15. Massanmaturu E I	370	C
	16. Massanmaturu E II	250	D
	17. Massanmaturu E III	250	D
	18. Mamanasa E I	363	C
	19. Mamanasa E II	250	D
	20. Mamanasa E III	250	D
	21. Mamanasa E IV	250	D
	22. Mamanasa E V	249	D
	23. Massiddi AdaE I	365	C
	24. Massiddi Ada E II	249	D
	25. Massiddi Ada E III	250	D
	26. Sabbana E I	351	C
	27. Sabbana E II	244	D
	28. Harapan Maju I	547	B
	29. Harapan Maju II	250	D
	30. Harapan Maju III	249	D
	31. Mali Siparappe I	565	B
	32. Mali Siparappe II	309	C
4. Marannu	1. Pammase Puang	251	C
	2. Reso Pammase I	793	A
	3. R. Pammase II	353	C
	4. R. Pammase III	428	C
	5. Sengian Seri	454	C
	6. Macinnae I	481	C
	7. Macinnae II	484	C
	8. RS. Temmangingi I	472	C
	9. RS. Temmangingi II	471	C
	10. RS. Temmangingi III	264	C
	11. Mat-Tunrue I	466	C
	12. Mat-Tunrue II	260	C
	13. Mat-Tunrue III	238	D
	14. Pallao Rume	478	C
	15. MN Madeceng	476	C
	16. Mattirowalie	462	C
	17. Mamminasa Ma Deceng	306	C
	18. Makkawarue	462	C
	19. Samarasa	461	C
	20. Elo Puang	216	D
	21. Sipatokkong I	209	D
	22. Sipatokkong II	211	D
	23. Sibangngareng	205	D
	24. Irannuangnge I	202	D
	25. Irannuangnge II	198	D
	26. Makkawarue	207	D
	27. Sipakainge	204	D
	28. Mamminasae	290	C
	29. Sipatuo I	293	C
	30. Sipatuo II	200	D
	31. Sipatuo III	156	D

Note : A ; Excelent B ; Senior C ; Advance D ; Beginner

Table II 6-4 SUPRA INSUS FARMER GROUPS IN TRIMURJO, 1988/1989

Name of Desa	Name of Farmer Groups	Total Score	Grade
1. Adi Puro	1. Rukun	464	C
	2. Ragam	729	B
	3. Remboko I	549	B
	4. Remboko II	574	B
	5. Adijaya	663	B
	6. Tani Maju	574	B
	7. Sidomakmur	627	B
	8. Karya Tani II	828	A
	9. Ngudi Makmur	773	A
2. Trimurjo	1. Trimakmur I	704	B
	2. Trimakmur II	721	B
	3. Trimakmur III	714	B
	4. Bina Karya I	729	B
	5. Bina Karya II	689	B
	6. Grawe Makmur	697	B
	7. Esti Mulyo	741	B
3. Liman Benaw	1. Karya Makmur	492	C
	2. Harapan Maju II	379	C
	3. Tunas Harapan	619	B
	4. Sidodadi	678	B
	5. Tunas Muda	664	B
	6. Gajah Putih	527	B
	7. Harapan Maju I	647	B
	8. Harapan Maju II	517	B
	9. Bina Bakti	771	A
	10. Lestari	780	A
4. Depok Rejo	1. Karya Tani	720	B
	2. Rukun Tani	563	B
	3. Trampil	537	B
	4. Harapan II	569	B
	5. Waluyo I	657	B
	6. Waluyo II	729	B
	7. Usaha Tani	820	A
5. Simbar Waring	1. Retno Widodo I	684	B
	2. Retno Widodo II	671	B
	3. Karya Maju	627	B
	4. Tani Maju	584	B
	5. Budi Daya I	585	B
6. Purwodadi	1. Yoso Makmur	705	B
	2. Krida Kismana II	798	A
	3. Panti Bogo	779	A
7. Tempuran	1. Sido Mukti	660	B
	2. Ngudi Makmur	692	B
	3. Suka Makmur I	657	B
	4. Suka Makmur II	574	B
	5. Setia Bakti	667	B
8. Notoharjo	1. Karya Makmur	463	C
	2. Taruna Bumi I	775	A
9. Untoro	1. Muda Karya	788	A
	2. Rukun Makmur	925	A
10. Pujo Asri	1. Karya Muda	785	A
11. Pujo Basuki	1. Kismosantoso	855	A
	2. Subur	752	A

Note : A ; Excelent B ; Senior C ; Advance D ; Beginner

Table II 6-5 SELECTED FARMER GROUPS IN PILOT AREA, 1988/1989

Pilot Area/ Name of Desa	Name of Farmer Groups	Area (ha)	No of Farmer
I. Telarasari			
1 Pasir Telaga	1. Wargi Saluyu I	25	32
	2. Wargi Saluyu I	25	30
	3. Subur Jaya	42	41
	4. Curugan	20	23
	5. Sri Mukti	22	26
	6. Sri Sugih	35	46
2 Caria Mulya	1. Mekar Jaya I	45	28
	2. Mekar Jaya II	64	58
	3. Tani Mukti I	47	34
	4. Tani Mukti II	55	55
	5. Dewi Sri	51	55
3 Talagamulya	1. Rawa Sari I	43	46
	2. Rawa Sari II	55	36
	3. Mekar Sari I	45	39
	4. Mekar Sari II	68	66
4 Cadas K	1. Karyatani	21	38
	2. Banjuasih	36	59
	3. Srimulyo	29	36
	4. Marga Mulya	33	39
5 Cilewo	1. Tani Mukti	24	45
	4. Sri Rejeki	51	46
	5. Sumberrejeki	39	37
	7. Sari Jaya	25	31
II. Bagor			
1 Kendalrejo	1. Sri Rejeki	17	24
	2. Kedung Rejeki	25	20
2 Bagor Kulon	1. Sandang Pangan	15	15
	2. Tani Mulyo	40	99
	3. Marsudi Tani	9	26
3 Selorejo	1. Bago Sembodo	40	138
	2. Ringin Tunggal	69	225
4 Sugihwaras	1. Sumber Mulyo	-	-
	2. Sumber Urip	-	-
5 Baran Kulon	1. Beringin I	-	-
	2. Beringin II	-	-
III. Mattiro Bulu			
1 Alitta	1. T. Tallu E II	19	56
	2. T. Tallu E III	13	33
	3. Labuangnge I	30	60
	4. Sipacnre	18	69
2 Manarang	1. Manasa Jaya I	45	34
	2. Manasa Jaya II	45	34
	3. Matutu E I	120	105
	4. Matutu E II	50	45
	5. Matutu E III	59	50
3 Padakkalawa	1. Mali Siparappe I	62	46
	2. Mali Siparappe II	39	42
4 Marannu	1. Reso Pammase I	60	58
	2. R. Pammase II	25	16
	3. R. Pammase III	20	13
IV. Trimurjo			
1 Depok Rejo	1. Karya Tani	40	31
	2. Rukun Tani	32	33
	3. Trampil	38	34
	4. Harapan II	34	37
	5. Waluyo I	49	33
	6. Waluyo II	42	35
	7. Usaha Tani	54	41
2 Simbar Waring	1. Retno Widodo I	34	113
	2. Retno Widodo II	33	86
	3. Karya Maju	51	90
	4. Tani Maju	43	88
	5. Budi Daya I	44	82
3 Purwodadi	1. Yoso Makmur	29	53
	2. Krida Kismana II	60	94
	3. Panti Bogo	68	107
4 Tempuran	1. Sido Mukti	53	72
	2. Ngudi Makmur	68	171
	3. Suka Makmur I	53	156
	4. Suka Makmur II	54	89
	5. Setia Bakti	58	75
5 Notoharjo	1. Taruna Bumi I	37	A
6 Untoro	1. Muda Karya	41	123
	2. Rukun Makmur	45	60
7 Pujo Asri	1. Karya Muda	35	31
8 Pujo Basuki	1. Kismosantoso	54	73
	2. Subur	65	54

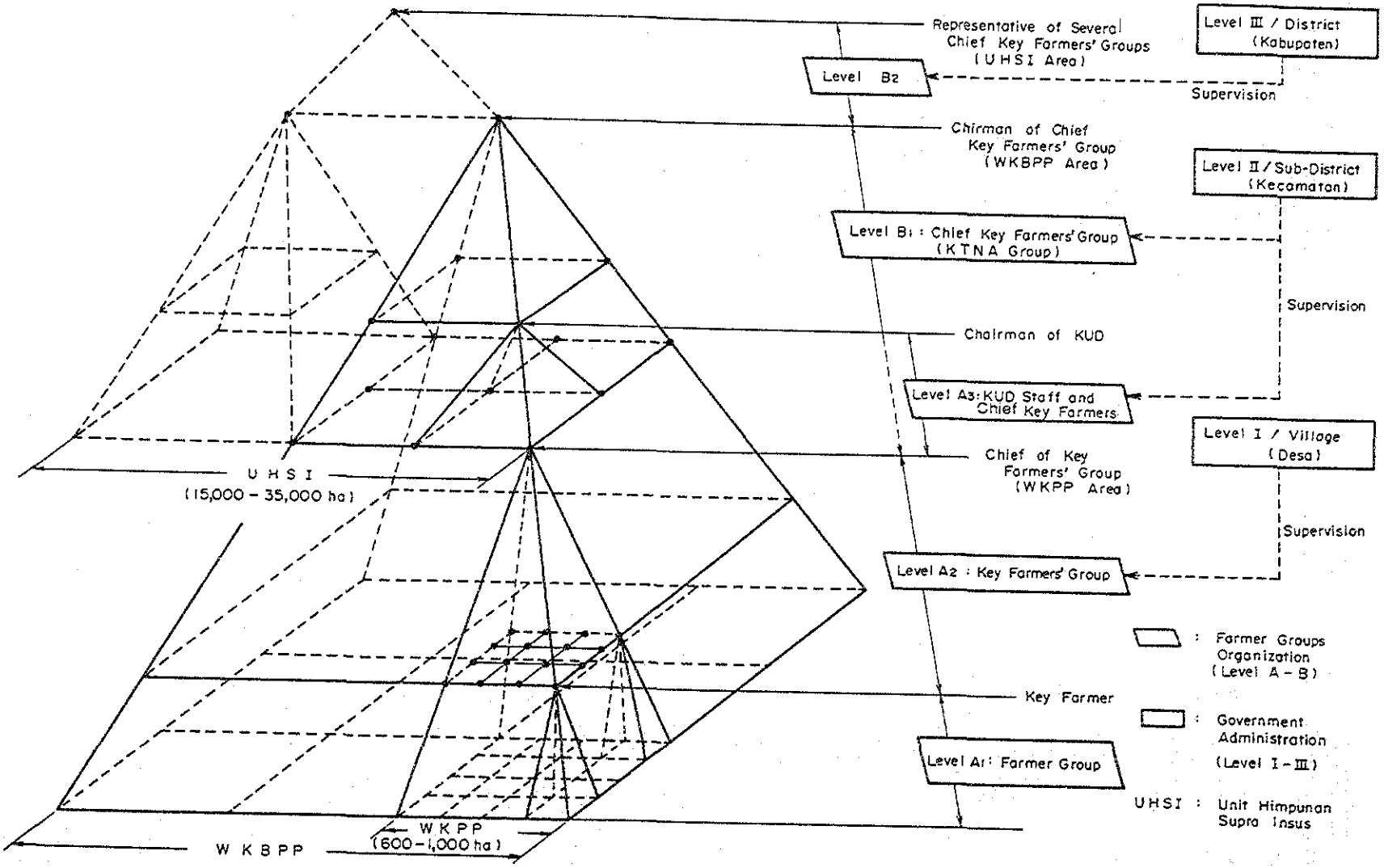


Fig. II 3 - 1 ORGANIZATION STRUCTURE OF SUPRA INSUS COORDINATION COMMITTEE

ANNEX III

RICE POST HARVEST AND MARKETING IN INDONESIA

STUDY ON
IMPROVEMENT OF RICE POST HARVEST
AND MARKETING IN FARMER GROUPS

ANNEX-III RICE POST HARVEST AND MARKETING IN INDONESIA

TABLE OF CONTENTS

LIST OF TABLES

1. PRESENT CONDITION OF PADDY POST HARVEST ACTIVITIES IN INDONESIA

1.1 Harvesting Systems in Indonesia

Harvesting systems prevailing in Indonesia are classified into the following four types :

(a) Gropyokan : Traditional paddy harvesting system in Indonesia: Any persons can take part in harvesting freely, labor wage is paid in kind by a certain share (1/9-1/6) to total harvest of each laborer.

(b) Ceblokan : Contract based harvesting system: Laborers who want to engage in harvesting work, should be subjected to do land preparation, transplanting, and/or weeding without any payment during the objective crop season. Wage is paid in kind same as Gropyokan, while wage rate is higher than Gropyokan (1/6-1/4).

(c) Tebasan : Selling paddy without harvest: Harvesting is done under management of buyer, i.e. middleman or broker.

(d) Harvesting by owner farmer or tenant farmer him/her-self.

1.2 Reaping and Heaping

Ani-ani a kind of cutters, was popular in harvesting by cutting only the panicles of paddy, in many places before. The reaping of stalk paddy by use of sickles is at present widely prevailing in the area where HYVs are introduced except a part of Java island and Sulawesi island where traditional varieties are still widely grown. This is because the way of reaping by sickles is more suitable for HYVs, which have short stalks, uniform-roping ears and shattering characteristics from view points of efficiency and saving losses. The reaping of panicle paddy by use of ani-ani requires the labour force 7 - 10 times more than that of

reaping by sickles and also caused much more field losses of gains because only matured panicles were reaped, selectively. The stalkes, of reaped paddy are dried under sunshine for less than a day in the field and then threshed in most cases.

However, in a part of Sumatera, the bounded paddy is heaped near the threshing place after sun drying, and is kept for 2 to 7 days. The reaped paddy is heaped in cone shape with a diameter of 2 - 4 m and a height of 1 - 2.5 m. This heaping is to prevent the rain water from coming inside the heap and to keep product from birds and animals. There is a possibility that the heaping may cause the colored paddy or germinating paddy when paddy is heaped with high moisture contents.

1.3 Threshing

There are four (4) methods to thresh paddy in Indonesia.

1) rubbing paddy with feet on a mat,
2) beating the wooden frame with paddy
3) thresher (manual/power), and
4) trampling the paddy panicles or to beat the panicles with a stick.

Among them the threshing by beating is predominant. The rubbing and trampling methods are for ear-reaped paddy in most cases. Custom threshing is spreading recently in North Sumatra and East Java to save rising labour costs and to prevent quality deterioration and losses caused by delaying manual threshing.

1.4 Cleaning and Drying

There is no cleaning process in most cases. Farmers remove only straw or foreign matters by hand. The paddy with foreign materials are sold to middlemen and millers.

The paddy is sold immediately after threshing with its moisture content of 17% - 18%, in most cases. In an area of South Sulawesi paddy

is dried on straw mats under sunshine until moisture content is reduced to be 14%. Generally the paddy bought by brokers, rice millers and KUDs for drying is spread in 5 - 6 cm thick on a concrete floor adjacent to a rice mill. The paddy dried in yards of a farmer's houses is sometimes cracked, because the paddy is spread in less than 1 cm thick on a mat in many cases and drying proceeds too fast.

Many surveys on post harvest loss of rice have been conducted. The survey by Central Bureau of Statistics in 1986/87 was the largest and most systematic. The number of samples was 4,200, and the result is shown in Table III 1-1. According to the data the total losses are estimated at as high as 19.54%, of which 75% were caused in the process of reaping and threshing. Accordingly, it is the most important to decrease the above-mentioned losses. The causes of the high ratio loss are considered as follows:

1) HYV has a shattering characteristics,
2) suitable reaping period of HYV is short,
3) reaping of wet season paddy meets with the wet season because of the prevalence of paddy double cropping,
4) reaping and threshing are conducted mainly by Gropyokan system, under which labors can get more paddy if they reap more paddy in certain limited period, so they don't care about losses, and
5) reaped paddy is often left for long time at fields in high moisture contents.

A survey on post harvest loss was conducted by JICA. According to this survey, the loss is very small, 3.6% in West Java, 8.4% in South Sulawesi.

1.5 Milling

Milling is done mechanically in most cases. Milling by pounding is very rare except very remote areas. Main parts of milling facilities are husker, paddy separator and whitener. There are 8 types of milling facilities as follows:

1) Steel huller (Engerberg type)

2) Rubber roll husker + steel huller

3) Rubber roll husker + friction type whitener with jet air

4) Rubber roll husker + screen type paddy separator + friction type whitener with jet air

5) Rubber roll husker + compartment-type paddy separator + friction type whitener with jet air

6) Rubber roll husker + compartment-type paddy separator + cone type whitener

7) Rubber roll husker + tray-type paddy separator + abrasive whitener

8) Rubber roll husker + tray-type paddy separator + abrasive whitener + friction type whitener with jet air

Out of above milling facilities, type 3) (one-pass type) is dominant, particularly consolidated type of type 3) is expanding. According to the ministry of agriculture, total milling capacity in Indonesia in 1987 were estimated at 31.3 million tons of per year. Small rice mills with the capacity of less than 0.7 ton (paddy)/hr covered about 60% of the total capacity.

Existing custom milling which processes about 1,300 tons of paddy per year on an average is seemed to be lucrative. Milling costs of one-pass type rice mill from Japan is estimated at Rp 8.83/kg (paddy) when 1,300 tons of paddy are processed. Actual milling charge are from Rp 20/kg to Rp 27/kg as shown in Table III 1-2. There are seemed to be little competition among millers.

According to the information from a seminar in rice milling technology of KUDs in February 1989, in Bogor, major problems in operation of the rice milling machinery given by ex-Kennedy round grant were:

1) expensive and limited supply of spare parts from a monopolized dealer (P.T. RUTAN)

2) necessity of modification of RMUs to make rice meeting BULOG's quality standard,

3) insufficient skill of rice mill operators,

4) insufficient working capital for the operation and,

5) insufficient usage of mills by KUD members due to limited operation of RMU.

Details of problems in individual KUD mills surveyed were given in Table III 1-3.

1.6 Quality Control

Paddy is sold mainly undried and uncleaned. It is very rare that farmer himself dry and clean the paddy before selling except large farmers who own rice mill.

The paddy quality deteriorates rapidly resulting in heating, rotting and germination when paddy is left fresh in high moisture contents. The farmers hope to sell their paddy as soon as possible after harvest. The moisture contents of the paddy and the contents of foreign matters, immature grain, yellow grain and red grain are not inspected in formal methods in dealing between farmers and brokers.

The prices at which KUD buys paddy from farmers are declared according to the quality as follows:

Item	Harvested in Fields	Before Storage	Ready for Milling
1. Moisture content (Max)	25%	18%	14%
2. Abortive grain and foreign matters (Max)	10%	6%	3%
3. Immature grain and blue grain (Max)	16%	8%	5%
4. Yellow grain and damaged grain (Max)	6%	5%	3%
5. Red grain (Max)	3%	3%	3%
Purchase Price from Jan. 1989 (Rp/kg)	175	210	250

Paddy for sales is dried under sunshine on concrete floors of a private rice millers or by dryers. KUD's dryers are not so intensively working. Therefore, the paddy is mostly dried on the concrete floors, and it often causes grains' cracking and deterioration by rain.

BULOG inspects the paddy quality when they purchase paddy through DOLOG according to their criteria. The standard quality on which BULOG purchase paddy/rice is shown below.

Standard Quality of Paddy (for domestic stock)

1. Quality Standard

   1) Paddy should not contain fungi and insects.

   2) Paddy should not have unpleasant or rotting smell.

   3) Paddy should not have harmful chemical materials by eyesight and chemical analysis.

2. Quality Standard

1)	Moisture contents	Max	14%
2)	Empty and foreign matters	Max	3%
3)	Yellow grain and damaged grain	Max	3%
4)	Green and chalky grain	Max	5%
5)	Reddish grain	Max	3%

Rice Standard (for domestic storage)

1. Quality Standard

1) Rice should not hold fungi and insects.

2) Rice should not have unpleasant smell or rotting smell.

3) Rice should not have rice bran and hull residuals.

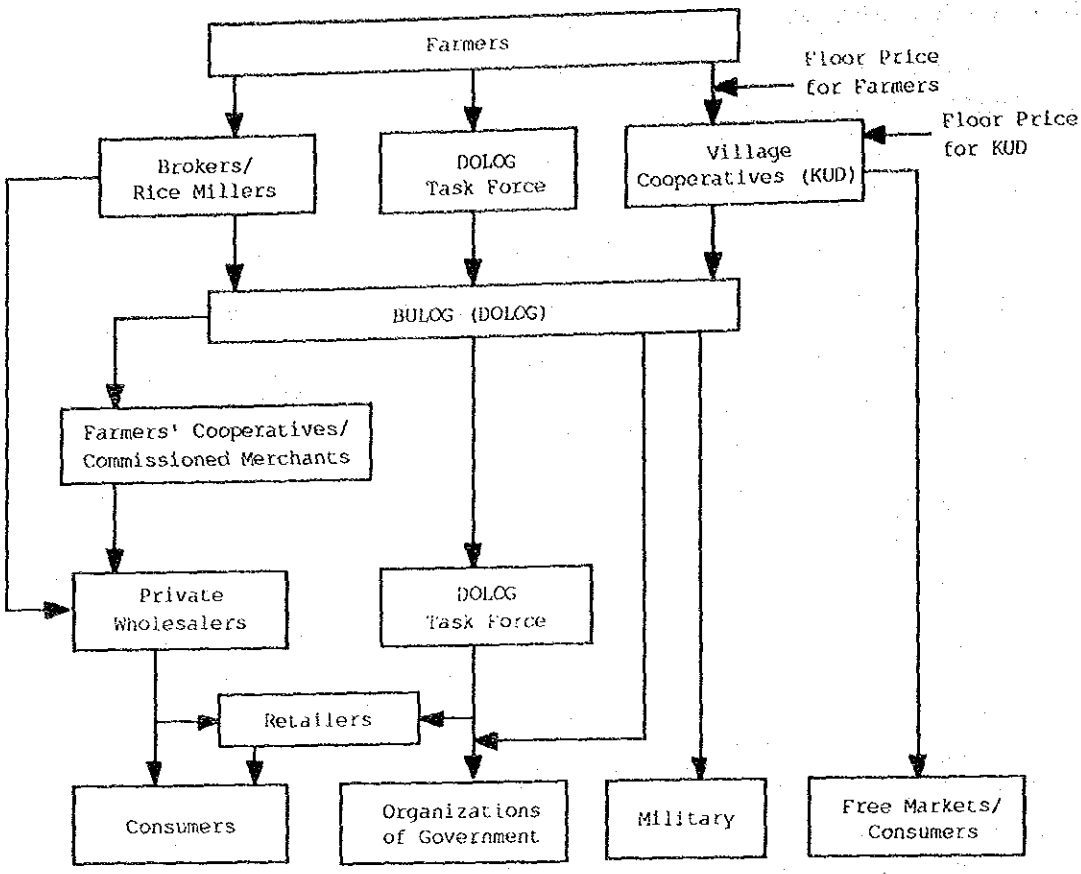
4) Rice should not have harmful chemical materials by eyesight and chemical analysis.

2. Quality Standard

Items		Quality	
		A Class	B Class
1. Moisture contents	Max	14%	14%
2. Milling degree	Min	100%	90%
3. Broken rice	Max	10%	35%
4. Small broken rice	Max	1%	2%
5. Chalky/greenish grain	Max	1%	3%
6. Damaged grain	Max	0.05%	3%
7. Reddish grain	Max	0%	3%
8. Foreign matters	Max	0.01%	0.05%
9. Unhusked grain (No.of grains/100 g)	Max	0%	2%

2. RICE MARKETING IN INDONESIA

The paddy produced by farmers are supplied to consumers through brokers, rice millers, BULOG, KUDs, wholesalers, and retailers as shown below.



The private merchants play great roles in collection in Desas, Kecamatans, Kabupaten and provinces and in distribution to consumers. Particularly in Kabupaten and level, Chinese merchants play big roles participating in urgent transportation of rice for DOLOG, in lease of warehouses to DOLOG making use of their own trucks or warehouses.

The KUDs, farmers' cooperative, play important roles in marketing of rice under the assistance of the government.

In the private marketing channel produced paddy is sold to brokers in fields or farmer's gate with direct transactions. The broker, whose marketing scale is mostly small, mill his collected paddy in small mills at villages or sell them to a large-scale urban merchants who owns his mills. Milled rice at village is consumed by farmers themselves or supplied to retailers according to demand and prices of rice.

Paddy is supplied from farmers mainly to KUD in case of the official channels. Some parts of the collected paddy is marketed through

private channels, and the remaining are collected to BULOG through DOLOG. Rice in BULOG is supplied to public officials, army and employees of governmental firms or stored as buffer stuck for stabilization of rice prices.

BULOG has an important function in stabilizing rice prices by export/importing of rice and selling of rice. BULOG dealed with 4.6% of rice produced in whole Indonesia in 1987/88 (See Table III 2-1), but the share of BULOG is decreasing year by year. It is forecasted that the private sector will continue to play an important role in the future.

Table III 1-1 RESULT OF POST HARVEST LOSSES, 1986/87 WET SEASON

Province	Losses (%)						Total Losses (%) to Product before Harvest
	Harvesting	Treshing	Trans-portation	Drying	Strorage	Milling	
Daerah Istimewa Aceh	7.25	5.63	0.52	0.91	0.12	2.97	16.38
Sumatra Utara	12.88	4.42	0.05	0.84	0.22	4.37	21.25
Sumatera Barat	15.77	5.07	0.06	2.22	0.42	4.12	25.40
Jambi	4.30	6.00	0.49	1.14	0.30	5.67	16.77
Sumatera Selatan	18.97	6.53	1.30	0.62	0.45	5.97	30.45
Lampung	8.40	6.54	0.58	3.72	0.24	4.52	21.95
Jawa Barat	8.42	5.37	0.74	2.47	0.26	2.49	18.40
Jawa Tengah	6.98	5.18	0.88	3.58	0.52	3.17	18.81
D.I. Yogyakarta	9.73	4.84	0.97	2.24	0.19	3.93	20.26
Jawa Timur	9.08	5.28	0.35	0.91	0.24	3.19	17.87
Bali	19.50	6.16	0.70	2.53	0.30	3.40	19.59
Nusa Tenggara Barat	7.38	6.82	0.59	3.01	0.20	3.86	20.17
Kalimantan Barat	2.47	2.79	1.35	3.39	0.28	3.12	12.70
Kalimantan Selatan	3.71	6.04	0.48	0.12	0.21	2.18	12.22
Sulawesi Selatan	6.66	5.54	0.52	0.81	0.26	3.89	16.61
I N D O N E S I A	9.19	5.48	0.59	1.94	0.32	3.51	19.54

Sourse: Central Bureau of Statistics, 1988
Paddy Post-harvest Loss Survey in 1986/87

Table III 1-2 STRUCTURE OF MILLING COST
(IN CASE OF SATAKE ONE-PASS MILL)

	Unit	Purchase Price	Replacement Ratio	Unit	Unit Cost
A.1 Machinery Cost					
-Mill	(Rp./unit)	2,900,000	10 years x 1,300ton/year	Rp/kg(paddy)	0.22
-Engine (23HP)	(Rp./unit)	3,350,000	8 years x 1,300ton/year	Rp/kg(paddy)	0.32
-Rubber Roll (4inch)	(Rp./unit)	29,000	40 hours x 0.5ton/hr	Rp/kg(paddy)	1.45
-Screen	(Rp./unit)	175,000	7,000hours x 0.5ton/hr	Rp/kg(paddy)	0.35
-Cylinder	(Rp./unit)	255,000	3,000hours x 0.5ton/hr	Rp/kg(paddy)	0.02
-Fuel	(0.3 lit. x 23 HP)/hr x Rp.225/lit./0.5ton			Rp/kg(paddy)	3.24
-Lubricant	(30% of fuel costs)			Rp/kg(paddy)	0.29
Total					5.89
A.2 Interest	2,900,000/2 x (1+0.15)^10/10 x 1,300,000				0.45
B. Labour Cost	Rp 90,000/head x 3headsx 12 month/1,300ton			Rp/kg(paddy)	2.49
A + B				Rp/kg(paddy)	8.83

EXISTING CUSTOM MILLING PRICES

		Price	Remarks
1. Nganjuk (East Jawa)	Rp/kg(Paddy)	20	3kg of rice per 100kg of paddy. Bran is given to millers. Rp425/kg(rice), Rp60/kg(bran)
2. Trimurjo (Lampung)	Rp/kg(Paddy)	27	10kg of rice per 150kg of rice. Bran is given to millers. Rp460/kg(rice), Rp60/kg(bran)
3. Sugih Mukti (West Jawa)	Rp/kg(Paddy)	20	Cash transaction

Source: interviews by present study team

Table III 1-3 MANAGEMENT PROBLEMS OF RICE MILLING UNITS AND RICE POLISHERS GIVEN BY EX-KENNEDY ROUND GRANT FOR KUDS (1/3)

No.	Name of KUD/ Regency/Province	Problems			Action had been taken by KUD	Suggestion Solution
		Technical	Economical	Social		
1 a	ACEH KUD Meurah Jaya Sub District: Meurendy Regency: Pidie	- No technical staff to be trained on RMU operating - Difficulties in getting spare parts	- Insufficient working funds for RMU operation - Insufficient Milling		- Trained existing operators based on their present experience - Substituted to local made part but in vain - Modified the RMU	- Necessary to train specialist operators - Establishing "SATAKE" dealer in eac province - To supply sufficient capitals - Needs technical guidance continuously
b	KUD Tufah Sub Dist.: Teunib Regency: Aceh Utara	Unavailability of spare parts		Insufficient participation of members to milling due to shortaged of milling capacity	- Repaired broken spare parts by welder or lather - Substituted the spare parts from another trader - Daily working plan arrangement	- To find out technician who have expert in spare parts - To arrange new equipments by sufficient spare parts - Need additional of 1 unit RMU with capacity 3 ton/hour
2 a	North Sumatra KUD Laguboti Timur Sub Dist.: Laguboti Regency: Tapanuli Utara	- Low skill of RMU operators - Difficulties in spare part purchasing	- Uncertainint of paddy stock	- Insufficient usage of RMU by local peoples/members	- Provided semi expert in mechanics, electrics - Provided local made spare parts - Expansion of covering areas - Formal and informal approach - Jointed wit another company	- To attend operator training courses - Providing spare parts of each regercy - Needs polic on spare parts management - Additional transportation facilities and working funds

Table III 1-3 MANAGEMENT PROBLEMS OF RICE MILLING UNITS AND RICE POLISHERS GIVEN BY EX-KENNEDY ROUND GRANT FOR KUDS (2/3)

No.	Name of KUD/ Regency/Province	Problems			Action had been taken by KUD	Suggestion Solution
		Technical	Economical	Social		
b	KUD Satahi Sub Dist.: Batang Angkola Regency: Tapanuli Selatan	- Low skill of operator and Ass. operator - Unavailability of spare parts	- Weak management of KUD, to get profits	- Insufficient participation of KUD members resulting in low operation rates of RMU (1 ton)	- Improved operator skill in cooperation with private rice mill - Purchased spare parts made by other manufacture - Increasd capitals - Purchased small scale RMU	- Applying for operator course - Applying for low interest/rate credit
3	WEST SUMATRA					
a	KUD Singkarak Sub Dist.: Sepuluh Kota Singkarak Regency: Solak	- Unskilled operator - Difficulties in getting spare parts - No-availability of mechanics	- High operation cost by members due to limited RMU operation - Low income by low RMU operation	- Insufficient usage by members due to limited RMU operation	- Provided skill-full operator for "GKL Batusangkar" - Case of studies of other RMU - Replaced with local made spare parts or modified the spare parts	- Applying for training course - Providing of sufficient spare parts - Providing operation manual
b	KUD Duku Batu Hampar Sub Dist.: Koto IX Tarusan Regency: Pesisir Selatan	- Low skill and low education level of operator - Spare parts are not avalable - Limited working capital - Dryer is damaged	- Low income due to low RMU operation	- Decreasing usage by members due to RMU troubles	- Trained operator even by limited capability - Replaced by local made spare parts - Used food purchasing budget of DOLOG	- Training of RMU operator - Pointing "PUSKUD" as a spare parts supplier - Obtaining sufficient working capital by buying more rice (Increase turnover rate of fund)

Table III 1-3 MANAGEMENT PROBLEMS OF RICE MILLING UNITS AND RICE POLISHERS GIVEN BY EX-KENNEDY ROUND GRANT FOR KUDS (3/3)

No.	Name of KUD/ Regency/Province	Problems			Action had been taken by KUD	Suggestion Solution
		Technical	Economical	Social		
4	LAPUNG	- Low capability and skill of operator - RMU ex Kennedy round is damaged	- Over usage of RMU (ex Kennedy round) resulting in low efficiency	- Low usage gy KUD members due to limited RMU operation	- Replaced wit Local made spare part - Trained operator	- Increasing special funds for RMU operation - Serving for small quality received by RMU 1/2 ton/hour
a	KUD Way Cambay Sub Dist.: Terbanggi Besar Regency: Lampung Tengah					
b	KUD Gotong Royong Sub Dist.: Gading Rejo Regency: South Lampung	- Low knowledge and skill of the operator - Unavailability of spare parts - Machine always out of work - Not dryer	- Limited capital for purchasing paddy seed - Insufficient dryer floor especially for rainy season - Unoptimum operation of RMU	- Low usage due to limited operation of RMU and limited capital of KUD limit capital cost of KUD	- Repaired of RMU - Purchased RMU 1/2 to capacity - Trained the operator	- Increase spare part stock - Purchasing tractor and transportation facilities - Add more RMU 1/2 ton/hour - Purchasing dryer or to extent the drying floor

Table III 2-1 BULOG DOMESTIC RICE PROCUREMENT

(Unit: milled rice)

Period/year	Java		Outer Islands		Indonesia		
	'000t.	%	'000t.	%	'000t.	%	% of Total Production
Repelita I: * (1969/70-1973/740)	268.0	76.8	81.0	23.2	349.0	100.0	2.60
Repelita II: (1974/75-1978/79)	418.0	75.5	136.0	24.6	554.0	100.0	3.45
Repelita III: (1979/80-1983/84)	1,098.6	77.0	327.4	23.0	1,426.0	100.0	6.65
Repelita IV:							
1984/85	1,766.2	74.1	616.0	25.9	2,382.2	100.0	9.18
1985/86	1,415.0	72.9	527.6	27.1	1,942.6	100.0	7.32
1986/87	1,034.6	69.1	461.7	30.9	1,496.3	100.0	5.54
1987/88	915.4	72.5	346.1	27.5	1,261.5	100.0	4.64

Source: BULOG 1988, Food/Rice Price Stabilization in Indonesia
Remark; * = 5 year Development Program

ANNEX IV

OUTLINE OF THE STUDY AREA

STUDY ON
IMPROVEMENT OF RICE POST HARVEST
AND MARKETING IN FARMER GROUPS

ANNEX-IV OUTLINE OF THE STUDY AREA

TABLE OF CONTENTS

LIST OF TABLES

1. GENERAL

To the objective study on "Improvement of rice post harvest and marketing in farmer groups", four provinces, which are generally accepted as the advanced rice producing regions in Indonesia, are primarily taken up as study areas. Besides seven representative Kabupatens in the said provinces are selected so as to intensify the objective study successfully.

Province (Study Area)	Kabupaten
1. West Java	1) Karawang 2) Subang
2. East Java	3) Nganjuk 4) Banyuwangi
3. South Sulawesi	5) Pinrang 6) Sidrap
4. Lampung	7) Lampung Tengah

Through the discussion with Directorate of Farm Management Development and Food Crops Processing and Provincial Agricultural Offices, the following 8 kecamatans are selected as preliminary survey areas:

Province	Kabupaten	Selected Kecamatan (Preliminary Survey Area)
1. West Java	Karawang	Telagasari
	Subang	Pagaden
2. East Java	Nganjuk	Bagor
	Banyuwangi	Rogojampi
3. South Sulawesi	Pinrang	Mattiro Bulu
	Sidrap	Maritengae
4. Lampung	Lampung Tengah	Trimurjo
		Seputih Raman

The selection of the preliminary survey areas is made with particular attention to the following conditions:

i. Preliminary survey areas are representative rice producing areas in the province.

ii. Problems of post harvest loss are recognized at present.

iii. Harvesting period of wet season rice coincides with the period of the second field work between March and April, 1989.

iv. Preliminary survey areas are progressive in irrigated rice farming.

v. Good cooperation can be obtained for ensuring smooth execution of the survey.

General condition and outlines in respective study areas are briefly discussed in the following sections placing a stress on the selected Kabupatens and Kecamatans.

2. WEST JAVA PROVINCE

2.1 Outline of the Study Area

West Java Province consisting of 24 Kabupatens, particularly the area close to the metropolitan Jakarta, is the most populated area in Indonesia. Karawang and Subang Kabupatens where the sample preliminary survey areas are located consist of 14 and 18 Kecamatans respectively. The selected preliminary survey areas are Telagasari Kecamatan in Karawang and Pagaden Kecamatan in Subang. Telagasari is located at about 70 km southeast of Jakarta and 110 km northwest of Bandung. Pagaden is located at about 160 km southeast of Jakarta and 60 km north of Bandung respectively. Both preliminary survey areas have been developed as one of major rice producing centers under the Jatiluhur Irrigation System.

The populations of Karawang and Subang in 1988 correspond to about 4% and 3% of total population of the West Java province respectively as shown in the following table. The population density is 992 km^2 in Telagasari and 824 km^2 in Pagaden as against the provincial average of 715. Both Kecamatans are considered as highly populated rural area in Indonesia.

The shares of farm households to the total households are 79% in Telagasari and 73% in Pagaden. Out of the farm total households, the

agricultural laborer's households share more than 40% in the preliminary survey area as shown in the following table:

(1988)

		Kab. Karawang		Kab. Subang		West Java
		Telagasari	Whole Kab.	Pagaden	Whole Kab.	
1. Area	(km^2)	50	1,753	85	1,864	46,300
2. Population/Household						
Total population	('000)	50	1,380	70	1,149	33,085
Household	('000)	13	225	14	21	4,389
Average family size	(Person/House)	3.9	4.2	3.7	4.0	4.1
Share of farm household	(%)	79	68	73	73	54
Population density	(Person/km^2)	992	787	824	616	715
3. Classification of Farm Household						
Owner farmer	(%)	38	21	52	28	51
Tenant farmer	(%)	21	31	5	15	11
Agricultural laborer	(%)	41	48	43	57	38
Total	(%)	100	100	100	100	100

See Table IV 2-1 and 2-3.

The share of agricultural sector to the gross regional domestic product (GRDP) is estimated at about 38% in Karawang and 39% in Subang. Per capita GRDP in agricultural sector is Rp 200 thousand in Karawang and Rp 290 thousand in Subang, respectively. Per capita GRDP of non-agricultural sector is around 3-5 times larger than that of agricultural sector.

(1987)

	Kabupaten					
	Karawang		Subang		West Java	
1. GRDP (10^9 Rp)						
Agricultural sector	275	(38%)	166	(39%)	4,068	(22%)
Non-agricultural sector	440	(62%)	256	(61%)	14,620	(78%)
Total	715	(100%)	422	(100%)	18,688	(100%)
2. Per Capita GRDP (10^3 Rp)						
Agricultural sector	199		290		226	
Non-agricultural sector	1,020		813		969	
Average	518		356		565	

See Table IV 2-2.

2.2 Agricultural Production

(1) Land Use

The share of paddy field to total area in Karawang and Subang is 55% and 47% respectively. As for the preliminary survey areas, the said share is 80% and 66% respectively for Telagasari and Pagaden.

(1987, km^2)

	Kab. Karawang		Kab. Subang		West Java
	Kec. Telagasari	Whole Kab.	Kec. Pagaden	Whole Kab.	
Paddy Field (Wet land & dry land)	40 (80%)	972 (55%)	56 (66%)	885 (47%)	13,500 (29%)
Total Area	50 (100%)	1,753 (100%)	85 (100%)	1,864 (100%)	46,300 (100%)

See Table IV 2-3

In Telagasari area, the double cropping of paddy is full practised and then the cropping intensity is around 200% in the entire paddy field of 4,000 ha. Palawija crops such as soybean, maize, tuber crops and vegetables are also planted using the off-season between dry and wet seasons, while the planting area is still limited. In Pagaden area cropping intensity is 100% in wet season and 80% in dry season.

(2) Land Holding

The following table shows the average holding size of paddy field in preliminary survey areas. The average holding size of paddy field of owner farmers is estimated at 2.1 ha for Karawang and 1.5 ha for Subang, respectively. These size are far larger than the provincial average of 0.6 ha. The holding size by rice producing farmers including both owner and tenant farmers is 0.7 ha in both Telagasari and Pagaden, while provincial average is 0.5 ha.

(Unit: ha/Farm Household)

Item	Kab. Karawang		Kab. Subang		West Java
	Kec. Telagasari	Whole Kab.	Kec. Pagaden	Whole Kab.	
Owner Farmer	1.0	2.1	0.8	1.5	0.6
Owner and Tenant	0.7	0.8	0.7	1.0	0.5
Total*	0.4	0.4	0.4	0.4	0.3

*: Owner, tenant and agricultural laborers
See Table IV 2-4.

(3) Agricultural Production

The average yield of paddy in Karawang and Subang Kabupatens is 5.2 t/ha and 5.0 t/ha, respectively, while the provincial average is fairly low at 4.5 t/ha according to the data in Central Bureau of Statistics in 1987.

Telagasari and Pagaden where double cropping of paddy is practised under advanced irrigation services of Jatiluhul irrigation system have achieved higher yield of 6.8 t/ha and 5.9 t/ha respectively as shown in the following table:

(1988 Estimation)

	(Unit)	Kab. Karawang		Kab. Subang		West Java
		Kec. Telagasari	Whole Kab.	Kec. Pagaden	Whole Kab.	
1. Harvested area	(10^3 ha)					
Wet land paddy		8.0	187	9.5	159	1,905
Dry land paddy		-	(0.3)	0.8	(2.8)	132
Total		8.0	187	10.3	162	2,037
2. Production	(10^3 t)					
Wet land paddy		53.2	972	55.9	803	8,973
Dry land paddy		-	(0.8)	2.0	(7.0)	290
Total		53.2	973	57.9	810	9,263
3. Average Yield	(t/ha)					
Wet land paddy		6.8	5.2	5.9	5.1	4.7
Dry land paddy		-	(2.7)	2.5	(2.5)	2.2
Total		6.8	5.2	5.6	5.0	4.5

See Table IV 2-5.

2.3 Agricultural Support System

There are 209 rural extension centers (WKBPP) in West Java Province. One extension center covers 2 Kecamatans on the average. In case of Karawang and Subang Kabupatens there is an extension center in most Kecamatans. Major activities of extension centers are to extend the modern farming technology, to promote the organization of farmer groups and to assist the arrangement of agricultural credit service, especially for procurement of farm inputs. Number of extension workers in a center is 12 to 16.

SUPRA INSUS Program has been implemented in all of Kecamatans in Karawang and Subang Kabupatens. There are 12 Unit Himpunan Supra Insus (UHSI) in the province, out of which 4 in Karawang and 3 in Subang. The harvested area of paddy under SUPRA INSUS is more than 80% of the total paddy field in both Kabupatens. The provincial average is as small as 29%. Area of irrigated paddy field included in a UHSI is 21 to 23 thousand ha in both Kabupatens, while the provincial average is 25 thousand ha.

Item	Kab. Karawang	Kab. Subang	West Java
1. No. of Kecamatans	14	18	453
2. Rural Extension Center (WKBPP)			
a. Total No.	12	13	209
b. No. of WKBPPs per Kec.	0.9	0.7	0.5
3. No. of Extension Workers (Food Crops)			
a. Total No.	144	184	3,384
b. No. of PPL per Kec.	10	10	7
c. No. of PPL per WKBPP	12	14	16
4. SUPRA INSUS Program			
a. No. of Target Kecamatan	14	18	-
b. No. of WKBPP under SUPRA INSUS	12	13	-
c. No. of UHSI	4	3	12
5. Area under SUPRA INSUS (paddy field)			
a. Harvested area under SUPRA INSUS (10^3 ha)	166.4	133.5	548
- 1987/88 (Wet season)	81.4	68.2	246
- 1988 (dry season)	85.0	65.3	302
b. Total Paddy Harvested Area (10^3 ha) (Wet season, dry season)	187.0	159.0	1,905
c. Share of area under SUPRA INSUS (%) (5a/5b)	89	84	29
d. Harvested area per UHSI (10^3 ha) (5a/4c)	41.2	44.5	44.7
e. Paddy field per UHSI (10^3 ha)	21.3	22.7	25.2

Telagasari rural extension center in Karawang covers Telagasari Kecamatan and the neighboring Kecamatan of Lemahabang. Gunungsembung extension center located in Pagaden also covers Gunungsembung Kecamatan and the neighboring Kecamatan of Cipunagara. Telagasari and Pagaden Kecamatans are under UHSI No.IV and No.X respectively. Areas of paddy field in both extension centers under SUPRA INSUS program is as summarized below:

Item	1987/88 (Wet season)	1988 (Dry season)	Total
1. Kab. Karawang			
a) Area under UHSI (IV) (10^3 ha)	26.0	26.0	52.0
b) Area under WKBPP Telagasari (10^3 ha)	7.7	7.7	15.4
c) Rate (b/a) (%)	30	30	30
2. Kab. Subang			
a) Area under UHSI (X) (10^3 ha)	20.8	21.4	42.2
b) Area under WKBPP Gununsenbun (10^3 ha)	9.6	9.8	19.4
c) Rate (b/a) (%)	46	46	46

3. EAST JAVA PROVINCE

East Java province is one of the major rice producing areas in Indonesia. The annual rice production of this province shares about 19.4% of the total rice production of Indonesia in 1986. The annual growth rate of rice production was about 2.29% during 1982 and 1986, while it declined to 1.31% in 1986.

3.1 Outline of the Study Area

The East Java province consists of 29 Kabupatens and 8 Kotamadya (municipality). The preliminary survey areas are located in Nganjuk and Banyuwangi Kabupatens which are located at about 35 km southwest and 25 km southeast of Surabaya, the capital of East Java province, respectively.

Kecamatan Bagor in Kabupaten Nganjuk, selected as the preliminary survey area, is a part of Brantas River Irrigation Development Area. Kecamatan Rogojampi is also taken up as the subjected preliminary survey area. This Kecamatan lies in apart of Pekaran Sanpian Irrigation Area.

The population of the East Java province is about 32.6 million as of 1986, of which Nganjuk and Banyuwangi occupy 2.9% and 4.3%, respectively. The population density of the province is estimated at about 680 persons/km^2, while those of Bagor and Rogojampi are as high as 990 persons/km^2 and 1,144 persons/km^2, respectively.

(1988 Estimation)

Item		Kab. Nganjuk		Kab. Banyuwangi		
		Kec. Bagor	Whole Kab.	Kec. Rogojampi	Whole Kab.	East Java
1. Area	(km^2)	52.0	1,183	73.4	5,783	47,922
2. Population/Household						
Total population	(10^3)	51	953	84	1,402	32,607
Household	(10^3)	12	221	23	351	7,764
Average family size	(person/house)	4.3	4.3	3.7	4.0	4.2
Share of farm household	(%)	92	79	70	70	69
Population density	(person/km^2)	981	806	1,151	242	680

See Table IV 2-1.

The gross regional domestic product (GRDP) in the East Java province is estimated at Rp 20,452 billion in 1988, of which agricultural sector contributes to 29% or Rp 5,884 billion. In case of Nganjuk and Banyuwangi Kabupatens, the agricultural sector bears 55% and 46% of GRDP, respectively. However, the per capita GRDP in agricultural sector is much lower than that of non-agricultural sector. This indicates the living standard of farmers would be lower than that of the workers in other sectors.

(Unit)	Kab Nganjuk	Kab. Banyuwangi	East Java Province
1. GRDP (Rp 10^9)			
Agricultural sector	211 (55%)	326 (46%)	5,884 (29%)
Non-agricultural sector	173 (45%)	388 (54%)	14,568 (71%)
Total	384 (100%)	714 (100%)	20,452 (100%)
2. Per Capita GRDP (Rp 10^3)			
Agricultural sector	280	332	262
Non-agricultural sector	864	923	1,441
Average	403	509	627

See Table IV 2-2.

3.2 Agricultural Production

(1) Land Use

Agricultural land use in Kabupatens Nganjuk and Banyuwangi is as summarized in the following table. In Nganjuk, the share of agricultural land to total area is bigger than the provincial average. In Kecamatan Bagor the paddy field occupies 41% of the whole area. In Rogojampi, the representative rice production area in Banywangi, the agricultural land constitutes 80% of the total area of which 60% or 4,400 ha has been developed as paddy field.

(1988 Estimation, km^2)

Land Use	Kab. Nganjuk		Kab. Banyuwangi		East Java Province
	Kec. Bagor	Whole Kab.	Kec. Rogojampi	Whole Kab.	
Paddy field (wet & dry)	14 (41%)	430 (36%)	44 (48%)	687 (12%)	11,389 (24%)
Upland field	11 (22%)	323 (27%)	29 (32%)	238 (4%)	11,980 (25%)
Total	51 (100%)	1,183 (100%)	91 (100%)	5,783 (100%)	47,922 (100%)

See Table IV 2-3.

Cropping intensity of paddy is 170% in Bagor i.e. 90% in wet season and 80% in dry season, while in Rogojampi, double cropping of paddy is regularized widely, i.e. the intensity is 100% in wet season and 80% in dry season.

(2) Land Holding

The following table shows the average holding size of paddy field in preliminary survey areas. The average holding size of paddy field of owner farmers is estimated at 1.0 ha for Nganjuk and 0.5 ha for Banyuwangi, respectively, and that of rice producing farmers including both owner and tenant is 0.7 ha and 0.3 ha, respectively.

(Unit: ha/Farm Household)

Item	Kab. Nganjuk		Kab. Banyuwangi		East Java
	Kec. Bagor	Whole Kab.	Kec. Rogojampi	Whole Kab.	
Owner Farmer	0.8	1.0	N.A.	0.5	0.5
Owner and Tenant	0.2	0.7	N.A.	0.3	0.3
Total*	0.2	0.3	N.A.	0.1	0.1

*: Owner, tenant and agricultural laborers.
See Table IV 2-4.

(3) Rice Production

The following table demonstrates the current record of rice cultivation in Kabupatens Nganjuk and Banyuwangi:

(1988 Estimation)

	Kab. Nganjuk		Kab. Banyuwangi		East Java
	Kec. Bagor	Whole Kab.	Kec. Rogojanpi	Whole Kab.	
1. Harvested area (10^3 ha)					
Wet land paddy	11.5	55	7.4	124	1,552
Dry land paddy	-	(0.62)	-	(1.16)	85
Total	11.5	56	7.4	124	1,637
2. Production (10^3 t)					
Wet land paddy	65	283	54	647	7,655
Dry land paddy	-	(1.62)	-	(0.32)	217
Totla					7,872
3. Average Yield (t/ha)					
Wet land paddy	5.7	5.1	7.3	5.2	4.9
Dry land paddy	-	(2.6)	-	(2.0)	2.6
Total	5.7	5.1	7.3	5.2	4.8

See Table IV 2-5.

The unit yields of paddy in Nganjuk and Banyuwangi are higher than that of whole province. The preliminary survey area of Rogojampi shows the best paddy yield in the whole province.

3.3 Agricultural Support System

There are 220 extension offices (WKBPP) in the East Java province as shown in the following table. One extension office covers two to three

Kecamatans on the average condition. One WKBPP commands 3 Kecamatans in case of Nganjak, while only one in case of Banyuwangi. The number of extension workers in a WKBPP is nine on the average in the entire province, nine (9) for Banyuwangi and 12 for Nganjuk.

SUPRA INSUS so far implemented covers 28% of the total paddy field in case of Nganjuk and 27% in case of Banyuwangi, while only 9% in the entire province.

Item	Kab. Nganjuk	Kab. Banyuwangi	East Java Province
1. No. of Kecamatan	20	19	578
2. Rural Extension Center (WKBPP)			
a. Total Number	6	15	220
b. No. of WKBPP per Kecamatans	3.3	1.3	2.6
3. No. of Extension Workers (Food Crops)			
a. Total Number	71	137	2,055
b. No. of PPL per Kecamatans	3.6	7.2	3.6
c. No. of PPLs per WKBPP	12	9	9.3
4. SUPRA INSUS Program			
a. No. of Target Kecamatans	19	13	-
b. No. of WKBPP under SUPRA INSUS	6	12	-
c. No. of UHSI	-	-	-
5. Area Under SUPRA INSUS (Paddy Field)			
a. Harvested area under SUPRA INSUS (10^3 ha)			
- 1987/88 (Wet season)	5.5	18.5	24
- 1988 (dry season)	10.0	15.0	116.1
b. Total Paddy Harvested area (10^3) (Wet season, dry season)	55	124	1,552
c. Share of area under SUPRA INSUS (%) (a/b)	28	27	9

4. SOUTH SULAWESI PROVINCE

4.1 Outline of the Study Area

The South Sulawesi province consists of 23 Kabupatens. Kabupatens Sidrap and Pinrang including the preliminary survey areas are located at 160 km and 170 km north of Ujunpandan, the capital of south Sulawesi province, respectively. The paddy field in both kabupatens are commanded by the Sadan Irrigation system.

The population of the South Sulawesi province is at about 7 million as of 1988, of which Kabupatens Pinrang and Sidrap share about 4% and 3%, respectively. The shares of farm households to total households are 87% in Mattiro Bulu and 90% in Maritengae, and are higher than respective Kabpaten averages and province average.

(1988 Estimation)

		Kab. Pinrang		Kab. Sidrap		South Sulawesi
		Mattiro Bulu	Whole Kab.	Maritengae	Whole Kab.	
1. Area	(km^2)	161	2,508	157	2,446	62,483
2. Population/Household						
Total population	(10^3)	23	293	47	230	6,968
No. of household	(10^3)	4.8	55	9.5	44	1,359
Average family size	(Person/House)	4.9	5.3	4.9	5.2	5.1
Share of farm household	(%)	87	65	90	66	68
Population density	(Person/km^2)	143	117	299	94	112
3. Classification of Farm Household (%)						
Owner farmer		56	46	44	45	37
Tenant farmer		44	29	31	45	51
Agricultural laborer		10	25	25	10	12
Total		100	100	100	100	100

See Table IV 2-1.

The gross regional domestic product (GRDP) in the province is Rp 2,591 billion in 1987, of which agricultural sector contributes 45% or Rp 1,176 billion. In the preliminary survey area, agricultural sector is dominantly shares 66% of GRDP. Per capita GRDP in agricultural sector of the preliminary survey areas is higher than that of province average. A deep gap on the per capita GRDP is observed among the agricultural and non-agricultural sectors, while no significant difference of the said GRDP in the preliminary survey area.

(1987)

Item (Unit)	Kab. Pinrang	Kab. Sidrap	South Sulawesi Province
1. GRDP (Rp 10^9)			
Agricultural sector	85 (66%)	66 (66%)	1,176 (45%)
Non-agricultural sector	43 (34%)	34 (34%)	1,415 (55%)
Total	128 (100%)	100 (100%)	2,591 (100%)
2. Per Capita GRDP (Rp 10^3)			
Agricultural sector	446	435	248
Non-agricultural sector	419	435	635
Average	437	435	372

See Table IV 2-2.

4.2 Agricultural Production

(1) Land Use

The agricultural land so far developed in both kabupatens and province is summarized as follows:

The share of paddy field to the total area is only 9% in the entire province. In Pinrang and Sidrap Kabupatens, the paddy field shares 12% and 16% respectively to the total area. The said share of the preliminary survey area of Maritengae is exceptionally as large as 62% in this province.

(1987, km^2)

Land Use	Kab. Pinrang		Kab. Sidrap		South Sulawesi Province
	Kec. Mattiro Bulu	Whole Kab.	Kec. Maritengae	Whole Kab.	
Paddy Land (wet & dry)	53 (33%)	303 (12%)	98 (62%)	380 (16%)	5,913 (9%)
Total Area	161 (100%)	2,508 (100%)	157 (100%)	2,446 (100%)	62,483 (100%)

See Table IV 2-3.

The average land holding size of owner farmers in the province is 1.7 ha/household. This is practically 5 times larger than that of Java

island. The average land holding size and/or the farming size are as summarized below:

(Unit: ha)

Item	Kab. Pinrang		Kab. Sidrap		South Sulawesi Province
	Kec. Mattiro Bulu	Whole Kab.	Kec. Maritengae	Whole Kab.	
Owner Farmer	1.7	1.8	2.6	2.9	1.7
Owner and Tenant	1.0	1.1	1.5	1.5	0.7
Total*	1.0	0.4	0.9	0.6	0.6

*: Owner, tenant and agricultural laborer

(2) Paddy Production

Unit yields of paddy in Kabupaten Pinrang and Sidrap in 1988 were 5.0 ton/ha and 6.6 ton/ha, respectively. Those of Kecamatan Maritengae and Mattiro Bulu are almost the same as Kabupaten average as shown below:

(1988 Estimation)

	Kab. Pinrang		Kab. Sidrap		South Sulawesi Province
	Kec. Mattiro Bulu	Whole Kab.	Kec. Maritengae	Whole Kab.	
1. Harvested area (10^3 ha)					
Wet land paddy	6.4	61.7	13.6	58.7	672
Dry land paddy	-	(0.024)	-	(0.027)	20
Total	6.4	61.7	13.6	58.7	692
2. Production (10^3 t)					
Wet land paddy	33.9	307.6	92.5	389.9	2,812
Dry land paddy	-	(0.06)	-	(0.019)	39
Total	33.9	307.7	92.5	389.9	2,851
3. Average Yield (t/ha)					
Wet land paddy	5.3	5.0	6.8	6.6	4.2
Dry land paddy	-	(2.7)	-	(0.7)	2.0
Total	5.3	5.0	6.8	6.6	4.1

See Table IV 2-5.

4.3 Agricultural Support System

Total 132 extension offices have been established in the entire province. One extension office commands one to two kecamatans. The number of extension workers in the extension office is 15 persons in case of Pinrang and 16 persons in case of Sidrap.

SUPRA INSUS for paddy cultivation has been implemented recently and so far served 46% of total paddy field in Pinrang and 78% in Sidrap. The performance progress of SUPRA INSUS service in the province is limited to 12% so far.

Item	Kab. Pinrang	Kab. Sidrap	South Sulawesi Province
1. No. of Kecamatan	7	7	169
2. Rural Extension Center (WKBPP)			
a. Total No.	6	5	132
b. No. of WKBPP per Kec.	0.9	0.7	0.8
3. No. of Extension Worker (Food Crops)			
a. Total No.	90	80	1,309
b. No. of PPL per Kec.	13	11	8
c. No. of PPL per WKBPP	15	16	10
4. SUPRA INSUS PROGRAM			
a. No. of Target Kecamatans	7	7	-
b. No. of WKBPP under SUPRA INSUS	6	5	-
c. No. of UHSI	-	-	-
5. AREA UNDER SUPRA INSUS (paddy field)			
a. Cultivated area (10^3 ha)			
- 1987/88 (Wet season)	12.7	20.5	36.4
- 1988 (dry season)	15.6	25.3	47.1
b. Harvested area (10^3 ha) (Wet season, dry season)	62	58	672
c. Share of area under SUPRA INSUS (%) (a/b)	45.6	78.4	12.4

5. LAMPUNG PROVINCE

5.1 Outline of the Study Area

Lampung Province consisting of 4 Kabupatens is located in the southeastern-most of Sumatra Island. Lampung Tengah Kabupaten has 26 Kecamatans, out of which Trimurjo and Seputih Raman Kecamatans are selected as the preliminary survey areas. Trimurjo is located at about 35 km north and Seputih Raman is about 50 km north-northeast, respectively from the provincial capital of Tanjungkalang. The

preliminary survey areas are part of the Way Sekampun Irrigation System commanding about 40 thousand ha.

The population of Lampung Tengah is approximately 1.8 million or about 26% of the total population in the province as of 1988. The population density per km^2 is far high as 741 in Trimurjo and 349 in Seputih Raman compared with the provincial average of 193. Both Kecamatans are considered to be comparatively highly populated areas in rural area in Indonesia.

The farm households shares 81% of total households in both preliminary survey areas. The households of agricultural laborer share about 10% of the total households in the preliminary survey areas. The share of labor household is lower than those observed in the other objective provinces.

(1988)

		Kab. Lampung Tengah			Lampung Province
		Kec. Trimurjo	Kec. Seputih Raman	Whole Kab.	
1. Area	(km^2)	58	115	9,190	35,377
2. Population/Household					
Total population	(10^3)	43	40	1,788	6,845
No. of household	(10^3)	8	8	349	1,488
Average family size	(Person/House)	5.2	5.1	5.1	4.6
Share of farm household	(%)	81	81	84	76
Population density	(Person/km^2)	741	349	195	193
3. Classification of Farm Household (%)					
Owner farmer		74	78	80	76
Tenant farmer		17	13	14	16
Agricultural laborer		9	9	6	8
Total		100	100	100	100

See Table IV 2-1.

The agricultural sector shares about 47% of the gross regional domestic product (GRDP) of the provincial GRDP and 55% of the Kabupaten GRDP. Per capita GRDP is Rp 240 thousand at the province level while Rp 270 thousand at the Kabupaten level. The economic situation of Lampung Tengah is almost equal to that of the province as far as the per capita GRDP is concerned.

(1987)

	Kab. Lampung Tengah	Lampung Province
1. GRDP (Rp 10^9)		
Agricultural sector	269 (55%)	774 (47%)
Non-agricultural sector	220 (45%)	861 (53%)
Total	489 (100%)	1,635 (100%)
2. Per Capita GRDP (Rp 10^3)		
Agricultural sector	179	163
Non-agricultural sector	765	413
Average	272	239

See Table IV 2-2.

5.2 Agricultural Production

The share of wet and dry paddy land to total area of the province is only 7%, which is extremely lower than that of the other objective provinces. On the other hand, wet and dry paddy land in the preliminary survey areas occupies around 50% of total land. Cassava is planted as a major upland crop, and such crops as coffee, pepper and clove are grown in estates in the province. Land use is as following table:

(1987, ha)

Use	Kab. Lampung Tengah			Lampung Province
	Kec. Trimurjo	Kec. Seputih Raman	Whole Kab.	
Paddy field (wet & dry)	3,200 (55%)	5,600 (49%)	104,400 (11%)	264,400 (7%)
Upland field	1,300 (22%)	3,800 (33%)	32,200 (4%)	68,100 (2%)
Estate	0 (0%)	0 (0%)	52,200 (6%)	196,000 (5%)
Others	1,300 (22%)	2,100 (18%)	730,200 (79%)	3,009,200 (85%)
Total Area	5,800 (100%)	11,500 (100%)	919,000 (100%)	3,537,700 (100%)

Since Way Sekampung Irrigation System has no reservoir for regulating the river discharge, the irrigable paddy field is sometimes reduced to around 50% of total service area in the dry season. Therefore, the dry season cropping is scheduled according to the annual rotation program to be set on the irrigation blocks. The cropping

intensity of paddy in the preliminary survey area changes year by year between 150% and 200% depending on the availability of irrigation water. Major Palawija crops are maize and beans, which are mainly grown in the off-season between dry and wet season paddy. Actual cropping of these palawija is, however, still limited to small area at present.

The following table shows the average holding size of paddy field per farm household. The average holding and farming sizes of Trimurjo are larger than those of whole kecamatan and province. In Septih Raman owner farmer's holding size is larger than province average.

(1987, ha)

	Lampung Tengah			Lampung Province
	Kec. Trimurjo	Kec. Seputih Raman	Whole Kab.	
Owner Farmer	0.8	1.0	0.5	0.3
Owner and tenant	0.6	0.4	0.4	0.3
Total*	0.6	0.4	0.4	0.2

*: Owner, tenant and agricultural laborer.

The annual average yield of paddy is 3.6 t/ha in the entire the province and 3.8 t/ha in the Kabupaten Lampung Tengah. In case of Kecamatan Trimurjo and Seputih Raman, high yields of 5.6 t/ha and 5.0 t/ha respectively have been achieved through regularization of double cropping of paddy.

(1988 Estimation)

	Lampung Tengah			Lampung Province
	Kec. Trimurjo	Kec. Seputih Raman	Whole Kab.	
1. Harvested area (10^3 ha)				
Wet land paddy	4.8	11.2	107.9	237.4
Dry land paddy	0	0	31.6	118.2
Total	4.8	11.2	139.5	355.6
2. Production (10^3 t)				
Wet land paddy	27.1	55.7	461.7	1,039.1
Dry land paddy	0	0	68.8	249.8
Total	27.1	55.7	530.5	1,288.9
3. Average Yield (t/ha)				
Wet land paddy	5.6	5.0	4.3	4.4
Dry land paddy	0	0	2.2	2.1
Total	5.6	5.0	3.8	3.6

See Table IV 2-5.

5.3 Agricultural Support System

The total 22 rural extension centers (WKBPP) have been established in Lampung Tengah Kabupaten, and are executing the extension services to 26 Kecamatans as summarized in the following table. Number of extension workers assigned in a center is 10.5 on the average. This is rather short compared with the other objective preliminary survey areas.

Item	Kab. Lampung Tengah	Lampung Province
1. No. of Kecamatan	26	77
2. Rural Extension Center (WKBPP)		
a. Total Number	22	45
b. No. of WKBPP per Kecamatan	0.85	0.58
3. No. of Extension Workers (Food Crops)		
a. Total Number	273	394
b. No. of PPL per Kecamatan	10.5	-
4. SUPRA INSUS Program		
a. No. of Target Kecamatans	26	-
b. No. of WKBPP under SUPRA INSUS	22	-
5. Area Under SUPRA INSUS (Paddy Field)		
a. Harvested area Under SUPRA INSUS (10^3 ha)	-	-
- 1987/88 (Wet season)	13.9	-
- 1988 (dry season)	22.6	-
Total	36.5	-
b. Total Harvested area (10^3 ha) (Wet season, dry season)	139.4	355.6
c. Share of area under SUPRA INSUS (%) (a/b)	26.2	-

6. SELECTION OF SURVEY AREAS

A Kecamatan was selected out of the two preliminary survey areas (Kecamatans) of one study area (province) as a survey area, for which a plan for improvement of rice post harvest and marketing will be formulated. The selection of objective kecamatans was made according to the following criteria based on the study result mentioned above and interview survey result (details are shown in Annex V).

1) to have good irrigation facilities and farm road, and to be geographically suitable for the pilot plan,

2) to have active farmers' groups and extension services,

3) to have strong support services and have positive attitude toward the plans, and

4) to be main rice cultivation area.

The selected survey areas are as follows (present condition of these areas are mentioned in Annex VI):

Province	Kabupaten	Survey Area
West Java	Karawang	Telagasari
East Java	Nganjuk	Bagor
South Sulawesi	Pinrang	Mattiro Bulu
Lampung	Central Lampung	Trimurjo

Table IV 2-1 POPULATION AND HOUSEHOLD

Province/1	Kabupaten/2 /Kecamatan/3	Area (km2)	Population (1,000)	Household (1,000)	Average Family Size	Share of Farm Household (%)	Population Density (/km2)
West Jawa		46,300	33,085	4,389	4.1	54	715
	Karawang	1,753	1,380	225	4.2	68	787
	Telagasari	50	50	13	3.9	79	992
	Subang	1,864	1,149	211	4.0	73	616
	Pagaden	85	70	14	3.7	73	824
East Jawa		47,922	32,607	7,764	4.2	69	680
	Nganjuk	1,183	953	221	4.3	79	806
	Bagor	52	51	12	4.3	92	981
	Banyuwangi	5,783	1,402	351	4.0	70	242
	Rogojanpi	73	84	23	3.7	70	1,151
South Sulawesi		62,483	6,968	1,359	5.1	68	112
	Pinrang	2,508	293	55	5.3	65	117
	Mattiro Bulu	161	23	5	4.9	87	143
	Sidrap	2,446	230	44	5.2	66	94
	Maritengae	157	47	10	4.9	90	299
Lampung		35,377	6,845	1,488	4.6	76	193
	Lampung Tengah	9,190	1,788	349	5.1	84	195
	Trimurjo	58	43	8	5.2	81	741
	Seputih Raman	115	40	8	5.1	81	349

Source : /1 ; Statistik Indonesia 1987, CBS
/2 ; Dalam Angka 1987, Provinsi Kantor Statistik
/3 ; Dalam Angka 1987, Kabupaten Kantor Statistik

Table IV 2-2 GROSS REGIONAL DOMESTIC PRODUCT (GRDP)
-Current Price-

Unit *1;10^9 Rupiah, *2;10^3 Rupiah

Province/1 Kabupaten/2	Gross Regional Domestic Product*1			Per Capita GRDP*2		
	Agricultural Sector	Non-agri. Sector	Total	Agricultural Sector	Non-agri. Sector	Total
West Jawa	4,068	14,620	18,688	226	969	565
	(22%)	(78%)	(100%)			
Karawang	275	440	715	199	1,020	518
	(38%)	(62%)	(100%)			
Subang	166	256	422	290	813	356
	(39%)	(61%)	(100%)			
East Jawa	5,884	14,568	20,452	262	1,441	627
	(29%)	(71%)	(100%)			
Nganjuk	211	173	384	280	864	403
	(55%)	(45%)	(100%)			
Banyuwangi	326	388	714	332	923	509
	(46%)	(54%)	(100%)			
South Sulawesi	1,176	1,415	2,591	248	635	372
	(45%)	(55%)	(100%)			
Sidrap	66	34	100	435		435
	(66%)	(34%)	(100%)			
Pinrang	85	43	128	446	419	437
	(66%)	(34%)	(100%)			
Lampung	774	861	1,635	163	413	239
	(47%)	(53%)	(100%)			
Lampung Tengah	269	220	489	179	765	272
	(55%)	(45%)	(100%)			

Source : /1 ; Statistik Indonesia 1987, CBS
/2 ; Dalam Angka 1987, Provinsi Kantor Statistik

Table IV 2-3 CLASSIFICATION OF FARM HOUSEHOLD AND AREA OF PADDY FIELD

Province/1 Kabupaten/2 /Kecamatan/3	Ratio of Farm Household (%)			Area and share of paddy field			
	Land Owner	Tenant	Agricultural Laborer	Paddy Field*1 (km2)	(%)	Total (km2)	(%)
West Jawa	51	11	38	13,500	29.2	46,300	100
Karawang	21	31	48	972	55.4	1,753	100
Telagasari	38	21	41	40	80.0	50	100
Subang	28	15	57	885	47.5	1,864	100
Pagaden	52	5	43	56	65.9	85	100
East Jawa	39	27	34	11,389	23.8	47,922	100
Nganjuk	36	17	44	430	36.3	1,183	100
Bagor	23	52	25	21	41.2	51	100
Banyuwangi	32	21	47	687	11.9	5,783	100
Rogojanpi	N.A	N.A	N.A	44	48.4	91	100
South Sulawesi	37	51	12	5,913	9.5	62,483	100
Sidrap	45	45	10	380	15.5	2,446	100
Maritengae	44	31	25	98	62.4	157	100
Pinrang	46	29	25	303	12.1	2,508	100
Mattiro Bulu	56	44	0	53	33.0	161	100
Lampung	76	16	8	2,644	7.5	35,377	100
Lampung	80	14	6	1,044	11.4	9,190	100
Trimurjo	74	17	9	42	72.8	58	100
Seputih Raman	78	13	9	56	48.7	115	100

Source : /1 ; Statistik Indonesia 1987, CBS
/2 ; Dalam Angka 1987, Provinsi Kantor Statistik
/3 ; Dalam Angka 1987, Kabupaten Kantor Statistik
Note : N.A; Data not available
*1 ; Wet land paddy and dry land paddy

Table IV 2-4 AVERAGE PADDY CULTIVATED AREA

Unit : Ha

Province/1	Kabupaten/2 /Kecamatan/3	Land Owner	Owner and Tenant	Total Farm Household
West Jawa		0.6	0.5	0.3
	Karawang	2.1	0.8	0.4
	Telagasari	1.0	0.7	0.4
	Subang	1.5	1.0	0.4
	Pagaden	0.8	0.7	0.4
East Jawa		0.5	0.3	0.1
	Nganjuk	1.0	0.7	0.3
	Bagor	0.8	0.2	0.2
	Banyuwangi	0.5	0.3	0.1
	Rogojanpi	N.A.	N.A.	0.1
South Sulawesi		1.7	0.7	0.6
	Sidrap	2.9	1.5	0.6
	Maritengae	2.6	1.5	0.9
	Pinrang	1.8	1.1	0.4
	Mattiro Bulu	1.7	1.0	1.0
Lampung		0.3	0.3	0.2
	Lampung	0.5	0.4	0.4
	Trimurjo	0.8	0.6	0.6
	Seputih Raman	1.0	0.4	0.4

Source : /1 ; Statistik Indonesia 1987, CBS
/2 ; Lampiran Laporan Tahunan, Dinas Pertanian Tanaman Pangan
/3 ; Evaluasi WKBPP, BPP
Note : N.A.; Data not available
1 ; including agricultural laborer

Table IV 2-5 PADDY HARVESTED AREA, PRODUCTION, YIELD IN RELATED AREA

Province/1	Kabupaten/2 /Kecamatan/3	Harvested Area (1,000 ha)			Production (1,000ton)			Average Yield (ton/ha)		
		Wet Land	Dry Land	Total	Wet Land	Dry Land	Total	Wet Land	Dry Land	Total
West Jawa		1,905.0	132.0	2,037.0	8,973.0	290.0	9,263.0	4.7	2.2	4.5
	Karawang	187.0	0.3	187.3	972.0	0.8	972.8	5.2	2.7	5.2
	Telagasari	8.0	0.0	8.0	53.2	0.0	53.2	6.8	0.0	6.8
	Subang	159.0	2.8	161.8	803.0	7.0	810.0	5.1	2.5	5.0
	Pagaden	9.5	0.8	10.3	55.9	2.0	57.9	5.9	2.5	5.6
East Jawa		1,552.0	85.0	1,637.0	7,655.0	217.0	7,872.0	4.9	2.6	4.8
	Nganjuk	55.0	0.6	55.6	283.0	1.6	284.6	5.1	2.7	5.1
	Bagor	11.5	0.0	11.5	65.0	0.0	65.0	5.7	0.0	5.7
	Banyuwangi	124.0	0.2	124.2	647.0	0.3	647.3	5.2	2.0	5.2
	Rogojanpi	7.4	0.0	7.4	54.0	0.0	54.0	7.3	0.0	7.3
South Sulawesi		672.0	20.0	692.0	2,812.0	39.0	2,851.0	4.2	2.0	4.1
	Sidrap	58.7	0.0	58.7	389.9	0.0	389.9	6.6	0.7	6.6
	Maritengae	13.6	0.0	13.6	61.2	0.0	61.2	4.5	0.0	4.5
	Pinrang	61.7	0.0	61.7	307.6	0.1	307.7	5.0	2.5	5.0
	Mattiro Bulu	6.4	0.0	6.4	33.9	0.0	33.9	6.4	0.0	6.4
Lampung		237.4	118.2	355.6	1,039.1	249.8	1,288.9	4.4	2.1	3.6
	Lampung	107.9	31.6	139.5	461.7	68.8	530.5	4.3	2.2	3.8
	Trimurjo	4.8	0.0	4.8	27.1	0.0	27.1	5.6	0.0	5.6
	Seputih Raman	11.2	0.0	11.2	55.7	0.0	55.7	5.0	0.0	5.0

Source : /1 ; Statistik Indonesia 1987, CBS
/2 ; Lampiran Laporan Tahunan, Dinas Pertanian Tanaman Pangan
/3 ; Evaluasi WKBPP, BPP

ANNEX V

FARM SURVEY

STUDY ON
IMPROVEMENT OF RICE POST HARVEST
AND MARKETING IN FARMER GROUPS

ANNEX-V FARM SURVEY

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENT

1. FARMERS' INTERVIEW SURVEY

1.1 General

Farmers interview survey is conducted to clarify the present farmers' social and economic condition. The farmers who manages the paddy field ofaround average size are selected in each area. The sample farmers are selected taking into account their farming size which are considered to be an average in each areas. The samples are all toether 624 in total, as broken down below:

Province	Kabupaten	Kecamatan (Preliminary Survey Area)	Owner Farmer	Tenant Farmer	A.L./1	Total
West Java	Karawang	Telagasari/2	33	17	10	60
		Telukjambe	35	20	10	65
	Subang	Pagaden	33	17	10	60
East Java	Nganjuk	Bagor	30	16	10	56
	Banywangi	Rogojanpi/2	45	5	10	60
		Glagah	42	8	10	60
South Sulawesi	Sidrap	Maritengae	49	17	10	76
	Pinrang	Mattiro Bulu	35	22	0	57
Lampung	Lampung Tengah	Trimurjo	42	14	10	66
		Seputih Raman	53	1	10	64
	Total		397	137	90	624

/1 : Agricultural Laborer

/2 : Additionally selected because Telukjambe and Glagah was found to be unsuitable as preliminary survey areas.

The survey items are as follows:

On owner farmers/tenant farmers

- Farming practices of paddy,
- Post harvest activities,
- Marketing (sale, sales time, marketing channels, transportation, price, quality),
- Non-farm income,
- Living expense,

- Farmers' intention (farmer's organization, supporting system, post harvest activity, etc.)

On agricultural laborers

- Employment system,
- Income and expense

The main result obtained through survey is in the following sections:

1.2 Farming Activities

Farming activities from harvesting to marketing are shown in Tables V 1-1 to 1-8 based on the interview survey. Their activities and characteristics are illustrated on Figs. V 1-1 and V 1-2, and the results for selected survey areas are analysed in Annex VI.

The quality and source of farmers' paddy seeds are also surveyed, and the result is shown in Table V 1-9. Most farmers apply certified seeds in all the preliminary survey areas except two areas. Certified, good/ordinary and unknown seeds occupy around 30% respectively in Pagaden in West Jawa, and unknown seeds are dominant in Rogojanpi in East Jawa.

Machines and equipments owned by farmers are shown in Table V 1-10 by the share of farmers who have each machine/equipment. Mechanization is not developed so much according to the result. It is marked that 40% and 60% of farmers own pedal threshers in Bagor in East Jawa and in Seputih Raman in Lampung respectively.

The condition of participation to organizations is given in Table V 1-11. The share of participants to organizations is relatively high, being 60-90% in all the areas, while the share of participants to water user's association is fairly low in Pagaden, Trimurjo and Septih Raman.

1.3 Farmers' Intention

Farmers' intention on post harvest and marketing activities in selected 4 survey areas is shown in Table V 1-12.

Farmers have many kinds of problems in process of post harvest activities especially during wet season in the all survey areas. More than 80% of the farmers have problems in every work item in wet season, on the other hand, less than 20% of farmers in dry season. Accordingly, the problems pointed out by many farmers are prolonged harvesting work due to rainfall, deterioration of paddy due to shortage of drying facilities and difficulties of transfportation due to muddy roads, etc. The farmers are eager to solve these problems in all areas. It is common in all survey areas that they desire the development of roads for the purpose of efficient transportation, the introduction of rice mills, and development of warehouses so as to improve the present marketing activities.

Farmers also wish the diffusion of current market price information of paddy and rice. It is considered that the market information which contains the wholesale price of rice in the concerned Kabupatens and the cities/towns nearby, and the farmgate price of paddy in and around their Desas is required.

In Telagasari introduction of improved sickles, pedal threshers and drying facilities is desired to improve each process of harvesting, threshing and drying.

In Bagor introduction of improved sickles and construction of additional concrete floors is desired to improve harvesting activities, threshing and drying.

In Mattiro Bulu farmers have interests on introduction of mechanical harvesters and power threshers. Around 50% of farmers wish to improve drying process through utilization of mechanical dryers and additional concrete floors. It is considered that this is because lack of manpower is serious and the farmers are much interested in mechanization of their field work.