The area of lowland paddy field has significantly increased by 825 thousand ha from 1983 to 1991, with an average annual increasing rate of 103 thousand ha. The increase of paddy field during this period is obvious in Kalimantan and Sumatera. Total expanded area is 430 thousand ha (equivalent to 54 thousand ha per year) for Kalimantan and 239 thousand ha (equivalent to 30 thousand ha per year) for Sumatera, respectively, which accounts for 82% of total area increase.

The area increase of paddy field in the period is attributed largely to the increase in inland swamp and other area, which increased by 626 thousand ha or 76% of total increased lowland paddy field, with an average annual increasing rate of 78 thousand ha. However these area does not largely contribute to the paddy production. Area expansion of irrigated paddy field (technical and semi technical level) during the same period has been 270 thousand ha or 33% of the increased area. On the other hand, irrigated paddy field under simple system and rainfed paddy field have slightly decreased due to grade up of irrigation system or facilitating irrigation system. There is also no big change in the area of tidal swamp paddy field during the same period.

3.2 Utilization of Lowland Paddy Field by Ecosystem

The planted area of paddy, palawija and estate crops in lowland paddy field and the cropping intensity based on the planted area (CIp) is shown in Table 3.7 and summarized below:

Cropping intensity in wetland area (CIp) by island group as of 1989

Province/Island	Field area (000 ha)	Planted area (1,000 ha)			Cropping Intensity (CIp)		
		Paddy	Palawija	Estate crops	paddy	paddy & palawija	paddy, palawija & estate crops
Sumatera	2,257.4	2,156.5	105.2	89.2	0.955	1.002	1.041
Jawa	3,445.7	4,695.7	1,381.3	444.1	1.363	1.764	1.893
Bali & Nusa Tenggara	409.9	484.4	180.3	15.0	1.182	1.622	1.658
Kalimantan	1,282.3	608.9	9.1	11.3	0.475	0.482	0.491
Sulawesi	831.3	931.7	86.5	21.5	1.121	1.225	1.251
Maluku & Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Indonesia	8,226.6	8,877.1	1,793.4	580.8	1.079	1.297	1.368

Source: Agricultural Survey Land area by utilization, CBS, 1989; Production of cereals in Indonesia, CBS, 1989. Data of DGFCA MOA

The CIp of whole crops in lowland paddy field is the highest in Jawa, followed by Bali and Nusa Tenggara and Sulawesi. The lowest is found in Kalimantan followed by Sumatera. The CIp of paddy plant is also the highest in Jawa, followed by Bali and Nusa Tenggara, and

the lowest in Kalimantan followed by Sumatera. The CIp of palawija in paddy field is the highest in Bali and Nusa Tenggara followed by Jawa, and the lowest in Kalimantan. Rather high CIp of palawija in Jawa and Bali and Nusa Tenggara explains crop diversification is already progressed in these area. And this implies two possible interpretation, one is crop diversification is more profitable and the other is water is critical for paddy cultivation in dry season. The CIp of estate crops in paddy field is also the highest in Jawa. The planting area of estate crops in paddy field in outer of Jawa is negligibly small compared with that of Jawa.

The reason why the high CIp in Jawa and the low CIp in Kalimantan can be explained by the area ratio of irrigated paddy field to total paddy field. The area ratio of irrigated paddy field to total field is the highest in Jawa and the lowest in Kalimantan, as shown below:

Area ratio of irrigated field to total paddy field (%)

	Sumatera	Jawa	Bali & NT	Kalimantan	Sulawesi	Indonesia
Ratio	41.0	74.4	75.5	10.8	61.1	53.9

Source: Land area by utilization, CBS, 1991

Since there is no reliable data on the cropped area and harvested area by the irrigation type, the study is carried out by the assumption that there is very little difference in CIp and cropping intensity based on harvested area (CI_h) among each type of irrigation system. Under this assumption CIp and CI_h of each ecosystem are calculated by regression method.

The lowland paddy field area and CIp by ecotype are shown in Tables 3.8 to 3.10 and summarized below:

Planted area based Paddy Cropping Intensity (CI_p) by Ecosystem 1991

Province/Island	Irrigated		Rainfed		Others		Total	
	Field area	CIp	Field area	CIp	Field area	CIp	Field area	CIp
Sumatera	910.1	1.38	606.5	1.04	702.6	0.58	2,219.3	1.03
Jawa	2,546.1	1.66	847.5	1.34	26.0	0.60	3,419.5	1.57
Bali & Nusa Tenggara	307.5	1.56	70.8	0.56	30.0	0.03	408.3	1.28
Kalimantan	139.9	0.79	369.1	0.82	793.4	0.39	1,302.4	0.56
Sulawesi	528.6	1.39	271.1	0.84	65.7	0.19	8365.5	1.12
Maluku & Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Indonesia	4,432.2	1.55	2,165.1	1.04	1,617.7	0.48	8,215.0	1.20

Source: JICA-FIDP team calculation based on Agricultural Survey Land Area by Utilization 1991, CBS; Production of Cereals 1991, CBS

The cropping intensity based on the harvested area (CI_h) of paddy plant in each ecotype of lowland paddy field are shown in Tables 3.11 to 3.13 and summarized as follows:

Harvested area based Paddy Cropping Intensity (CI_h) by Ecosystem 1991

Province/Island	Irrigated		Rainfed		Others		Total	
	Field area	CI_h	Field area	CI_h	Field area	CI_h	Field area	CI_h
Sumatera	910.1	1.39	606.5	1.00	702.6	0.46	2,219.3	0.99
Jawa	2,546.1	1.52	8847.5	1.14	26.0	0.41	3,419.5	1.47
Bali & Nusa Tenggara	30705	1.45	70.8	052	30.0	0.02	408.3	1.18
Kalimantan	139.9	0.70	369.1	0.73	793.4	0.35	1,302.4	0.50
Sulawesi	528.6	1.37	271.1	0.83	65.7	0.19	865.5	1.11
Maluku & Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Indonesia	4,432.2	1.44	2,165.1	0.97	1,617.7	0.39	8,215.0	1.12

Source: JICA-FIDP team calculation based on Agricultural Survey Land Area by Utilization 1991, CBS; Production of Cereals 1991, CBS

There is a big difference in CI_P and CI_h among the paddy field under different ecosystem, the highest CI_P and CI_h are found in the irrigated field, followed by the rainfed field and the lowest in the other paddy field. There is also found a big difference in CIp and CI_h among the islands and provinces, the highest values are found in Jawa followed by Bali and Nusa Tenggara and Sulawesi. In several provinces, DI Aceh, Riau, Nusa Tenggara Timur, all provinces of Kalimantan and Sulawesi Tenggara, CIp and CI_h of irrigated field shows lower value compared with the other provinces (refer to Tables 3.8 to 3.13). By construction of irrigation system in the rainfed area, CI_P and CI_h can be increased 1.04 to 1.55 and 0.97 to 1.44, respectively. Since there is a big difference in the area ratio of irrigated field to designed area among the different type of irrigation as shown below, the construction of technical irrigation system is the most favourable for increasing harvested area as well as efficient water use.

Designed area and irrigated paddy field area by type of irrigation

unit : 000 ha

Irrigation Type	Designed Area (Luas Baku) (1)	Irrigated Paddy Field (Sawah Irigasi) (2)	Ratio (3)=(1)/(2)
Technical	2,702	2,398	89%
Semi-Technical	1,271	919	72%
Simple	846	556	66%
All Schemes	4,819	3,873	80%

Source: Buku Inventarisasi 1989, DOI I, MPW

Since there is no big difference in the CI_P of irrigated paddy field in the rainy season among the provinces, the difference in CIp of irrigated paddy field in whole year may be due to the difference in CIp of dry season (refer to Table 3.14), as shown below

CIp of Irrigated Paddy Field at Selected Province by Cropping Season

Province/Island	Dry season		Wet season		Whole year	
	Paddy	Others	Paddy	Others	Paddy	Others
Sumatera	0.66	0.09	0.97	0.04	1.63	0.13
Aceh	0.13	0.04	0.90	0.02	1.02	0.06
Sumatera Barat	0.92	0.05	1.04	0.01	1.96	0.06
Lampung	0.54	0.17	0.98	0.07	1.52	0.24
Jawa	0.61	0.32	0.87	0.12	1.49	0.44
Jawa Barat	0.83	0.08	0.98	0.03	1.81	0.11
Jawa Tengah	0.55	0.33	0.81	0.13	1.36	0.47
Jawa Timur	0.48	0.52	0.83	0.19	1.31	0.71
Bali & Nusa Tenggara	0.50	0.59	1.03	0.06	1.52	0.65
Kalimantan	0.35	0.02	1.11	0.01	1.46	0.02
Sulawesi	0.65	0.07	0.97	0.02	1.62	0.10
Maluku & Irian Jaya	0.21	0.19	0.63	0.15	0.84	0.34
Indonesia	0.61	0.28	0.91	0.09	1.52	0.37

Source: JICA-FIDP team calculation based on Buku Inventarisasi 1989

A big difference in paddy field utilization between the cropping seasons in some provinces is found. In wet season, there is no big difference in CIp for paddy plant among the provinces within a range of from 0.8 to 1.0. On the other hand, in dry season, CIp for paddy plant differs much among the provinces. For example, Sumatera Barat and Jawa Barat shows high CIp in dry season (0.8 to 0.9) for paddy plant while Lampung, Jawa Tengah, Jawa Timur and Bali and Nusa Tenggara shows relatively lower CIp value (around 0.5) for paddy plant, but CIp of other crops is relatively high (around 0.4). Extreme case is found in Aceh where wet season CIp of paddy plant is 0.9, CIp of. paddy and other crops in dry season is 0.13 and 0.02, respectively. These phenomenon are very interesting. One of the reason of above mentioned phenomena may be due to that the water supply is not enough for paddy cultivation but enough for other crops cultivation in dry season. The other reason may be due to farmers preference for crop selection from the economical point of view. Anyhow, competition on water supply among cultivated crops must be occurred in dry season, and the degree of water shortage for agriculture may be reflected on the difference in CIp.

3.3 Paddy Variety

About 70 improved lowland varieties and many traditional varieties are cultivated in Indonesia in 1988 and 1988/89, and the acreage of major varieties in 1988 and 1988/89 are shown in Tables 3.15 .and 3.16. The acreage of planted area of eight varieties is shown in the following table and the characteristics of major varieties in Indonesia as shown in Table 3.17.

Area of Leading Varieties in 1988 ('000 ha)

Province/Island	PB36	Cisadane	IR64	Kr.Aceh	PB42	Semuru	IR46	IR48	Traditional
Sumatera	49.8	25.6	126.7	10.0	30.6	13.5	87.9	6.4	182.7
Jawa	194.8	378.1	802.1	46.0	5.3	35.9	0.6	16.9	44.41
Bali & Nusa Tenggara	33.4	2.2	13.0	31.3	0.0	4.5	0.0	0.7	5.5
Kalimantan	5.7	5.5	0.1	1.9	12.6	0.0	1.9	0.0	134.1
Sulawesi	45.9	4.0	54.9	2.4	54.5	5.2	41.8	42.9	12.4
Maluku & Irian Jaya	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
Indonesia	329.6	415.3	996.9	91.8	103.1	59.1	132.4	67.0	379.4

Area of Leading Varieties in 1988/89 ('000 ha)

Province/Island	PB36	Cisadane	IR64	Kr.Aceh	PB42	Semuru	IR46	IR48	Traditional
Sumatera	76.6	58.0	109.6	24.1	42.6	13.5	155.8	31.5	289.9
Jawa	561.5	793.4	967.1	187.6	6.6	166.3	0.8	8.6	210.5
Bali & Nusa Tenggara	82.5	2.5	13.7	77.8	0.0	14.1	0.0	0.9	7.7
Kalimantan	17.5	19.0	6.6	9.1	42.9	0.1	3.4	0.0	206.3
Sulawesi	37.9	50.2	36.2	2.7	158.5	3.6	23.3	39.1	36.9
Maluku & Irian Jaya	0.0	0	0.3	0.1	0.0	0.0	0.2	0.0	0.5
Indonesia	775.9	923.1	1133.6	270.5	250.7	197.6	154.1	80.1	751.9

Source: Laporan Hasil Inventarisasi Penyebaran Varietas Padi Musim Tanam (1985-1988), Directorat Bina Produksi, MOA

Three varieties, PB36, Cisadane and IR64, occupy a large area of more than 700 thousand ha each in wet season and more than 300 ha each in dry season.. The planted area of five varieties, Kreung Aceh, PB 42, Semuru, IR 46 and IR48, exceeds 80 thousand ha in wet season and 60 thousand ha in dry season. PB 36 and Cisadane are distributed all over Indonesia, while IR 64 is distributed in the limited area such as Jawa, northern Sumatera and Bali. in 1988 and is now rapidly expanding to whole Indonesia. The planted area of improved varieties is larger than that of the local traditional varieties except Kalimantan. Planted area under improved varieties accounts for about 82% (for dry season) and 88% (for rainy season) of the total planted area in Indonesia. On the other hand, in Kalimantan, more than 50% of planted area is still occupied by traditional varieties. Also in Sumatera traditional varieties are still planted with significant ratio (about 25% of total paddy planted area) especially in Sumatera Utara,. Riau Jambi and Sumatera Selatan. Since there is wide swamp area, improved varieties may not be extended in those islands. One of the reason for low yield in Kalimantan, therefore, may be due to the planted varieties.

The planted area with traditional varieties increases in wet season and decreases in dry season. This means that the traditional varieties are planted in mainly single cropping area,

rainfed or swamp area. Change in planting area of leading varieties in recent few years is shown in following the table.

Seasonal Changes in the Area of Leading Varieties (000 ha)

Variety	Year Introduced	Growth Duration	1988/89	1988	1987/88	1987	1986/87	1986	1986/85	1985
PB36	1977	115	776	330	1,080	590	1,456	846	1,518	733
Cisadane	1980	140	923	415	838	721	1,181	880	1,352	788
IR64	1986	115	1134	997	628	129	7	0	0	0
Kreung Aceh	1981	130	301	92	290	117	276	191	321	147
PB42	1980	135	251	103	241	164	251	128	274	187
Semuru	1980	120	198	59	174	83	174	80	144	66
IR46	1983	130	183	132	154	171	211	134	109	161
IR48	1986	135	80	67	102	76	28	18	0	7
Citanduy	1983	120	53	47	66	32	115	33	3	10
Sadan	1983	125	14	14	55	24	73	50	50	40
Cisokan	1985	115	61	37	63	17	21	5	0	0
IR54	1981	125	43	26	43	66	120	70	96	83
Barito	1981	140	26	28	40	57	39	38	37	34
Kelara	1983	105	31	48	40	66	72	68	53	20
Cikapundun	1984	115	40	23	35	31	48	20	6	1
Bahbolon	1983	125	18	36	22	52	70	63	42	35
Traditional			752	379	1,007	475	905	451	916	460

Source: Laporan Hasil Inventarisasi Penyebaran Varietas Padi Musim Tanam (1985-1988), Directorat Bina Produksi, MOA

The planted area of relatively old varieties, PB36, Cisadane, Kreung Aceh, etc., shows a decreasing tendency. On the other hand, that of newly bred or introduced varieties, IR 64, IR 48, Cisokan, etc. shows an increasing tendency. Especially, planted area of IR 64 is rapidly expanding in Jawa and southern part of Sumatera , and it has occupied more than 50% of total paddy planting area at 1992/93 season in Jawa. These newly introduced varieties not only have a high yield potential but also are endowed resistant or tolerant to diseases and pests.

3.4 Damage by Pests and Diseases

Recently many varieties, with resistant or tolerant to pests and diseases, are released and the farmers employ these varieties. The damage of pests and diseases has decreased. The damage of paddy production by pests and diseases accounts for 0.5% and 0.85% of total harvested area in 1987 and 1990, respectively (Tables 3.18 and 3.19). Major pests are stem borer, brown plant hopper (BPH), gall midge, army worm, leaf folder and rodent. Major diseases are blast, sheath rot, brown leaf spot, bacterial leaf blight (BLB), virus diseases such

as rice tungro virus decease (RTV) and yellow dwarf decease. The damage by diseases is much less than that of pests. The damages is mainly occurred in January to March.

3.5 Yield of Lowland Paddy

3.5.1 Yield of paddy by Eco-system

The yield of paddy plant grown under different ecosystem by province is determined by regression analysis based on the yield data of Agricultural Survey, Production of Cereals in Indonesia 1989, 1990 and 1991, CBS. The results are shown in Tables 37 to 39 and summarized below:

Paddy Yield under Different Ecosystem 1989

Province/Island	Lowland Paddy				Upland
	Irrigated	Rainfed	Others	Whole Area	Paddy
Sumatera	4.29	3.74	2.38	3.86	2.04
Jawa	5.32	4.52	2.51	5.13	2.40
Bali & Nusa Tenggara	4.63	2.88	1.73	4.39	1.84
Kalimantan	2.93	2.69	2.47	2.65	1.66
Sulawesi	4.28	3.85	1.43	4.10	1.73
Maluku & Irian Jaya	-	-	-	-	-
Indonesia	4.90	4.06	2.39	4.53	2.04

Source: JICA-FIDP team calculation based on Agricultural Survey Production of cereals 1989, CBS

Paddy Yield under Different Ecosystem 1990

Province/Island	Lowland Paddy				Upland
	Irrigated	Rainfed	Others	Whole Area	Paddy
Sumatera	4.42	3.62	2.89	3.97	2.11
Jawa	5.50	4.40	2.90	5.27	2.46
Bali & Nusa Tenggara	4.59	3.46	2.32	4.50	1.88
Kalimantan	4.14	2.44	2.61	2.77	1.67
Sulawesi	4.32	3.76	2.58	4.16	1.74
Maluku & Irian Jaya	-	-	-	-	-
Indonesia	5.07	3.84	2.76	4.53	2.09

Source: JICA-FIDP team calculation based on Agricultural Survey Production of Cereals 1990, CBS

Paddy Yield under Different Ecosystem 1991

Province/Island	Lowland Paddy				Upland Paddy
	Irrigated	Rainfed	Others	Whole Area	
Sumatera	4.33	3.92	2.81	3.92	2.15
Jawa	5.39	4.47	2.25	5.19	2.49
Bali & Nusa Tenggara	4.63	3.27	2.53	4.46	1.94
Kalimantan	3.06	2.65	2.46	2.67	1.73
Sulawesi	4.22	3.95	2.94	4.13	1.85
Maluku & Irian Jaya	-	-	-	-	-
Indonesia	4.96	4.04	2.67	4.57	2.19

Source: JICA-FIDP team calculation based on Agricultural Survey Production of Cereals 1991, CBS

Paddy yield differs among island groups as well as eco-system. Paddy yield under irrigated field is higher than rainfed field and other field Although cultural practice is different, yield differences among eco-systems are 0.8 ton per ha between irrigated and rainfed field and 1.7 ton per ha between rainfed and other field. The yield of upland paddy is always lower than that of lowland paddy grown under any ecosystem. Even under the irrigated field condition there is a significant difference in the yield among the islands and among the provinces. The highest yield is attained in Jawa while the lowest in Kalimantan. This may due to the difference in the level of farming practice and used varieties as well as level of farm input such as fertilizer. There are considerable difference in the level of fertilizer between Jawa and Kalimantan as mentioned later. The yield of paddy plant grown under other area is extremely low. The difference in the yield of lowland paddy under other field and of upland paddy among the island and among the provinces are not as big as that under irrigated and rainfed field. Farmers will not invest with farm inputs unless environment on production is stable.

3.5.2 Comparison of Paddy Yield by Type of Irrigation

The grain yield (yield) of paddy plant grown under different ecosystem and different type of irrigation system is considered to be different. The cultural practice and the amount of farm input is also different among the different environment of paddy cultivation . In order to know the difference in the yield of lowland paddy grown under different irrigation system and ecosystem, statistical analysis was carried out using the data of some 9000 crop cutting test in Indonesia done by CBS in the first season of 1991. Since the amount of application of fertilizer is another important factor determining the yield, the effect of fertilizer level on the paddy yield as well as the interaction effect of irrigation type and fertilizer level on the yield were statistically analyzed by using factorial analysis of variance method. Details of data

screening and processing are presented in Appendix B. The result of the statistical analysis is shown below.

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Probability>F
Model	49	10,392.8	212.1	111.0	0.0000
Irrigation level	4	598.3	149.6	78.3	0.0000
Fertilizer level	7	1,693.4	241.9	126.48	0.0000
Irrigation * Fertilizer	28	202.6	7.234	3.782	0.0000
Others	10	7,898.6			
Error	8,931	17,067.8	1.91		
C Total	8,980	27,460.7			

Source: JICA-FIDP team calculation based on the crop cutting data by CBS done in 1991.

When the yield difference is considered to be significant, F-value (F ratio) at more than 95% probability should be required. The result of analysis shows there is a significant difference in the yield among different irrigation type and among fertilizer level, and the interaction effect of irrigation type and fertilizer level on the yield is significant with a probability at more than 99.9%. The difference in the mean yield among different irrigation type is tested by Fisher's least-significant-difference test and result shown below:

Result of Statistical Analysis (t-test) on the Yield of Paddy Grown under Different Type of Irrigation

Level of Irrigation	Technical	Semi-technical	Simple	Village	Non-irrigation
Technical	1.000				
Semi-technical	0.298[n]	1.000			
Simple	0.001	0.006	1.000		
Local	0.000	0.000	0.000	1.000	
Non-irrigated	0.000	0.000	0.000	0.000	1.000

Note: Numerals show the probability of hypothesis in which there is no yield difference in the yield between two different irrigation type. When the value is less than 0.05, there is a significant difference between the two different irrigation type.
Source: JICA-FIDP team calculation based on the crop cutting data by CBS done in 1991.

The result of the analysis indicates that there is a significant difference in the mean yield of paddy plant grown under among different types of irrigation, however, there is not significant difference in the mean yield between technical irrigation and semi-technical irrigation system. The highest yield is found in technical and semi-technical irrigation area, followed by simple irrigation area and the lowest in no irrigation area. The relative yield of paddy plant grown under the different irrigation type is shown below. The paddy yield increases with upgrading of irrigation facility and by providing irrigation facility

Relative Yield of Paddy under Different Type of Irrigation

Level of Irrigation	Technical	Semi-technical	Simple	Village
Non-irrigated =100	145.0	135.6	122.9	114.8

Note: Yield difference among irrigation type is statistically significant at more than 95% probability.
Source: JICA-FIDP team calculation based on the crop cutting data by CBS, 1992

A significant difference in the paddy yield among the different amount of fertilizer application as shown below.

Result of Statistical Analysis (t-test) on the Yield of Paddy under Different Fertilizer Level

	Fertilizer level (kg/ha)	1	2	3	4	5	6	7	8	Yield (ton/ha)
1	0	1.000								3.41
2	1 - 150	0.000	1.000							4.89
3	151 - 250	0.000	0.000	1.000						5.48
4	251 - 350	0.000	0.000	0.000	1.000					5.95
5	351 - 450	0.000	0.000	0.000	0.000	1.000				6.52
6	451 - 550	0.000	0.000	0.000	0.000	0.022	1.000			6.73
7	551 - 650	0.000	0.000	0.000	0.0001	0.070	0.001	1.000		6.57
8	651 - 800	0.000	0.000	0.000	0.000	0.089	0.690	0.009	1.000	6.80

Note: Numerals show the probability of hypothesis in which there is no difference in the yield between two different fertilizer level. When the value is less than 0.05, there is a significant difference between the two different fertilizer level.

From the above, the yield increases proportionally with an increase of fertilizer application up to 450 kg per ha. In the case of fertilizer application exceeding 450 kg per ha, yield response to fertilizer application becomes moderate and in the case of more than 550 kg per ha, yield increase seems to be negligible. The relationship between the yield and the amount of fertilizer application is shown below, and the Figure shows that the yield increases with an increase of fertilizer application up to around 570 kg per ha.

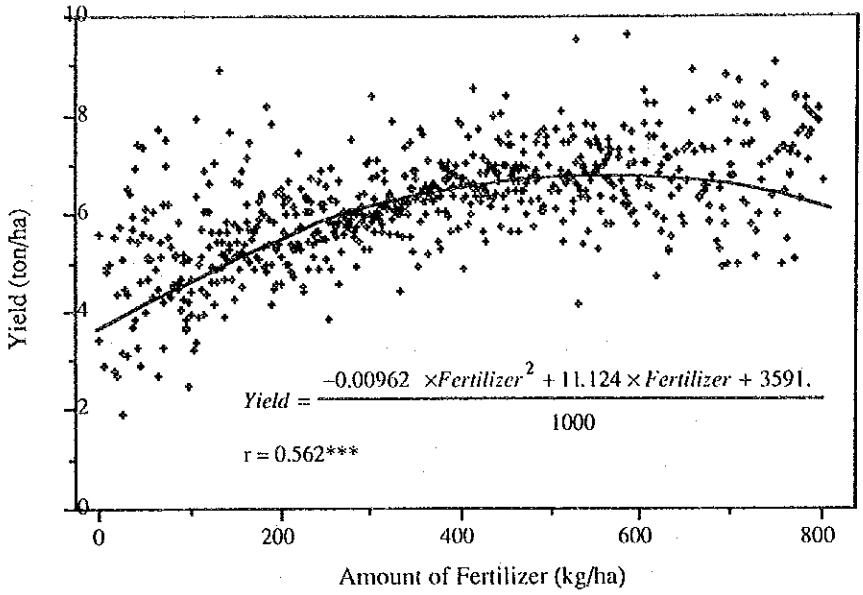


Figure: Amount of Fertilizer vs Paddy Yield

Considering the share of urea in the total amount of fertilizer (about 60 to 70% of total) and recent diffusion of ammonium sulfate in Indonesia, the paddy yield mostly depends on the application of nitrogen fertilizer. By the past experimental data at national research institution or international institution such as IRRI, the maximum yield level can be attained at nitrogen level of about 180 to 200 kg per ha. From the farmers economical point of view, however, fertilizer application level is to be optimum about 450 kg per ha which are already almost attained in Jawa and Bali.

As stated before, the single effect of irrigation and fertilizer on paddy yield increase is proved. However, contribution extent of each factor to yield is not clear. Fertilizer application level is also different among irrigation type as shown below:

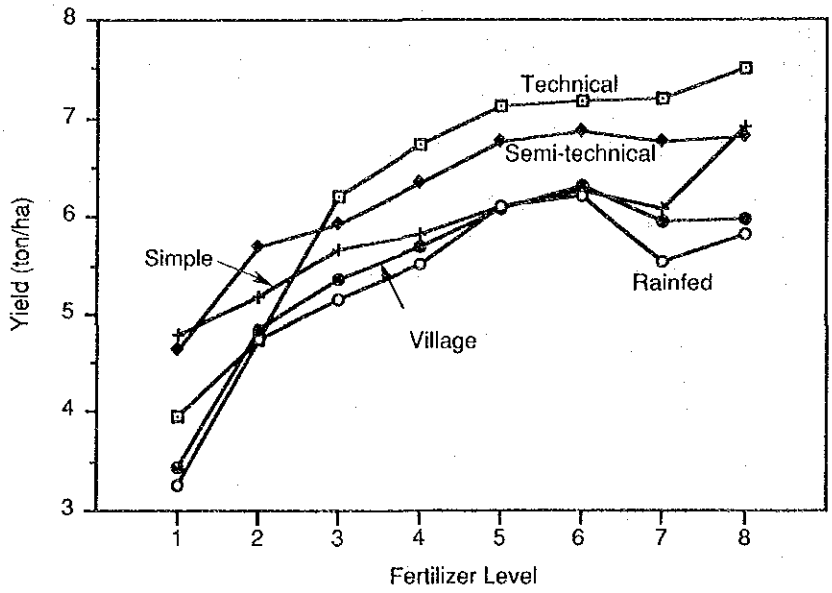
Fertilizer Application Rate under Different Type of Irrigation

Level of Irrigation	Technical	Semi-technical	Simple	Village	Non-irrigated
Fertilizer (kg/ha)	423	380	336	300	202

Note: Difference in fertilizer application rate among irrigation type is statistically significant at more than 95% probability.
Source: JICA-FIDP team calculation based on the crop cutting data by CBS, 1992

Irrigation development is always accompanied by the increase of fertilizer application, which helps to maximize the effect of irrigation. Irrigation investment is a necessary cost for farmers to invest more farm input for production increase. The interaction effect of irrigation

type and fertilizer application on the paddy yield is also found. Result is shown in following figure.



Note: Fertilizer level is shown in page B-25.

Figure Effect of interaction of irrigation and fertilizer on paddy yield

In the case of the amount of fertilizer application exceeding 250 kg per ha (more than level 3), a significant difference in paddy yield is found among technical, semi-technical, simple and village irrigation and non irrigation, however, no significant difference in the paddy yield between technical and semi-technical, without considering fertilizer application. The yield is statistically increased with an upgrading of irrigation facility In the case of fertilizer application being 251 to 550 kg per ha, no significant difference in the paddy yield is found among rainfed, village irrigation and simple irrigation. When the amount of fertilizer application is less than level 3 (less than 250kg/ha), there is no definite relationship between the yield and irrigation type. The effect of irrigation facility is obvious only under higher fertilizer level.

As mentioned above, the paddy yield is increased with improving irrigation facility as well as increasing fertilizer application. The intensification programme, especially SUPRA INSUS, is carried out mainly in technical or semi-technical irrigation area, then the amount of fertilizer application is higher in this area. The upgrading of irrigation facility can truly contribute the yield, however, it is very difficult to determine the single effect of upgrading of irrigation facility to yield, because the upgrading of irrigation facility always accompanied by increase in fertilizer application and improved cultural practices.

3.6 Production of Lowland Paddy

The amount of production of lowland paddy by different ecosystem and by province is shown in Tables 3.20 to 3.22, and summarized as below:

Paddy Production under Different Ecosystem (000 ton) 1989

Province/Island	Lowland Paddy				Upland
	Irrigated	Rainfed	Other	Whole Area	Paddy
Sumatera	5,535	1,905	768	8,208	858
Jawa	20,967	5,173	31	26,172	839
Bali & Nusa Tenggara	1,990	149	15	2,155	142
Kalimantan	490	480	727	1,698	398
Sulawesi	2,952	1,080	29	4,061	101
Maluku & Irian Jaya	-	-	-	-	-
Indonesia	31,935	8,788	1,570	42,293	2,338

Source: JICA-FIDP team calculation based on Agricultural Survey Production of Cereals 1989, CBS

Paddy Production under Different Ecosystem (000 ton) 1990

Province/Island	Lowland Paddy				Upland
	Irrigated	Rainfed	Other	Whole Area	Paddy
Sumatera	4,897	2,559	1,149	8,606	808
Jawa	21,728	4,551	23	26,301	877
Bali & Nusa Tenggara	1,977	174	9	2,160	154
Kalimantan	510	555	691	1,756	407
Sulawesi	2,912	978	43	3,933	95
Maluku & Irian Jaya	-	-	-	-	-
Indonesia	32,023	8,816	1,915	42,756	2,541

Source: JICA-FIDP team calculation based on Agricultural Survey Production of Cereals 1990, CBS

Paddy Production under Different Ecosystem (000 ton) 1991

Province/Island	Lowland Paddy				Upland
	Irrigated	Rainfed	Other	Whole Area	Paddy
Sumatera	5,584	2,197	934	8,714	788
Jawa	21,282	4,261	31	25,555	837
Bali & Nusa Tenggara	2,044	127	2	2,173	153
Kalimantan	406	636	728	1,790	465
Sulawesi	3,116	846	32	3,994	100
Maluku & Irian Jaya	-	-	-	-	-
Indonesia	32,431	8,068	1,726	42,226	2,345

Source: JICA-FIDP team calculation based on Agricultural Survey Production of Cereals 1991, CBS

The amount of total lowland paddy production in Indonesia in 1989 is about 42 million ton, more than 60% of which or 26 million ton is produced in Jawa, and that of upland paddy is about 2 million ton in 1989. In outside of Jawa, the largest production is found in Sumatera and followed by Sulawesi, the amount of lowland paddy production in other area is very small. From the view point of ecosystem, about 75% of the production of lowland paddy or 32 million ton is produced in irrigated area, 21% or 8.7 million ton in rainfed area, and only 4% or 1.7 million ton in swamp area. Same trend of paddy production is found in 1990 and 91. Since total paddy production in Indonesia is about 45 million ton and the ratio of lowland paddy production to total paddy production is about 95%, the contribution of paddy production in irrigated area to total paddy production is as high as 71%. In addition, it is easier to increase the yield in irrigated area than in rainfed or swamp area, through increase of input, introduction of modern varieties, etc.

3.7 BIMAS Programme and Its Contribution to Paddy Production

3.7.1 BIMAS Programme

BIMAS or agricultural intensification programme is a programme for increasing production by a system which covers intensification of paddy, maize, soya beans, mina paddy (fish and paddy cultivation), working cattle and local chicken. Agricultural intensification programme is implemented in all the area of the farm operation either lowland area, upland, swamp, house garden or newly opened area (transmigration, land development, special land for nuclear small estate) and land conservation, rehabilitation and reforestation. Agricultural intensification is an effort of application of agricultural knowledge and technology into farm management practice to improve the productivity of not only crops but also animal husbandry and fishery by considering the conservation of natural resources.

BIMAS programme is composed of ordinary intensification programme (Inmum) and special intensification programme (Intensifikasi Khusus). Special intensification programme is a programme which is carried out by a union of operation of farmers group on improving cultural practice of crops. Super special intensification programme (Supra Insus) is an integrated form of Insus which covers a large area and some farmers groups.

3.7.2 The Effect of BIMAS Programme on Paddy Yield

The yield of paddy under intensification programme is much higher than that of paddy under non-intensification in all the provinces and the islands as shown below (also refer to Table 3.23).

Area and Yields of Lowland Paddy under Intensification and Non-intensification Programme in 1989

Province/Island	Area ('000 ha)		Yield (ton/ha)	
	Intensification	Non-intensification	Intensification	Non-intensification
Sumatera	2,113	188	4.01	2.88
Jawa	5,446	6	5.14	2.98
Bali & Nusa Tenggara	470	58	4.58	2.91
Kalimantan	534	125	2.78	2.18
Sulawesi	974	45	4.17	2.60
Maluku & Irian Jaya	-	-	-	-
Indonesia	9,546	423	4.63	2.67

Source: Cost Structure of Farms Paddy and Palawija, 1989, CBS
Statistik Intensifikasi Pertanian (1990), BIMAS, MOA

There is a big difference in the paddy yield under the intensification programme among the provinces and among the islands, however, there is no big difference in the yield under non-intensification among the provinces and among the islands. One of the reason why there is a big difference in the yield under intensification programme among the provinces can be understood that there is a big difference in the amount of fertilizer application and in the value of farm input among the provinces. There is a high positive correlation coefficient ($r=0.859$, $p<0.001$) between the yield and the amount of fertilizer application as shown in Figure 3.1. There is also a high positive correlation coefficient ($r=0.921$, $p< 0.001$) between the yield and the value of farm input. The correlation coefficients between the yield and the total amount of application of fertilizer or that of urea and between the yield and the value of farm input are highly significant in every year from 1982 to 1989.

On the other hand, there is no big difference in the yield among the provinces under non-intensification. This suggests there is no big difference in the paddy productivity of the lowland paddy field as well as cultural practice and farm input among the provinces. Therefore, the difference in the yield under intensification programme among the islands or provinces may be due to the difference in cultural practices, the amount of fertilizer application, used variety and environment of paddy field such as irrigation and land leveling.

Historical change in the yield of paddy in Indonesia under intensification programme is shown in Table 3.24. The yield under intensification programme shows an increasing tendency at a n average annual rate of 30 kg per ha, which is much smaller than that of whole field (88 kg per ha). It is not curious that while no distinct yield increase is attained under intensification programme, physical area under intensification programme has increased, which contributed much to increase of yield. The amount of fertilizer application also increases year by year as shown in Table 3.25. There is a big difference in the annual increasing rate of yield under intensification programme among the islands and among the provinces. An average annual increasing rate is the highest in Jawa with 68 kg per ha and the lowest in Kalimantan with only 1 kg per ha. On the other hand, there is no significant change in the paddy yield under non-intensification during the last eight years.

3.7.3 Extension of Area under BIMAS Programme

The change in paddy area under intensification programme is shown in Table 3.26. The paddy area under intensification programme has increased year by year, with an annual rate of 443 thousand ha ($r=0.926$, $p<0.001$). The area ratio of intensification programme to whole paddy area has also increased in recent eight years, from 71% to 96%. Historical change in the paddy production under intensification programme is shown in Table 3.27. The average annual increase of paddy production under intensification programme, 1.99 million tons ($r=0.958$, $p<0.001$), exceeds that of whole area (1.31 million tons; refer to page B-8, also Table 2.1).

The yield of lowland paddy in Indonesia and in all the islands are significantly correlated with the area ratio of intensification programme to whole area, correlation coefficients are 0.956 for Indonesia, 0.984, 0.843, 0.872, 0.907 and 0.860 ($p<0.001$) for Sumatera, Jawa, Bali and Nusa Tenggara, Kalimantan and Sulawesi, respectively. From above-mentioned fact, it can be easily understood that an increase in the amount of paddy production depends largely on the extension of area under intensification programme. The total paddy area under intensification in 1988/89 and 1989 is summarized as below.

Area under Intensification Programme by Type (1988/89 and 1989)

Province/Islands	Lowland paddy ('000 ha)				Upland paddy ('000 ha)	
	Supra Insus	Insus	Inmum	Total	Intensif.	Non-intensif.
Sumatera	429	1,155	529	2,113	325	46
Jawa	1,510	3,318	541	5,446	318	1
Bali & Nusa Tenggara	97	235	138	470	16	46
Kalimantan	0	221	313	534	40	99
Sulawesi	226	446	301	974	27	9
Maluku & Irian Jaya	0	7	1	8	10	0
Indonesia	2,261	5,382	1,825	9,546	737	200

Source: BIMAS

The harvested area of lowland paddy field under intensification programme is 9.5 million ha or 95% of total harvested paddy area (refer Table 3.23). The lowland paddy area under intensification is the largest in Jawa, followed by Sumatera. On the other hand, the paddy area under non-intensification is the largest in Sumatera followed by Kalimantan (refer Table 3.23). The area ratio of intensification to total paddy area is the highest in Jawa at 99.9% and the lowest in Kalimantan at 80%. Out of intensification programme, 2.26 million ha or 24% of total is under Supra Insus, 5.38 million ha or 56% of total under Insus and 1.83 million ha or 20% under Inmum. The paddy area under Supra Insus is the largest in Jawa, 1.5 million ha or 66% of total, followed by Sumatera, at 0.4 million ha or 20%. The paddy area under Insus is also the largest in Jawa, 3.3 million ha or 60% of total, followed by Sumatera, 1.2 million ha or 21.%. The paddy area under special intensification programme is situated almost in Jawa and Sumatera. The paddy area under Inmum is distributed in all the Islands.

3.7.4 Comparison of the Type of Intensification Programme

The paddy yield is different by the type of intensification programme, as shown in below:

Historical change of yield under the intensification program by type

Unit: ton/ha

Type of Intensification	1982	1983	1984	1985	1986	1987	1988	1989
Supra-insus	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.28
Insus	4.77	4.86	4.87	4.83	4.87	4.81	4.86	4.76
Inmum	4.00	4.01	4.01	3.98	3.86	3.91	3.78	3.65
Intensification Total	4.36	4.45	4.45	4.44	4.44	4.48	4.54	4.63
Non-intensification	2.77	2.80	2.76	2.74	2.64	2.60	2.65	2.67

Source: BIMAS

The yield under Insus is always higher than that under Inmum. Under the Supra Insus and Insus, credit system gives higher yield than Self-finance system as shown below:

Paddy yield and fertilizer applied amount under the different types of intensification program

	Supra-insus		Insus		Inmum		Total Intensification		Non-
	credit	self-finance	credit	self-finance	credit	self-finance	credit	self-finance	Intens.
Year 1988									
Yield (ton/ha)	-	-	5.05	4.83	3.48	3.79	5.02	4.49	2.65
Fertilizer (kg/ha)									
Urea	-	-	215	235	110	165	212	212	3
TSP	-	-	112	119	56	104	111	114	2
Others	-	-	71	28	11	11	70	22	0
Total	-	-	397	382	176	280	393	349	5
Year 1989									
Yield (ton/ha)	5.47	5.22	5.10	4.73	3.58	3.65	5.30	4.56	2.67
Fertilizer (kg/ha)									
Urea	259	225	224	224	154	162	246	220	1
TSP	133	117	104	109	71	82	125	108	1
Others	84	53	72	39	33	12	79	40	0
Total	475	395	400	373	258	256	449	368	2

Source: BIMAS

Under Inmum, however, credit system does not always give higher yield than self-finance system. The paddy yield seems to be affected by the amount of application of fertilizer, and the more the amount of fertilizer application, the more the yield is observed regardless of type of intensification.

3.7.5 Intensification Programme for 1992 and 1992/93

The target area of intensification of paddy by type of intensification for 1992 and 1992/93 cropping seasons are summarized as below:

Target Area under Intensification Programme by Type (1992 and 1992/93)

	Lowland paddy ('000 ha)				Upland paddy ('000 ha)			Grand
Province/Islands	Supra Insus	Insus	Inmum	Total	Insus	Inmum	Total	Total
Sumatera	751	1,032	348	2,131	201	123	324	2,455
Jawa	2,320	2,628	129	5,077	127	123	249	5,326
Bali & Nusa Tenggara	205	242	66	513	10	12	22	535
Kalimantan	22	367	299	688	14	60	74	762
Sulawesi	277	528	176	981	8	21	29	1,010
Maluku & Irian Jaya	0	11	16	27	0	18	18	45
Indonesia	3,575	4,808	1,034	9,417	360	357	716	10,133

Source: BIMAS

Although the total area under the intensification programme as compared with that of 1989, level of intensification is much improved in 1992 and 1992/93 plans. Supra Insus programme is increased by 1.3 million ha from 2.26 million ha in 1988/89 and 1989 to 3.58 million ha in 1992 and 1992/93 programme. Jawa (increased by 0.81 million ha) and Sumatera (increased by 0.33 million ha) contribute much to this grade up of the programme. With an increase in area under Supra Insus, area under Insus and Inmum decrease. Area target of intensification of paddy for respective year of 1992 and 1992/93 cropping seasons are separately presented below:

Target Area of Intensification of Paddy by Type of Intensification (1992)

Unit: '000 ha

Province/Island	Supra Insus			Insus			Inmum			Total		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Sumatera	316	0	316	326	48	374	99	58	157	741	105	846
Jawa	943	0	943	812	0	812	19	0	19	1,773	0	1,773
Bali & Nusa Tenggara	77	0	77	71	0	71	6	2	7	154	2	156
Kalimantan	10	0	10	111	0	111	131	16	148	252	16	268
Sulawesi	105	0	105	275	3	277	102	9	111	482	11	493
Maluku & Irian Jaya	-	-	-	3	0	3	3	5	8	6	5	12
Indonesia	1,450	0	1,450	1,598	50	1,649	360	90	450	3,409	140	3,549

Note: (1): Lowland paddy; (2): Upland paddy; (3): Total
Source: BIMAS

Target Area of Intensification of Paddy by Type of Intensification (1992/93)

Unit: '000 ha

Province/Island	Lowland									Upland			Grand Total
	Supra Insus	Insus				Inmum				Insus	Inmum	Total	
	(1)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)				
Sumatera	435	589	9	108	706	164	4	81	249	153	65	218	1,608
Jawa	1,377	1,754	62	0	1,816	107	3	0	110	127	123	249	3,552
Bali & Nusa Tenggara	128	135	36	0	171	53	7	0	60	10	10	20	379
Kalimantan	12	156	0	100	256	113	0	54	168	14	44	58	494
Sulawesi	172	253	0	0	253	74	0	0	74	5	12	17	516
Maluku & Irian Jaya	0	8	0	0	8	13	0	0	13	0	13	13	34
Indonesia	2,124	2,896	106	208	3,210	525	14	136	675	309	266	574	6,582

Note: (1): Lowland Paddy; (2): Paddy Gora (3): Swamp paddy; (4): Total
Source: BIMAS

The target area of intensification of lowland paddy 1992 (dry season) is 1.5 million ha for Supra Insus and 1.6 million ha for Insus. That of intensification of lowland paddy in 1992/93 (wet season) is 6.0 million ha, 2.1 million ha for Supra Insus, 3.2 million ha for Insus and

0.67 million ha for Inmum. The area ratio of Supra Insus to total intensification is higher in dry season than in wet season, because Supra Insus is applied mainly in irrigated area.

Intensification programme is mainly applied in sawah area, only in Kalimantan and some province of Sumatera, Sumatera Selatan, Jambi and Riau, it applied in swamp paddy field.

The target area of intensification of upland paddy in 1992 is 0.14 million ha, it distributed mainly in Sumatera. That of upland paddy in 1992/93 is 0.6 million ha and 90% or 0.46 million ha is distributed in Sumatera and Jawa.

4. Direction of Paddy Production Increase

4.1 Analysis of Contribution Factor to Production Increase

4.1.1 Contribution Factors to Increase Production

As stated before, the amount of production of lowland paddy in Indonesia has significantly increased during the period from 1980 to 1991 at a yearly rate of 1.3 million ton (Tables 2.1 and 4.1). The production of paddy (P) is presented by the product of the harvested area (H) and the yield (Y). When the production increases, the harvested area or the yield should increase, or both of them should increase. In Indonesia, both of the harvested area and the yield have significantly increased (Tables 2.1, 4.2 and 4.3). The contribution of change of the harvested area and the yield to the increase of paddy production is determined by following calculation:

$$P_n/P_o = H_n/A_o \times H_n/Y_o \qquad (1)$$

Where P_n, H_n and Y_n are the amount of production, harvested area and yield of paddy at nth years after the starting year, respectively, and P_o, H_o and Y_o are the production, harvested area and yield of paddy at a base year.

Formula (1) can be converted into following Formula:

$$\text{Log } P_n/P_o = \text{Log } H_n/A_o + \text{Log } H_n/Y_o$$

The values of Log H_n/H_o and of Log Y_n/Y_o indicate the contribution of the change of the harvested area and of the yield to the change of the amount of production. The larger the value, the higher the contribution to the paddy production is presented. In the case that the value of Log H_n/H_o or Log Y_n/Y_o shows 2.000, there is no change in the harvested area and the yield. In the case of the values being less than 2.000, the harvested area or the yield decreases and in the case of the values being more than 2.000, the harvested area or the yield increases. When Log H_n/H_o is larger than Log Y_n/Y_o, the contribution of the change of the harvested area to the change of the amount of production is higher than that of the yield to the change of yield. The contribution of the change of the harvested area and of yield to the increase of paddy production is shown in Table 4.4, and summarized as below.

Assessment of contributor to production increase by islands

/Island	Log P_n/P_o	Log H_n/H_o	Log Y_n/Y_o
Sumatera	4.241	2.137	2.104
Jawa	4.152	2.030	2.086
Bali & Nusa Tenggara	4.166	2.058	2.108
Kalimantan	4.129	2.058	2.071
Sulawesi	4.270	2.134	2.136
Maluku & Irian Jaya	5.178	3.040	2.138
Indonesia	4.179	2.068	2.111

Remarks: Base Year : 1980, nth year: 1991
Source: Developed from Production of cereals, CBS, 1980 and 1991 by JICA-FIDP team

In Indonesia, the contribution of the change in the harvested area to the paddy production is smaller than that of yield to the paddy production. There is a big difference in the contribution of the harvested area and of the yield among the islands and among the provinces. In Indonesia, the paddy production area is classified into three groups by analysis of the yield increase pattern, i.e., (1) the contribution of the change of the harvested area to the production is much more than that of the yield to the production, (2) the contribution of the change of the yield to the production is much higher than that of the harvested area and (3) there is no big difference in the contribution to the paddy production between the changes in the harvested area and the yield. Sumatera and Maluku and Irian Jaya belong to the first group, Jawa and Bali and Nusa Tenggara belong to the second group and Kalimantan and Sulawesi belong to the third group. In the first group the increase in paddy production is largely supported by the increase in the harvested area, on the other hand, in the second group, the increase in paddy production is mainly supported by increase in the yield.

In Sumatera, Sumatera Barat and Jambi belong to the second group where the contribution of the yield increase to the paddy production is much higher than that of the harvested area to

paddy production and almost all of other provinces belong to the first group where the contribution of the increase in harvested area to the paddy production is much higher than that of yield to the paddy production, however, in this group the contribution of yield increase to the paddy production is obviously observed.

In Jawa, all the provinces belong to the second group and the contribution of the increased in harvested area to the paddy production is obvious in all the provinces except DKI Jakarta and Yogyakarta in which the harvested area has decreased.

In Bali and Nusa Tenggara, Bali and Nusa Tenggara Barat belong to the second group. In Bali, the increase in paddy production is only supported by the yield increase, however, the contribution of the increase in the harvested area is also high in Nusa Tenggara Barat. Nusa Tenggara Timur belongs to the third group.

In Kalimantan, Kalimantan Barat and Kalimantan Timur belong to the second group and Kalimantan Tengah and Klimantan Selatan belong to the third group. An average annual increasing rate presented by percentage in paddy production is the lowest in Kalimantan.

In Sulawesi, Sulawesi Utara Sulawesi Tengah and Sulawesi Tenggara belong to the first group and Sulawesi Selatan belong to the second group. In the first group, however, the contribution of the change in the yield is obvious and in the second group, the contribution of change in the harvested area is also obvious.

As stated above, the contribution of the harvested area and the yield to the paddy production is different among the islands and among the provinces. However, there is found a high positive correlation coefficient between the values of Log P_n/P_o and of LogH_n/H_o at the level of Islands and that of provinces ($r=0.996$ and 0.994, $p<0.001$, at islands and province level, respectively) and there is no relationship between the value of Log P_n/P_o and of LogY_n/Y_o. This fact means that the increase of paddy production is mainly supported by the increase of the harvested area. There is also observed a highly positive correlation coefficient between the amount of production increased and the harvested area increased ($r= 0.920$, $p< 0\ 001$), however, no significant correlation ship is observed between the amount of paddy production increased and the increased yield. From above-mentioned fact, it can be understood that it is important to increase harvested area for increasing paddy production, and it is easier to increase harvest area as compared with the other measure to increase yield.

4.1.2 Contribution Factor to Increase of Harvested Area

The harvested area in Indonesia has significantly increased during the period from 1980 to 1991 with an average annual increasing rate of 143 thousand ha. The harvested area (H) is presented by the product of the field area (F) and cropping intensity (CI_h). When the harvested area increases, the field area or CI_h should increase, or both of them should increase. In Indonesia, the field area of lowland paddy field has increased at a yearly increasing rate of 140 thousand ha, on the other hand, the increase in the CI_h is very small and no significant. Therefore, it can easily said that the increase in the harvested area is largely supported by the increase in field area.

The change in the harvested area is presented a following formula:

$$H_n/H_o = F_n/F_o \times CI_{hn}/CI_{ho} \qquad (1)$$

Where H_n, F_n and CI_{hn} are the harvested area, the field area and cropping intensity in a definite year, n years after the base year, respectively, and H_o, F_o and CI_{ho} are the harvested area, field area and CI_h in the starting year. Formula (1) can be converted to following formula:

$$\text{Log } H_n/H_o = \text{Log } F_n/F_o + \text{Log } CI_{hn}/CI_{ho}$$

The values of $\text{Log}F_n/F_o$ and $\text{Log } CI_{hn}/CI_{ho}$ indicate the contribution of the change in the field area and in CI_h to the change in the harvested area. The larger the value, the higher the contribution to the harvested area. When the value of $\text{Log } F_n/F_o$ is larger than that of CI_{hn}/CI_{ho}, the contribution of the change of the field area is larger than that of CI_h. In Indonesia, the increase in the harvested area is largely affected by the increase in field area (Table 4.5 and the following Table).

Assessment of relative importance of contributors to field area increase by islands

Province/Island	Log H_n/H_o	Log F_n/F_o	Log CI_{Hn}/CI_{Ho}
Sumatera	4.088	2.050	2.038
Jawa	4.033	1.998	2.035
Bali & Nusa Tenggara	4.037	2.047	1.991
Kalimantan	4.072	2.174	1.898
Sulawesi	4.129	2.064	2.065
Maluku & Irian Jaya	-	-	-
Indonesia	4.058	2.046	2.013

Remarks: Base Year : 1983, nth year: 1991
Source: developed from Production of cereals and Land area utilization, CBS, 1983 and 1991 by JICA-FIDP team

The field area of lowland paddy field has significantly increased in Sumatera, Bali and Nusa Tenggara, Kalimantan and Sulawesi at a yearly rate of 48, 8, 72 and 15 thousand ha, however, in Jawa, The increasing tendency of lowland paddy field is observed but non significant. The CI_h has significantly increased in Sumatera Jawa and Sulawesi, on the other hand, it has significantly decreased in Kalimantan. There is no change in CI_h in Bali and Nusa Tenggara. Therefore, there is a big difference in the contribution of the field area and CI_h to the harvested area among the Islands.

In Indonesia, paddy area can be classified into three groups by analysis of the harvested area increasing pattern, i.e., (1) the contribution of the change in field area is much larger than that of CI_h (2) the contribution of the change in CI_h is much higher than that of the field area and (3) there is no big difference in the contribution to the harvested area between the change in the field area and CI_h. Sumatera, Kalimantan and Bali and Nusa Tenggara belong to the first group, Jawa belongs to the second group and Sulawesi belongs to the third group.

In the period, From 1983 to 1991, about 80% of increased paddy field or about 640 thousand ha is in swamp and other ecosystem and only 30% or 250 thousand ha is in irrigation ecosystem. In the area belong to the first group, a larger part of the increased paddy field is in swamp ecosystem where the CI_h is very low compared with other . From the view point of paddy production, the 640 thousand ha of increased paddy area in swamp ecosystem can be assumed to be equivalent to 100 thousand ha of irrigated paddy field or the preparation of irrigation facility for 220 thousand ha of rainfed paddy field.

4.2 Analysis of Production Increase Potential

4.2.1 Yield Increase Potential

The yield has increased during the recent twelve years in almost of provinces, as stated before. The paddy area is classified, by the view point of yield, to three or four groups by the yield of 1989 to 91 and the average annual increasing rate of yield during the recent twelve years, i.e. (1) the high yield or relatively high yield with high increasing rate of yield, (2) the high or relatively high yield with relatively high increasing rate of yield, (3) low or relatively low yield with high or relatively high increasing rate of yield and (4) low or relatively low yield with low increasing rate of yield. There is a significant correlation ship between the average yield of 1989 to 1991 and an average annual increasing rate of yield ($r= 0.833$, $p<0.001$). Generally speaking the higher the yield, the higher the increasing rate of yield is

observed with few exceptions. In the case of being high yield area, the average annual increasing rate is always high, however, in the low yield area, there is observed high and low yearly increasing rate of yield. Referring to the past trend in yield change, provinces are categorized into the above groups as shown below:

First Group:	Sumatera Barat, all the provinces in Jawa except Jawa Timur, Bali, Nusa Tenggara Barat and Sulawesi Selatan.
Second Group:	Lampung, Jawa Timur and Sulawesi Utara
Third Group:	D I Aceh, Sumatera Utara, Riau, Sumatera Selatan, Sulawesi Tengah and Sulawesi Tenggara
Fourth Group:	Jambi, Bengkulu, Sumatera Selatan, Nusa Tenggara Timur, all provinces in Kalimantan

Since there is no big difference in the yield under non intensification area among the islands and among the provinces, it can be said that there is no big difference in the paddy productivity of lowland paddy field among the provinces and the difference in the yield and the average annual increasing rate in the yield may be due to the difference in cultural practice, the amount of fertilizer application, ecosystem of paddy field and the improvement of cultural practice and ecosystem of paddy field. Therefore, it can be understood that there is no big difference in the potential yield of paddy plant grown under each ecosystem among the provinces. Based on the experimental data of agricultural research institute, referring the information on the difference in the environmental condition between the institute and farmers and the technical and socioeconomic constraints, and considering the non transferable technology, the average maximum paddy yield of the irrigated field in Indonesia under present condition can be accounted about 6.5 ton/ha with in several years in future. And the average maximum yield of rainfed and swamp paddy under present condition can be expected as 5.0 and 3.0 ton/ha, respectively.

4.2.2 Trend Growth Projection of Lowland Paddy Production

From above-mentioned analysis, the trend growth projection of harvested area, yield and production of paddy plant in near future is made. For the projection, no big change in agricultural policy and environment of paddy cultivation is assumed. The results are shown in Tables 4.6 to 4.10, Figures 4.1 to 4,.3 and summarized below:

Trend Growth Projection of Harvested Area of Lowland Paddy Field until the Year 2020

unit: 000 ha

	1990	1995	2000	2005	2010	2015	2020
Sumatera	2,155	2,282	2,361	2,459	2,527	2,586	2,639
Jawa	4,995	5,084	5,151	5,203	5,247	5,283	5,307
Bali & Nusa Tenggara	475	483	489	496	502	508	512
Kalimantan	630	645	657	667	674	682	687
Sulawesi	926	991	1041	1,082	1,119	1,150	1,179
Maluku & Irian Jaya	8	12	15	18	21	24	27
Indonesia	9,190	9,497	9,714	9,925	9,916	10,234	10,352

Source: Projected by JICA-FIDP team

Trend Growth Projection of yield of Lowland Paddy Field until the Year 2020

unit: ton/ha

	1990	1995	2000	2005	2010	2015	2020
Sumatera	3.88	4.02	4.13	4.22	4.29	4.35	4.41
Jawa	5.14	5.36	5.52	5.66	5.77	5.86	5.95
Bali & Nusa Tenggara	4.39	4.55	4.67	4.76	4.84	4.91	4.97
Kalimantan	2.69	2.75	2.79	2.83	2.85	2.88	2.90
Sulawesi	4.13	4.32	4.46	4.57	4.67	4.75	4.82
Maluku & Irian Jaya	2.70	2.82	2.91	2.99	3.05	3.10	3.15
Indonesia	4.54	4.71	4.84	4.94	5.3	5.10	5.17

Source: Projected by JICA-FIDP team

Trend Growth Projection of Production of Lowland Paddy until the Year 2020

unit: 000 ton

	1990	1995	2000	2005	2010	2015	2020
Sumatera	8,370	9,189	9,836	10,377	10,846	11,263	11,638
Jawa	25,696	27,266	28,469	29,452	30,290	31,001	31,672
Bali & Nusa Tenggara	2,090	2,211	2,304	2,381	2,446	2,502	2,553
Kalimantan	1,690	1,770	1,831	1,881	1,923	1,959	1,991
Sulawesi	3,830	4,280	4,642	4,851	5,222	5,466	5,688
Maluku & Irian Jaya	22	33	43	53	64	75	85
Indonesia	41,699	44,749	47,125	49,095	50,790	52,265	53,629

Source: Projected by JICA-FIDP team

Trend Growth Projection of Production of Upland Paddy until the Year 2020

unit: 000 ton

	1990	1995	2000	2005	2010	2015	2020
Sumatera	834	881	919	952	982	1,008	1,033
Jawa	860	984	1,084	1,170	1,246	1,314	1,376
Bali & Nusa Tenggara	134	136	139	140	141	142	143
Kalimantan	413	441	462	480	495	508	520
Sulawesi	107	101	98	95	93	91	90
Maluku & Irian Jaya	29	14	11	11	10	10	10
Indonesia	2,360	2,553	2,711	2,847	2,966	3,074	3,173

Source: Projected by JICA-FIDP team

Trend Growth Projection of Production of Paddy until the Year 2020

unit: 000 ton

	1990	1995	2000	2005	2010	2015	2020
Sumatera	9,204	10,069	10,755	11,329	11,828	12,271	12,671
Jawa	26,556	28,250	29,553	30,622	31,536	32,315	33,049
Bali & Nusa Tenggara	2,224	2,347	2,442	2,512	2,587	2,645	2,697
Kalimantan	2,103	2,210	2,293	2,360	2,418	2,467	2,511
Sulawesi	3,938	4,381	4,740	5,046	5,314	5,557	5,778
Maluku & Irian Jaya	34	44	53	63	74	85	95
Indonesia	44,059	47,302	49,836	51,941	53,756	55,340	56,802

Source: Projected by JICA-FIDP team

The amount of production of paddy in 2020 can be projected as of 57 million tons. The amount of production of upland paddy is very low as compared with that of lowland paddy, 5.4% of total production or only 2.4 million tons in 1990 and expected 5.6% of total or 3.2 million tons in 2020. In addition to this, the change in the amount of upland paddy production is also very small compared with that of lowland paddy. Therefore, it is rather difficult to expect the obvious increase of upland paddy production, although the yield of upland paddy has still increased.

The results of rice demand projection made as a part of the FIDP study revealed that some 72 million tons of paddy will be required at the year 2020 to keep self-sufficiency. The gap between demand and supply is then more than 15 million tons in 2020.

It is needless to say that both intensification and extensification should be promoted harmoniously to fill the gap. Irrigation is a tool for stable paddy cultivation with which farmers can invest more farm input to increase productivity.

4.3 Direction of Paddy Production Increase

Through the above-mentioned examination, provinces are classified into three groups according to the various potential factors for increasing paddy production. The characteristics of each group is shown in Table 4.11 and Table 4.12.

The first group (Group I) is characterized by high yield, a high annual increasing rate of yield, a higher contribution of the yield increase to the increase of paddy production, a lower contribution of the increase in the field area to the increase of harvested area and no or very low increasing rate of field area. In the area, since there.is a very limited space for the increment of paddy field, it is very important to increase the yield by employing more intensive paddy cultivation for increasing paddy production, and there is a limited potential for further paddy production.

The third group (Group III) is characterized by low yield, a low annual increasing rate of yield, a higher contribution of the increase of harvested area to the increase of paddy production, a higher contribution of the increase in the field area to the increase of harvested area and a higher increasing rate of field area. In the area, by employing the new high yielding varieties, intensive cultural practice, training the farmers for farming practice and the improvement of water supply system, the yield, CI_h and the harvested area will be able to increase, and then the production of paddy will also increase. There is a big potential for paddy production in the group. However, there is some barriers for increasing the yield due to the shortage of knowledge of farmers for paddy cultivation and of farm input, and unfavourable paddy ecosystem, at present.

The characteristics of the second group (Group II) is intermediate between the first group and the third group. At present, there is a high potential in the area for paddy production, because, there is a some space for increasing paddy field ,the yield and the increasing rate of yield is also relatively high and the ecosystem of paddy field is relatively favourable for paddy production.

As a result of ranking for production increase potential, each province is ranked as Group I to Group III as follows .

Categorization of Provinces by Production and Environment of Paddy

Group I	Group II	Group III
13. Sumatera Barat	11. DI Aceh	14. Riau
31. DKI Jakarta	12. Sumatera Utara	15. Jambi
32. Jawa Barat	18. Lampung	16. Sumatera Selatan
33. Jawa Tengah	52 Nusa Tenggara Barat	17. Bengkulu
34. DI Yogyakarta	71. Sulawesi Utara	53. Nusa Tenggara Timur
35. Jawa Timur	72. Sulawesi Tengah	61. Kalimantan Barat
51. Bali	73. Sulawesi Selatan	62. Kalimantan Tengah
	74. Sulawesi Tenggara	63. Kalimantan Selatan
		64. Kalimantan Timur

Tables

Table 1.1 Agricultural Land Use and the Harvested Area of Major Crops by Province 1989

unit: 000ha

Province	Field area				Harvested area													
	Lowland Paddy	arable upland	Estates	Total	Lowland paddy	Upland paddy	Maize	Cassava	Sweet potatoes	Soya beans	Ground nuts	Green grammes	Vegetables	Estate crops Perenial	Estate crops Annual	Estate crops total	Upland annual crops	Total harvested area
11 D.I. Aceh	323.1	531.0	470.2	1,324.3	292.6	7.3	11.8	7.0	2.5	118.8	16.9	3.2	21.5	330.6	5.2	335.8	194.3	817.5
12 Sumatera Utara	541.8	741.4	1,346.9	2,630.1	599.5	79.9	85.4	37.5	19.3	24.1	23.2	18.4	48.3	1,075.9	4.6	1,080.5	340.7	2,016.1
13 Sumatera Barat	222.6	426.5	313.7	962.8	341.5	13.5	12.0	11.1	4.3	13.9	11.8	4.2	19.7	241.0	27.8	268.8	118.4	700.9
14 Riau	211.9	658.7	1,042.8	1,913.4	96.1	42.1	10.2	10.3	2.5	5.0	3.9	2.3	9.8	905.9	0.5	906.4	86.6	1,088.6
15 Jambi	212.8	457.3	1,143.1	1,813.2	136.2	46.3	6.4	26.2	2.8	5.1	3.5	3.0	12.2	685.2	1.3	686.4	106.7	928.1
16 Sumatera Selatan	458.0	695.3	998.9	2,152.2	341.8	100.8	22.5	33.7	4.9	12.9	14.2	4.8	12.0	949.2	12.5	961.7	218.3	1,509.3
17 Bengkulu	71.5	127.6	195.8	394.9	68.1	20.2	8.6	5.5	3.5	2.7	4.1	1.9	36.4	236.9	0.8	237.7	83.5	388.5
18 Lampung	215.7	714.3	475.5	1,405.5	248.3	110.9	207.2	162.3	2.8	111.6	12.9	8.2	20.3	404.2	22.7	426.9	658.8	1,311.3
Sumatera	2,257.4	4,352.1	5,986.9	12,596.4	2,124.1	421.0	364.0	293.5	42.6	294.0	90.5	46.1	180.2	4,828.9	75.4	4,904.3	1,807.2	8,760.2
31 D.K.I. Jakarta	6.9	5.6	0.0	12.5	8.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	5.2	13.6
32 Jawa Barat	1,194.5	1,029.1	415.4	2,639.0	1,973.7	155.1	118.6	171.8	48.6	64.3	102.6	26.8	197.8	548.2	30.6	578.7	916.1	3,437.9
33 Jawa Tengah	1,010.5	790.7	82.3	1,883.5	1,494.2	62.4	541.2	278.5	23.0	166.0	120.7	65.8	151.9	561.3	145.2	706.5	1,554.7	3,610.2
34 Yoguyakarta	62.6	115.4	0.0	178.0	101.6	40.7	58.0	57.9	1.2	54.2	43.5	0.8	7.4	126.4	9.5	135.9	273.2	501.2
35 Jawa Timur	1,171.3	1,195.1	167.6	2,534.0	1,521.0	91.6	1,112.4	323.6	25.2	396.7	142.2	85.5	114.0	514.6	324.7	839.3	2,615.8	4,651.4
Jawa	3,445.8	3,135.9	665.3	7,247.0	5,098.9	349.6	1,830.3	831.9	98.1	681.2	409.1	178.8	476.0	1,750.5	509.9	2,260.4	5,364.9	12,214.3
51 Bali	94.1	127.7	130.9	352.7	172.6	2.4	52.1	17.0	8.9	22.5	12.3	5.0	26.8	161.7	2.2	163.9	149.2	483.5
52 Nusatenggara Bara	197.2	204.2	22.6	424.0	250.5	17.1	26.6	15.2	8.5	118.3	19.1	37.8	17.6	86.1	16.1	102.2	276.2	612.8
53 Nusatenggara Timu	118.6	581.7	213.7	914.0	67.6	57.5	219.1	89.2	13.4	1.8	9.4	15.7	10.2	318.5	5.0	323.4	421.1	807.1
54 Timor Timur	32.3	106.1	25.9	164.3	na	na	46.4	8.6	2.8	0.4	1.2	2.0	0.8	140.5	0.7	141.2	62.9	203.4
Bali & Nusatenggar	442.2	1,019.7	393.1	1,855.0	490.7	77.0	344.2	130.0	33.5	143.0	42.0	60.4	55.4	706.7	23.9	730.6	909.4	2,106.8
61 Kalimantan Barat	431.5	1,000.2	1,019.3	2,451.0	200.1	102.1	10.9	23.8	3.0	2.5	2.2	0.5	9.4	570.0	0.8	570.8	155.2	925.3
62 Kalimantan Tengal	222.2	290.9	641.8	1,154.9	87.8	52.5	5.6	8.0	2.3	4.0	1.0	0.5	5.1	203.7	2.2	205.8	81.2	372.6
63 Kalimantan Selatar	467.0	284.4	249.5	1,000.9	313.0	22.7	10.5	10.2	2.8	3.0	12.2	1.6	8.1	192.0	6.0	198.0	77.1	582.1
64 Kalimantan Timur	161.6	650.0	288.0	1,099.6	39.3	62.7	5.7	7.7	2.7	3.4	3.3	1.3	11.0	109.3	0.0	109.3	97.9	246.5
Kalimantan	1,282.3	2,225.5	2,198.6	5,706.4	640.2	240.0	32.8	49.7	10.8	12.9	18.8	3.8	33.6	1,075.0	9.0	1,083.9	411.3	2,126.5
71 Sulawesi Utara	66.7	348.2	246.4	661.3	71.7	9.7	76.6	8.3	4.2	23.2	6.0	5.1	14.1	347.2	0.0	347.2	147.1	566.0
72 Sulawesi Tengah	118.4	267.6	668.5	1,054.5	107.6	22.2	15.2	9.7	9.1	6.5	6.1	3.1	10.7	244.7	0.0	244.7	82.6	434.9
73 Sulawesi Selatan	589.3	633.4	361.6	1,584.3	771.5	15.3	230.7	51.3	8.8	23.9	39.3	37.0	29.6	367.1	30.0	397.2	466.0	1,604.6
74 Sulawesi Tenggara	57.0	279.6	369.1	705.7	40.4	11.4	37.6	18.7	3.1	4.4	4.9	2.5	4.9	183.9	2.9	186.7	90.6	314.8
Sulawesi	831.4	1,528.8	1,645.6	4,005.8	991.2	58.7	360.1	88.1	25.3	58.0	56.3	47.6	59.4	1,142.9	32.9	1,175.8	786.2	2,920.3
81 Maluku	3.3	573.2	652.5	1,229.0	3.5	6.8	9.1	11.9	2.4	0.9	2.1	2.3	3.3	275.2	0.0	275.2	38.8	317.5
82 Irian Jaya	8.9	381.6	203.7	594.2	10.9	3.2	3.9	2.8	27.5	8.1	2.1	1.5	7.3	54.9	0.0	54.9	56.4	122.2
Maluku & Irian Jay	12.2	954.8	856.2	1,823.2	14.4	10.0	13.0	14.7	29.9	9.0	4.2	3.9	10.7	330.1	0.0	330.1	95.2	439.7
Indonesia	8,271.3	13,216.8	11,745.7	33,233.8	9,359.5	1,156.2	2,944.2	1,407.9	240.2	1,198.1	620.8	340.6	815.2	9,834.1	651.1	10,485.2	9,374.3	28,567.9

Source:Statistik Indonesia 1989, CBS
Agricultura Agricultural Survey Land Area by Utilization in Java 1989,CBS
Agricultura Agricultural Survey Land Area by Utilization for Outside of Java 1989,CBS
Agricultura Agricultural Survey Production of Cereals in Indonesia 1989, CBS
Agricultura Agricultural Survey Production of Cereals in Indonesia 1989, CBS
Statistik Pe Statistik Perkebunan Indonesia 1989, Directorate General of Estate Crops, MOA

Table 1.2 Harvested Area of Vegetables by Province 1989

unit: ha

Province	SHALLOTS	GARLIC	LEEKS	POTATOES	CABBAGE	MUSTARD GREENS	CARROTS	CHINESE RADISH	KIDNEY BEANS	COW PEAS	CHILI	TOMATOES	EGG PLANT	SNAP BEANS	CUCUMBER	PUMPKIN	SWAMP CABBAGE	SPINACH	TOTAL
11 DI Aceh	690	164	144	336	94	205	0	84	1,073	3,576	6,343	1,675	1,145	161	2,528	130	1,144	1,992	21,484
12 Sumatera Utara	2,625	1,038	1,542	5,783	4,249	2,883	715	391	677	4,749	9,684	2,729	2,863	2,448	2,721	329	983	1,895	48,304
13 Sumatera Barat	1,542	449	535	1,020	938	686	29	107	19	1,611	7,451	1,129	1,194	751	999	91	464	727	19,742
14 Riau	11	0	12	0	0	278	0	55	0	2,042	2,012	317	1,007	132	1,402	483	892	1,126	9,769
15 Jambi	119	27	78	1,788	256	88	0	60	608	1,784	2,682	511	1,330	724	810	78	485	753	12,181
16 Sumatera Selatan	37	1	229	20	81	444	15	158	166	2,277	2,543	1,150	1,608	193	1,435	154	595	898	12,004
17 Bengkulu	653		1,720	1,019	3,953	3,080	1,163	815	1,554	2,751	6,869	3,913	3,064	1,680	2,750	176	369	860	36,389
18 Lampung	222	5	277	326	629	1,483	162	6	183	4,050	6,055	1,469	1,733	718	1,268	109	519	1,079	20,293
Sumatera	5,899	1,684	4,537	10,292	10,200	9,147	2,084	1,676	4,280	22,840	43,639	12,893	13,944	6,807	13,913	1,550	5,451	9,330	180,166
31 DKI Jakarta	0	0	0	0	0	559	0	17	0	765	101	45	249	0	435	0	1,748	1,110	5,029
32 Jawa Barat	12,369	974	13,262	9,708	12,309	11,998	6,841	1,589	17,121	28,472	28,560	10,099	9,788	5,443	20,144	1,116	3,666	4,310	197,769
33 Jawa Tengah	20,158	7,617	3,801	14,684	17,308	5,812	2,340	54	14,972	13,411	31,600	2,126	3,109	7,058	2,474	517	1,201	3,665	151,907
34 DI Yogyakarta	1,001	88	0	44	72	120	0	0	845	1,367	1,982	357	270	242	143	72	57	714	7,374
35 Jawa Timur	16,787	3,202	3,582	7,170	7,831	4,290	2,297	27	3,844	10,671	35,082	2,527	3,643	3,220	3,509	500	2,202	3,562	113,946
Jawa	50,315	11,881	20,645	31,606	37,520	22,779	11,478	1,687	36,782	54,686	97,325	15,154	17,059	15,963	26,705	2,205	8,874	13,361	476,025
51 Bali	1,839	1,636	215	294	1,157	644	199	38	12,341	1,134	3,384	338	59	1,739	1,141	211	133	262	26,764
52 Nusatengarra Barat	5,163	2,195	0	12	453	140	0	0	327	1,798	4,652	1,024	385	29	904	78	338	131	17,629
53 Nusatenggara Timur	1,194	801	45	336	166	526	53	3	1,053	903	619	475	532	238	528	1,739	284	670	10,165
54 Timor Timur	62	60	2	53	114	107	11	0	106	31	93	50	27	24	18	12	44	26	840
Bali & Nusatenggara	8,258	4,692	262	695	1,890	1,417	263	41	13,827	3,866	8,748	1,887	1,003	2,030	2,591	2,040	799	1,089	55,398
61 K Barat	0	0	195	2	2	842	1	285	39	1,981	784	208	742	174	2,386	332	701	727	9,401
62 K Tengah	0	0	63	0	9	140	0	8	6	1,171	779	241	758	44	801	339	257	472	5,088
63 K Selatan	36	5	1	0	18	232	0	0	18	2,035	1,513	392	1,123	101	1,125	611	249	636	8,095
64 K Timur	31	3	224	27	87	1,059	58	24	7	1,934	1,461	557	986	669	1,181	508	739	1,459	11,014
Kalimantan	67	8	483	29	116	2,273	59	317	70	7,121	4,537	1,398	3,609	988	5,493	1,790	1,946	3,294	33,598
71 Sulawesi Utara	654	1	2,381	801	696	430	236		884	881	1,643	2,269	784	651	424	229	502	607	14,073
72 Sulawesi Tengah	1,101	50	51	107	311	368	51	3	174	1,358	1,136	1,919	1,235	217	986	441	425	780	10,713
73 Sulawesi Selatan	3,018	77	835	1,198	1,004	974	289	8	2,839	4,551	3,656	2,994	2,551	1,184	1,090	375	1,462	1,539	29,644
74 Sulawesi Tenggara	120	0	2	0	58	127	0	0	106	1,264	486	716	771	26	302	180	182	598	4,938
Sulawesi	4,893	128	3,269	2,106	2,069	1,899	576	11	4,003	8,054	6,921	7,898	5,341	2,078	2,802	1,225	2,571	3,524	59,368
81 Maluku	153	0	0	43	138	210	0	0	69	381	426	381	339	170	270	112	335	293	3,320
82 Irian Jaya	496	90	85	159	304	608	108	21	205	1,228	687	695	385	284	469	129	602	792	7,347
Maluku & Irian Jaya	649	90	85	202	442	818	108	21	274	1,609	1,113	1,076	724	454	739	241	937	1,085	10,667
INDONESIA	70,081	18,483	29,281	44,930	52,237	38,333	14,568	3,753	59,236	98,176	162,283	40,306	41,680	28,320	52,243	9,051	20,578	31,683	815,222

Source: Agricultural Survey Production of Vegetables in Indonesia 1990, CBS

Table 1.3 Harvested Area of Estate Crops by Province 1989

unit: 000ha

Province	RUBBER	COCONUT	OIL PALM	COFFEE	TEA	CLOVE	TOBACCO	PEPPER	SUGAR CANE	CACAO	CAPOK	CASHEW NUNT	COTTON PLANT	NUTMEG	CASSIAVERA	CASTOR BEAN	CITRONELLA	VANILLA	ROSELLA	ARECA NUT	CANDLE NUT	TOTAL
11 Aceh	47.0	99.9	46.9	60.0	0.0	45.4	0.5	0.4	4.7	1.4	2.3	1.9	0.0	5.1	0.1	0.0	0.0	0.0	0.0	13.7	6.5	335.8
12 Sumatera Utara	343.8	147.6	438.2	66.8	0.0	27.5	3.5	0.1	1.1	26.3	0.2	0.1	0.0	0.3	4.0	0.0	0.0	0.1	0.0	0.5	4.9	1,065.0
13 Sumatera Barat	78.5	76.0	21.6	21.4	1.2	15.5	1.9	0.5	25.9	1.3	0.5	0.0	0.0	2.2	21.8	0.0	0.0	0.0	0.0	0.5	0.0	268.8
14 Riau	340.0	298.8	239.6	11.1	0.0	14.7	0.0	0.1	0.5	0.7	0.2	0.4	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	906.4
15 Jambi	456.9	106.7	34.5	30.4	2.4	8.0	0.6	0.1	0.6	2.7	0.2	0.1	0.0	0.0	43.0	0.0	0.0	0.0	0.0	0.1	0.1	686.4
16 Sumatera Selatan	546.4	57.7	37.1	239.0	1.0	13.5	0.1	49.1	12.4	0.2	0.5	2.7	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.8	961.7
17 Bengkulu	60.6	21.9	27.3	91.9	0.0	28.4	0.3	2.5	0.5	0.7	1.5	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.1	0.5	237.8
18 Lampung	21.3	152.8	10.9	108.6	0.0	64.5	1.1	40.7	20.8	2.8	1.2	0.0	0.0	0.0	0.5	0.0	0.8	0.5	0.0	0.3	0.0	426.9
Sumatera	1,894.6	961.4	856.2	629.2	4.6	217.5	8.0	93.4	66.6	36.2	6.7	5.3	0.0	7.6	72.4	0.0	0.8	0.6	0.0	15.2	12.8	4,888.9
31 DKI Jakarta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32 Jawa Barat	27.9	284.5	16.3	22.7	100.0	74.1	3.9	0.6	26.2	8.5	8.1	2.1	0.0	1.2	0.2	0.0	0.5	0.6	0.0	0.6	0.5	578.7
33 Jawa Tengah	0.2	285.6	0.0	35.2	12.2	111.6	69.6	0.1	63.5	2.3	138.9	37.7	4.2	1.0	0.7	0.2	0.0	1.2	7.7	0.4	0.0	772.1
34 D.I.Yogyakarta	0.0	52.8	0.0	1.5	0.0	6.9	4.4	0.0	4.9	0.4	3.5	61.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	135.9
35 Jawa Timur	0.0	266.1	0.0	88.3	4.2	60.2	124.3	0.1	171.0	20.2	97.7	36.5	13.0	0.0	0.8	0.5	0.0	0.7	15.9	3.8	0.4	903.7
Jawa	28.1	889.0	16.3	147.8	116.3	252.8	202.3	0.8	265.6	31.4	248.2	137.5	17.1	2.2	1.7	0.7	0.5	2.5	23.7	4.8	0.9	2,390.4
51 Bali	0.0	73.0	0.0	32.0	0.0	32.5	2.2	0.0	0.0	2.2	1.3	14.9	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	163.9
52 Nusatenggara Barat	0.0	62.6	0.0	5.9	0.0	1.6	7.6	0.0	1.2	0.0	5.5	9.7	4.8	0.0	0.0	2.5	0.0	0.1	0.0	0.7	0.0	102.2
53 Nusatenggara Timur	0.0	143.9	0.0	38.3	0.0	5.4	2.7	0.0	0.0	11.6	31.9	30.3	1.6	0.1	0.0	0.7	0.0	0.1	0.0	35.7	21.2	323.4
54 Timor Timur	0.0	48.6	0.0	57.0	0.0	1.2	0.6	0.0	0.1	0.2	9.7	0.3	0.0	0.0	2.5	0.0	0.0	0.0	0.0	17.0	3.9	141.2
Bali & Nusatenggara	0.0	328.1	0.0	133.2	0.0	40.7	13.1	0.1	1.3	14.1	48.4	55.1	6.4	0.1	2.5	3.2	0.0	5.9	0.0	53.5	25.1	730.6
61 Kalimantan Barat	393.3	75.9	68.9	8.6	0.0	9.9	0.0	5.0	0.8	3.2	0.6	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	570.8
62 Kalimantan Tengah	144.2	42.6	0.1	7.6	0.0	4.8	0.0	0.8	0.0	1.4	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	205.8
63 Kalimantan Selatan	108.6	56.5	0.0	8.3	0.0	13.4	0.0	2.2	6.0	0.6	0.6	0.5	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.2	0.9	198.0
64 Kalimantan Timur	15.3	42.1	19.0	8.2	0.0	4.7	0.0	7.6	0.0	13.7	0.1	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	111.3
Kalimantan	661.4	217.1	88.0	32.8	0.0	32.7	0.0	15.5	6.8	18.9	1.3	7.2	0.0	0.2	0.3	0.0	0.0	0.0	2.2	0.6	0.9	1,085.9
71 Sulawesi Utara	0.0	269.3	0.0	4.1	0.0	43.8	0.0	0.0	0.0	1.0	0.0	0.7	0.0	26.9	0.0	0.0	0.0	1.5	0.0	0.0	0.0	347.2
72 Sulawesi Tengah	0.0	160.5	0.0	12.1	0.0	60.4	0.0	0.1	0.0	9.6	1.0	0.3	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	244.7
73 Sulawesi Selatan	3.2	140.6	10.7	46.6	0.1	53.7	5.7	2.6	15.5	22.6	28.3	25.3	8.4	2.1	0.0	0.0	0.0	0.0	0.4	0.0	31.5	397.2
74 Sulawesi Tenggara	0.0	47.9	0.0	0.0	0.0	6.9	0.0	2.3	0.0	30.4	2.7	92.9	2.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	186.7
Sulawesi	3.2	618.2	10.7	62.8	0.1	164.8	5.7	5.0	15.5	63.6	31.9	119.2	11.3	29.7	0.0	0.0	0.0	1.5	0.4	0.0	32.1	1,175.8
81 Maluku	0.0	184.0	0.0	4.8	0.0	49.0	0.0	0.0	0.0	10.6	1.8	3.3	0.0	21.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	275.2
82 Iriyan Jaya	2.4	23.8	9.5	1.0	0.0	4.8	0.0	0.0	0.0	7.3	0.2	0.3	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.9
Maluku & Irian Jaya	2.4	207.8	9.5	5.8	0.0	53.7	0.0	0.0	0.0	17.8	2.0	3.6	0.0	27.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	330.2
INDONESIA	2,589.7	3,221.6	980.7	1,011.5	121.0	762.2	229.1	114.8	355.7	182.0	338.5	327.9	34.8	66.9	77.4	3.9	1.3	10.6	26.2	74.0	71.8	10,601.8

Source:StatistikPerkebunan Indonesia 1989, Directorate of Estate Crops, MOA

Table 2.1 Historical Change in the Harvested Area, Yield and Production of Lowland Paddy (1980-1991)

Province	Harvested area		Yield		Production	
	b ('000ha)	r	b (kg/ha)	r	b ('000 ton)	r
11. D.I. Aceh	6.6	0.912	71.4	0.967	42.4	0.960
12. Sumatera Utara	19.3	0.973	70.2	0.953	108.4	0.991
13. Sumatera Barat	7.0	0.940	93.5	0.987	58.9	0.983
14. Riau	2.1	0.684	74.8	0.913	13.1	0.864
15. Jambi	0.5	0.324	48.0	0.952	8.1	0.924
16. Sumatera Selatan	8.2	0.843	46.2	0.967	39.8	0.931
17. Bengkulu	2.4	0.941	40.3	0.585	10.2	0.913
18. Lampung	10.2	0.969	68.4	0.911	54.0	0.981
Sumatera	56.3	0.994	69.2	0.974	334.9	0.995
31. D.K.I. Jakarta	-1.0	-0.865	173.8	0.970	-1.8	-0.708
32. Jawa Barat	18.3	0.682	126.2	0.975	315.1	0.968
33. Jawa Tengah	16.1	0.774	105.6	0.944	222.4	0.954
34. Yoguyakarta	-0.5	-0.473	95.2	0.947	6.9	0.712
35. Jawa Timur	9.6	0.734	71.6	0.930	151.3	0.931
Jawa	42.5	0.722	103.0	0.959	693.9	0.961
51. Bali	-0.6	-0.472	92.7	0.985	12.4	0.905
52. Nusatenggara Barat	3.5	0.867	92.4	0.949	35.0	0.945
53. Nusatenggara Timur	1.9	0.855	30.9	0.534	7.4	0.816
54. Timor Timur	n.a.	n.a..	n.a.	n.a..	n.a.	n.a.
Bali & Nusatenggara	4.8	0.887	77.1	0.966	54.8	0.957
61. Kalimantan Barat	-0.2	-0.060	28.5	0.705	5.0	0.556
62. Kalimantan Tengah	2.0	0.865	11.0	0.377	5.3	0.842
63. Kalimantan Selatan	5.4	0.930	31.5	0.950	24.2	0.958
64. Kalimantan Timur	0.5	0.426	43.3	0.859	3.1	0.687
Kalimantan	7.8	0.822	28.5	0.952	37.5	0.937
71. Sulawesi Utara	2.5	0.919	69.9	0.795	14.0	0.938
72. Sulawesi Tengah	5.3	0.947	75.1	0.953	22.6	0.974
73. Sulawesi Selatan	19.6	0.868	89.2	0.906	133.4	0.946
74. Sulawesi Tenggara	2.9	0.972	89.5	0.879	11.2	0.981
Sulawesi	30.3	0.939	81.7	0.894	181.2	0.973
81. Maluku	0.4	0.918	46.3	0.892	1.1	0.916
82. Irian Jaya	1.0	0.792	60.8	0.892	2.8	0.794
Maluku & Irian Jaya	1.4	0.856	58.1	0.922	3.9	0.856
Indonesia	143.1	0.935	82.2	0.954	1,306.1	0.980

Remarks: b: average annual increase; r: correlation coefficient; by single correlation method; n.a.: data not available

Source : JICA-FIDP team calculation based on Agricultural Survey Production of Cereals in Indonesia 1980-1991, CBS

Probability	Coefficient
P<0.05	r>0.576
P<0.01	r>0.708
P<0.001	r>0.823

Table 2.2 Historical Change in the Harvested Area, Yield and Production of Upland Paddy (1980-1991)

Province	Harvested area		Yield		Production	
	b ('000ha)	r	b (kg/ha)	r	b ('000 ton)	r
11. D.I. Aceh	-0.6	-0.846	56.2	0.948	-0.6	-0.587
12. Sumatera Utara	-3.8	-0.916	47.2	0.881	-3.2	-0.736
13. Sumatera Barat	0.5	0.681	74.1	0.962	1.7	0.859
14. Riau	-0.5	-0.323	65.0	0.909	1.9	0.588
15. Jambi	2.7	0.927	57.6	0.855	6.0	0.950
16. Sumatera Selatan	-1.3	-0.438	41.2	0.860	1.6	0.279
17. Bengkulu	-0.2	-0.233	31.1	0.800	0.4	0.200
18. Lampung	-2.7	-0.606	88.0	0.936	5.0	0.612
Sumatera	-5.9	-0.635	57.3	0.960	12.9	0.631
31. D.K.I. Jakarta	n.a.	n.a..	n.a.	n.a.	n.a.	n.a.
32. Jawa Barat	4.6	0.746	70.1	0.982	18.8	0.905
33. Jawa Tengah	2.2	0.816	79.3	0.989	9.1	0.932
34. Yoguyakarta	0.3	0.254	88.6	0.957	4.0	0.905
35. Jawa Timur	2.2	0.846	81.2	0.935	10.9	0.936
Jawa	9.3	0.826	77.1	0.978	42.7	0.941
51. Bali	-0.4	-0.904	69.5	0.962	-0.3	-0.829
52. Nusatenggara Barat	-0.4	-0.637	48.4	0.922	0.2	0.272
53. Nusatenggara Timur	-2.1	-0.706	71.5	0.921	1.8	0.393
54. Timor Timur	n.a.	n.a..	n.a.	n.a.	n.a.	n.a.
Bali &Nusatenggara	-2.8	-0.768	67.0	0.947	1.6	0.347
61. Kalimantan Barat	-0.2	-0.090	35.7	0.895	3.7	0.656
62. Kalimantan Tengah	0.6	0.470	31.3	0.966	2.4	0.847
63. Kalimantan Selatan	-0.6	-0.451	65.0	0.965	0.9	0.402
64. Kalimantan Timur	2.4	0.607	36.9	0.950	6.0	0.765
Kalimantan	2.2	0.407	39.2	0.968	13.0	0.874
71. Sulawesi Utara	-0.1	-0.200	19.5	0.559	0.0	-0.011
72. Sulawesi Tengah	-2.5	-0.854	27.4	0.874	-2.8	-0.798
73. Sulawesi Selatan	-1.5	-0.958	67.7	0.946	-1.2	-0.748
74. Sulawesi Tenggara	-1.2	-0.852	32.3	0.796	-1.3	-0.610
Sulawesi	-5.3	-0.973	38.3	0.898	-5.4	-0.885
81. Maluku	-1.7	-0.866	72.4	0.957	-1.3	-0.735
82. Irian Jaya	0.1	0.703	44.4	0.796	0.3	0.736
Maluku & Irian Jaya	-1.5	-0.833	74.0	0.962	-1.0	-0.613
Indonesia	-4.2	-0.381	62.0	0.989	64.0	0.939

Remarks: b: average annual increase; r: correlation coefficient; by single correlation method; n.a.: data not available

Source : JICA-FIDP team calculation based on Agricultural Survey Production of Cereals in Indonesia 1980-1991, CBS

Probability	Coefficient
P<0.05	r>0.576
P<0.01	r>0.708
P<0.001	r>0.823

Table 2.3 Historical Change in the Harvested Area, Yield and Production of Maize (1980-1991)

Province	Harvested area		Yield		Production	
	b ('000ha)	r	b (kg/ha)	r	b ('000 ton)	r
11. D.I. Aceh	1.8	0.875	78.3	0.915	3.5	0.863
12. Sumatera Utara	5.8	0.946	76.2	0.918	16.1	0.966
13. Sumatera Barat	0.7	0.914	89.2	0.969	2.1	0.971
14. Riau	0.3	0.190	73.1	0.932	1.2	0.509
15. Jambi	0.5	0.911	38.9	0.897	0.9	0.922
16. Sumatera Selatan	1.5	0.756	100.9	0.989	3.6	0.878
17. Bengkulu	1.2	0.941	65.4	0.877	2.3	0.964
18. Lampung	17.1	0.944	92.3	0.953	42.6	0.951
Sumatera	28.9	0.967	84.0	0.979	72.1	0.977
31. D.K.I. Jakarta	-	-	-	-	-	-
32. Jawa Barat	5.3	0.710	83.5	0.967	17.8	0.890
33. Jawa Tengah	0.3	0.009	75.1	0.979	42.1	0.541
34. Yogyakarta	-0.3	-0.047	52.3	0.858	2.7	0.262
35. Jawa Timur	-0.2	-0.004	76.4	0.986	83.8	0.782
Jawa	5.2	0.067	75.5	0.988	146.4	0.722
51. Bali	-0.6	-0.417	74.8	0.973	2.9	0.728
52. Nusatenggara Barat	0.0	0.010	52.7	0.914	1.4	0.551
53. Nusatenggara Timur	0.2	0.053	64.9	0.971	14.5	0.928
54. Timor Timur	n.a.	n.a..	n.a.	n.a.	n.a.	n.a.
Bali &Nusatenggara	-0.4	-0.078	65.0	0.982	18.8	0.918
61. Kalimantan Barat	0.4	0.540	27.7	0.427	0.4	0.626
62. Kalimantan Tengah	0.2	0.352	59.1	0.904	0.4	0.626
63. Kalimantan Selatan	0.9	0.894	31.1	0.763	1.3	0.889
64. Kalimantan Timur	0.2	0.297	74.7	0.874	0.6	0.669
Kalimantan	1.7	0.826	44.3	0.853	2.7	0.934
71. Sulawesi Utara	3.9	0.778	50.1	0.836	10.1	0.849
72. Sulawesi Tengah	-2.3	-0.701	67.4	0.866	-1.7	-0.438
73. Sulawesi Selatan	-3.8	-0.345	28.6	0.903	2.2	0.129
74. Sulawesi Tenggara	-1.3	-0.672	57.9	0.958	0.7	0.339
Sulawesi	-3.5	-0.254	39.9	0.965	11.4	0.461
81. Maluku	-0.5	-0.381	44.7	0.799	0.1	0.089
82. Irian Jaya	0.2	0.877	28.3	0.329	0.3	0.772
Maluku & Irian Jaya	-0.2	-0.214	40.8	0.780	0.5	0.342
Indonesia	31.6	0.327	68.8	0.989	251.9	0.841

Remarks: b: average annual increase; r: correlation coefficient; by single correlation method; n.a.: data not available

Source : JICA-FIDP team calculation based on sAgricultural survey Production of Cereals in Indonesia 1980-1991, CBS

Probability	Coefficient
P<0.05	r>0.576
P<0.01	r>0.708
P<0.001	r>0.823

Table 2.4 Historical Change in the Harvested Area, Yield and Production of Cassava (1980-1991)

Province	Harvested area		Yield		Production	
	b ('000ha)	r	b (kg/ha)	r	b ('000 ton)	r
11. D.I. Aceh	0.3	0.757	203.3	0.934	4.7	0.829
12. Sumatera Utara	0.7	0.473	150.0	0.821	12.2	0.626
13. Sumatera Barat	0.5	0.906	104.0	0.759	7.2	0.915
14. Riau	0.2	0.439	293.0	0.746	4.0	0.824
15. Jambi	2.0	0.847	166.4	0.597	21.3	0.881
16. Sumatera Selatan	1.7	0.790	245.1	0.842	25.5	0.839
17. Bengkulu	0.5	0.956	365.0	0.963	6.6	0.973
18. Lampung	6.8	0.735	237.1	0.878	106.0	0.804
Sumatera	12.7	0.825	210.3	0.904	187.5	0.868
31. D.K.I. Jakarta	0.0	-0.936	279.5	0.918	-0.3	-0.939
32. Jawa Barat	-2.5	-0.569	266.7	0.941	15.5	0.403
33. Jawa Tengah	-3.1	-0.643	326.2	0.939	59.5	0.830
34. Yoguyakarta	-0.9	-0.662	290.6	0.854	8.9	0.583
35. Jawa Timur	-12.3	-0.896	316.4	0.974	-22.6	-0.319
Jawa	-18.8	-0.828	309.7	0.969	61.1	0.418
51. Bali	-0.8	-0.706	307.8	0.915	-2.2	-0.257
52. Nusatenggara Barat	0.0	-0.049	175.4	0.781	1.6	0.223
53. Nusatenggara Timur	-1.6	-0.569	249.3	0.896	8.0	0.305
54. Timor Timur	n.a.	n.a..	n.a.	n.a..	n.a.	n.a.
Bali & Nusatenggara	-2.4	-0.654	248.2	0.936	7.4	0.228
61. Kalimantan Barat	0.8	0.511	130.2	0.470	10.2	0.531
62. Kalimantan Tengah	0.0	0.059	111.0	0.478	0.8	0.190
63. Kalimantan Selatan	0.4	0.792	178.0	0.821	5.2	0.840
64. Kalimantan Timur	0.3	0.754	390.7	0.967	5.6	0.929
Kalimantan	1.5	0.717	174.8	0.789	21.8	0.779
71. Sulawesi Utara	-0.2	-0.374	224.4	0.914	0.7	0.176
72. Sulawesi Tengah	0.4	0.465	277.6	0.944	6.8	0.641
73. Sulawesi Selatan	1.8	0.855	204.5	0.897	26.7	0.897
74. Sulawesi Tenggara	-1.0	-0.517	357.6	0.932	-1.0	-0.066
Sulawesi	1.1	0.473	280.6	0.939	33.2	0.866
81. Maluku	0.5	0.127	253.2	0.867	8.7	0.234
82. Irian Jaya	-0.3	-0.431	454.3	0.904	-0.2	-0.043
Maluku & Irian Jaya	0.2	0.055	329.9	0.950	8.4	0.220
Indonesia	-5.6	-0.264	284.2	0.969	319.4	0.802

Remarks: b: average annual increase; r: correlation coefficient; by simple correlation method; n.a.: data not available

Source : JICA-FIDP team calculation based on Agricultural Survey Production of Cereals inIndonesia 1980-1991, CBS

Probability	Coefficient
P<0.05	r>0.576
P<0.01	r>0.708
P<0.001	r>0.823

Table 2.5 Historical Change in the Harvested Area, Yield and Production of Sweet Potato (1980-1991)

Province	Harvested area		Yield		Production	
	b ('000ha)	r	b (kg/ha)	r	b ('000 ton)	r
11. D.I. Aceh	0.1	0.854	72.1	0.589	1.4	0.870
12. Sumatera Utara	-0.3	-0.493	6.3	0.041	-2.4	-0.577
13. Sumatera Barat	0.2	0.864	87.7	0.412	2.0	0.888
14. Riau	0.1	0.621	74.9	0.521	0.7	0.799
15. Jambi	0.2	0.679	132.7	0.703	2.1	0.675
16. Sumatera Selatan	0.1	0.190	19.1	0.151	0.7	0.227
17. Bengkulu	0.4	0.782	258.4	0.888	4.1	0.856
18. Lampung	0.2	0.797	204.8	0.832	2.0	0.848
Sumatera	1.0	0.833	59.7	0.634	10.7	0.846
31. D.K.I. Jakarta	0.0	-0.781	-39.6	-0.417	-0.2	-0.780
32. Jawa Barat	0.2	0.168	223.9	0.963	11.4	0.732
33. Jawa Tengah	-0.6	-0.631	371.1	0.952	4.6	0.659
34. Yoguyakarta	-0.1	-0.747	244.6	0.895	-0.3	-0.448
35. Jawa Timur	-1.7	-0.956	419.3	0.969	-2.2	-0.526
Jawa	-2.2	-0.780	326.5	0.973	13.3	0.668
51. Bali	-0.5	-0.897	220.5	0.983	-2.5	-0.777
52. Nustenggara Barat	-0.1	-0.137	268.6	0.904	0.9	0.194
53. Nusatenggara Timur	-0.6	-0.754	15.9	0.186	-4.6	-0.686
54. Timor Timur	n.a.	n.a..	n.a.	n.a..	n.a.	n.a.
Bali & Nusatenggara	-1.2	-0.871	135.1	0.968	-6.2	-0.731
61. Kalimantan Barat	0.1	0.344	47.0	0.445	0.7	0.378
62. Kalimantan Tengah	0.1	0.471	168.3	0.716	0.9	0.646
63. Kalimantan Selatan	0.1	0.636	198.1	0.526	1.1	0.815
64. Kalimantan Timur	0.1	0.485	231.3	0.810	1.1	0.722
Kalimantan	0.3	0.756	161.7	0.786	3.8	0.901
71. Sulawesi Utara	0.0	-0.133	21.2	0.130	-0.1	-0.036
72. Sulawesi Tengah	0.4	0.329	61.9	0.388	3.2	0.366
73. Sulawesi Selatan	0.0	0.091	21.2	0.130	0.3	0.139
74. Sulawesi Tenggara	-0.2	-0.817	105.2	0.607	-0.8	-0.645
Sulawesi	0.2	0.191	54.0	0.473	2.6	0.367
81. Maluku	-0.4	-0.467	199.9	0.869	-1.7	-0.294
82. Irian Jaya	-3.2	-0.756	188.7	0.591	-20.7	-0.653
Maluku & Irian Jaya	-3.6	-0.801	179.8	0.605	-22.4	-0.688
Indonesia	-5.5	-0.758	203.2	0.983	1.8	0.046

Remarks: b: average annual increase; r: correlation coefficient; by simple correlation method; n.a.: data not available

Source : JICA-FIDPTeam calculation based on Agricultural Survey Production of Cereals in Indonesia 1980-1991, CBS

Probability	Coefficient
P<0.05	r>0.576
P<0.01	r>0.708
P<0.001	r>0.823

Table 2.6 Historical Change in the Harvested Area, Yield and Production of Soya Bean (1980-1991)

Province	Harvested area		Yield		Production	
	b ('000ha)	r	b (kg/ha)	r	b ('000 ton)	r
11. D.I. Aceh	15.2	0.966	21.4	0.761	15.3	0.971
12. Sumatera Utara	3.1	0.928	19.7	0.750	3.2	0.918
13. Sumatera Barat	1.8	0.886	27.1	0.833	1.7	0.868
14. Riau	1.0	0.785	24.1	0.924	0.8	0.786
15. Jambi	0.8	0.842	8.9	0.418	0.7	0.826
16. Sumatera Selatan	1.4	0.886	34.5	0.902	1.7	0.907
17. Bengkulu	0.6	0.770	10.6	0.392	0.6	0.771
18. Lampung	9.3	0.793	25.8	0.714	9.9	0.786
Sumatera	33.3	0.950	22.3	0.855	33.9	0.944
31. D.K.I. Jakarta	n.a.	n.a..	n.a.	n.a..	n.a.	n.a.
32. Jawa Barat	5.8	0.835	56.4	0.985	8.6	0.913
33. Jawa Tengah	4.2	0.519	49.2	0.972	11.6	0.847
34. Yoguyakarta	0.9	0.389	53.3	0.947	3.5	0.860
35. Jawa Timur	5.2	0.481	27.7	0.865	15.7	0.786
Jawa	16.1	0.653	36.2	0.941	39.4	0.881
51. Bali	1.7	0.911	29.4	0.858	2.4	0.934
52. Nusatenggara Barat	7.8	0.956	21.0	0.648	9.3	0.940
53. Nusatenggara Timur.	0.2	0.586	38.9	0.828	0.3	0.739
54. Timor Timur	n.a.	n.a..	n.a.	n.a..	n.a.	n.a.
Bali & Nusatenggara	9.8	0.961	22.9	0.725	11.9	0.950
61. Kalimantan Barat	0.2	0.643	42.2	0.887	0.3	0.776
62. Kalimantan Tengah	0.3	0.717	13.3	0.552	0.3	0.774
63. Kalimantan Selatan	0.4	0.824	37.7	0.910	0.4	0.871
64. Kalimantan Timur	0.2	0.673	38.7	0.903	0.2	0.753
Kalimantan	1.2	0.876	34.6	0.932	1.2	0.915
71. Sulawesi Utara	2.5	0.954	43.4	0.907	3.3	0.959
72. Sulawesi Tengah	0.7	0.737	29.3	0.904	0.7	0.769
73. Sulawesi Selatan	3.8	0.838	41.9	0.959	5.1	0.856
74. Sulawesi Tenggara	0.4	0.462	47.2	0.920	0.5	0.554
Sulawesi	7.4	0.897	41.8	0.970	9.5	0.913
81. Maluku	0.1	0.772	39.9	0.913	0.1	0.809
82. Irian Jaya	0.4	0.670	33.4	0.813	0.5	0.704
Maluku & Irian Jaya	0.5	0.741	34.0	0.843	0.6	0.768
Indonesia	68.2	0.907	28.9	0.944	96.6	0.941

Remarks: b: average annual increase; r: correlation coefficient; by simple correlation method; n.a.: data not available

Source : JICA-FIDP team calculation based on Agricultural Survey Production of Cereals in Indonesia 1980-1991, CBS

Probability	Coefficient
P<0.05	r>0.576
P<0.01	r>0.708
P<0.001	r>0.823

Table 2.7 Historical Change in the Harvested Area, Yield and Production of Groundnuts (1980-1991)

Province	Harvested area		Yield		Production	
	b ('000ha)	r	b (kg/ha)	r	b ('000 ton)	r
11 D.I. Aceh	1.2	0.836	37.2	0.817	1.7	0.921
12 Sumatera Utara	0.9	0.723	-14.5	-0.506	0.7	0.628
13 Sumatera Barat	0.5	0.832	12.6	0.412	0.6	0.808
14 Riau	0.3	0.804	12.6	0.404	0.3	0.823
15 Jambi	0.3	0.826	4.7	0.214	0.3	0.837
16 Sumatera Selatan	0.5	0.549	18.1	0.442	0.7	0.574
17 Bengkulu	0.4	0.857	-0.4	-0.015	0.4	0.833
18 Lampung	0.4	0.551	14.9	0.646	0.5	0.661
Sumatera	4.5	0.918	12.0	0.534	5.2	0.905
31 D.K.I. Jakarta	0.0	-0.907	10.8	0.719	0.0	-0.915
32 Jawa Barat	3.6	0.842	19.5	0.848	5.3	0.880
33 Jawa Tengah	2.0	0.631	1.8	0.218	2.2	0.618
34 Yoguyakarta	0.1	0.102	20.1	0.643	1.0	0.671
35 Jawa Timur	0.2	0.082	10.8	0.632	1.7	0.524
Jawa	5.8	0.685	11.3	0.770	10.1	0.780
51 Bali	0.0	0.017	2.8	0.136	0.0	0.082
52 Nusatenggara Barat	1.2	0.904	7.5	0.282	1.4	0.853
53 Nusatenggara Timur	-0.1	-0.115	-5.9	-0.200	-0.1	-0.155
54 Timor Timur	n.a.	n.a..	n.a.	n.a..	n.a.	n.a.
Bali & Nusatenggara	1.2	0.773	3.8	0.244	1.3	0.689
61 Kalimantan Barat	0.2	0.805	0.1	0.002	0.2	0.673
62 Kalimantan Tengah	0.1	0.870	4.8	0.245	0.1	0.876
63 Kalimantan Selatan	0.9	0.917	-9.0	-0.468	0.8	0.861
64 Kalimantan Timur	0.2	0.673	27.6	0.719	0.2	0.726
Kalimantan	1.4	0.955	-2.7	-0.161	1.3	0.919
71 Sulawesi Utara	0.5	0.667	4.0	0.113	0.5	0.564
72 Sulawesi Tengah	0.5	0.486	6.9	0.222	0.5	0.581
73 Sulawesi Selatan	0.6	0.261	-18.1	-0.591	-0.2	-0.057
74 Sulawesi Tenggara	0.3	0.850	37.8	0.909	0.4	0.897
Sulawesi	1.9	0.523	-11.6	-0.459	1.2	0.289
81 Maluku	0.1	0.356	47.6	0.948	0.2	0.758
82 Irian Jaya	0.1	0.628	32.8	0.782	0.2	0.822
Maluku & Irian Jaya	0.2	0.599	40.0	0.910	0.4	0.863
Indonesia	14.9	0.887	8.4	0.677	19.4	0.890

Remarks: b: average annual increase; r: correlation coefficient; by simple correlation method; n.a.: data not available

Source : JICA-FIDP team calculation based on Agricultural Survey Production of Ce Cereals in Indonesia 1980-1991, CBS

Probability	Coefficient
P<0.05	r>0.576
P<0.01	r>0.708
P<0.001	r>0.823

Table 2.8 Historical Change in the Harvested Area, Yield and Production of Green Grammes (1980-1991)

Province	Harvested area		Yield		Production	
	b ('000ha)	r	b (kg/ha)	r	b ('000 ton)	r
11. D.I. Aceh	0.4	0.865	4.3	0.448	0.4	0.889
12. Sumatera Utara	0.8	0.646	-1.5	-0.098	0.7	0.635
13. Sumatera Barat	0.3	0.897	7.4	0.246	0.3	0.821
14. Riau	0.1	0.347	7.2	0.107	0.1	0.179
15. Jambi	0.3	0.793	1.8	0.076	0.3	0.761
16. Sumatera Selatan	0.1	0.595	24.1	0.918	0.2	0.779
17. Bengkulu	0.2	0.940	23.6	0.944	0.1	0.951
18. Lampung	0.6	0.853	18.9	0.735	0.5	0.876
Sumatera	2.8	0.925	8.3	0.547	2.5	0.907
31. D.K.I. Jakarta	n.a.	n.a..	n.a.	n.a..	n.a.	n.a.
32. Jawa Barat	0.8	0.563	31.4	0.971	1.2	0.775
33. Jawa Tengah	2.1	0.373	25.6	0.914	2.8	0.628
34. Yoguyakarta	-0.1	-0.692	19.1	0.742	0.0	-0.119
35. Jawa Timur	1.9	0.609	32.0	0.981	3.8	0.922
Jawa	4.7	0.571	30.4	0.985	7.8	0.846
51. Bali	0.1	0.244	25.0	0.526	0.2	0.522
52. Nusatenggara Barat	0.7	0.618	13.6	0.874	0.6	0.886
53. Nusatenggara Timur	-0.4	-0.438	14.5	0.351	0.0	0.028
54. Timor Timur	n.a.	n.a..	n.a.	n.a..	n.a.	n.a.
Bali & Nusatenggara	0.4	0.348	12.2	0.560	0.8	0.570
61. Kalimantan Barat	0.0	0.584	5.1	0.435	0.0	0.609
62. Kalimantan Tengah	0.0	-0.300	5.1	0.755	0.0	-0.119
63. Kalimantan Selatan	0.1	0.754	16.2	0.849	0.1	0.825
64. Kalimantan Timur	0.1	0.839	19.0	0.724	0.1	0.877
Kalimantan	0.2	0.840	13.4	0.903	0.2	0.894
71. Sulawesi Utara	0.5	0.891	12.5	0.331	0.5	0.886
72. Sulawesi Tengah	0.2	0.770	12.8	0.659	0.2	0.820
73. Sulawesi Selatan	-0.9	-0.294	28.2	0.901	0.6	0.222
74. Sulawesi Tenggara	0.1	0.712	17.5	0.786	0.1	0.801
Sulawesi	-0.1	-0.029	25.5	0.918	1.4	0.468
81. Maluku	0.0	0.199	42.4	0.794	0.1	0.546
82. Irian Jaya	0.2	0.938	7.2	0.270	0.1	0.948
Maluku & Irian Jaya	0.2	0.634	32.1	0.793	0.3	0.765
Indonesia	8.3	0.710	25.2	0.969	12.9	0.892

Remarks: b: average annual increase; r: correlation coefficient; by simple correlation method; n.a.: data not available

Source : JICA-FIDP team calculation based on Agricultural Survey Production of Cereals in Indonesia 1980-1991, CBS

Probability	Coefficient
P<0.05	r>0.576
P<0.01	r>0.708
P<0.001	r>0.823

Table 2.9 Production of Paddy and Upland Crops by Province 1989

uint: 000 ton

Province	Lowland paddy	Upland paddy	Maize	Cassava	Sweet Potatoes	Soya beans	Ground nuts	Green grammes
11 D.I. Aceh	1,132.7	15.4	23.3	85.2	21.6	118.1	19.3	2.8
12 Sumatera Utara	2,369.8	171.0	198.8	457.6	155.5	25.4	21.3	16.9
13 Sumatera Barat	1,543.6	30.7	28.1	142.0	37.1	11.6	10.3	4.5
14 Riau	307.1	80.8	17.1	111.3	21.0	4.4	3.4	2.1
15 Jambi	439.9	83.7	10.0	255.9	22.8	4.8	3.2	3.0
16 Sumatera Selatan	1,145.8	192.0	43.0	431.2	40.8	14.1	13.9	4.5
17 Bengkulu	235.3	35.0	16.4	63.3	36.0	2.2	4.2	1.7
18 Lampung	1,034.0	249.4	454.3	2,072.8	30.3	99.6	12.8	5.9
Sumatera	8,208.2	858.1	791.0	3,619.3	365.1	280.1	88.3	41.4
31 D.K.I. Jakarta	39.2	0.0	0.0	1.1	0.1	0.0	0.0	0.0
32 Jawa Barat	9,925.2	357.8	265.3	2,203.2	492.7	71.3	105.5	24.1
33 Jawa Tengah	7,662.4	156.3	1,256.6	3,530.2	253.8	199.5	124.3	52.8
34 Yoguyakarta	540.6	96.8	114.9	713.8	12.8	65.4	43.6	0.3
35 Jawa Timur	8,004.3	228.8	2,498.5	3,988.8	251.2	459.3	142.5	68.6
Jawa	26,171.7	839.6	4,135.3	10,437.1	1,010.4	795.4	416.0	145.8
51 Bali	871.4	4.6	104.0	227.8	97.3	25.8	12.0	3.9
52 Nusatenggara Barat	1,078.9	31.7	48.3	172.0	94.0	127.5	21.0	15.2
53 Nusatenggara Timur	204.3	105.3	377.3	973.3	100.5	1.8	7.6	12.8
54 Timor Timur	40.5	n.a.	58.9	32.5	10.1	0.2	1.0	1.4
Bali & Nusatenggara	2,195.0	141.5	588.5	1,405.7	301.9	155.3	41.6	33.3
61 Kalimantan Barat	526.7	162.3	14.4	226.0	20.5	2.8	1.8	0.3
62 Kalimantan Tengah	187.1	80.3	9.1	89.6	20.8	3.3	1.0	0.3
63 Kalimantan Selatan	879.9	44.5	11.8	103.2	25.1	3.2	11.0	1.1
64 Kalimantan Timur	104.0	110.8	7.6	88.4	25.0	3.7	3.4	1.0
Kalimantan	1,697.8	397.9	42.8	507.2	91.4	13.0	17.2	2.7
71 Sulawesi Utara	298.5	16.5	154.9	87.7	28.3	24.4	6.2	5.3
72 Sulawesi Tengah	350.2	34.7	24.6	104.7	74.7	6.3	5.3	2.6
73 Sulawesi Selatan	3,277.1	30.7	371.3	576.3	73.9	26.2	35.6	31.3
74 Sulawesi Tenggara	135.1	19.3	66.7	216.6	25.1	5.2	5.1	1.7
Sulawesi	4,060.9	101.2	617.5	985.4	201.9	62.1	52.3	40.9
81 Maluku	8.8	10.5	13.0	134.8	18.3	1.0	2.0	2.1
82 Irian Jaya	28.9	5.5	4.4	27.8	235.4	8.2	2.2	1.0
Maluku & Irian Jaya	37.8	16.0	17.4	162.6	253.7	9.2	4.2	3.1
Indonesia	42,371.3	2,354.3	6,192.5	17,117.3	2,224.3	1,315.1	619.6	267.1

Source: Agricultural Survey Production of Cereals in Indonesia 1989, CBS

Table 2-10 Production of Paddy and Upland Crops by Province 1990

unit: 000 ton

Province	Lowland paddy	Upland paddy	Maize	Cassava	Sweet Potatoes	Soya beans	Ground nuts	Green grammes
11 D.I. Aceh	1,154.2	15.6	52.1	82.5	25.1	154.0	19.3	5.3
12 Sumatera Utara	2,478.5	139.3	189.5	346.7	138.5	26.8	21.3	6.5
13 Sumatera Barat	1,619.4	26.5	26.7	116.6	33.8	16.6	10.3	2.6
14 Riau	330.9	88.1	23.4	87.3	17.0	5.3	3.4	2.0
15 Jambi	475.2	71.1	10.9	216.1	24.5	6.9	3.2	2.4
16 Sumatera Selatan	1,203.2	200.0	30.3	329.6	36.0	15.9	13.9	3.1
17 Bengkulu	234.1	35.2	25.9	73.0	37.9	8.6	4.2	1.7
18 Lampung	1,110.2	232.7	496.2	1,624.7	35.5	118.3	12.8	6.7
Sumatera	8,605.7	808.5	855.0	2,876.4	348.3	352.5	88.3	30.3
31 D.K.I. Jakarta	39.2	0.0	0.1	0.8	0.1	0.0	0.0	0.0
32 Jawa Barat	10,024.6	390.8	291.2	2,068.0	471.5	96.0	105.5	22.8
33 Jawa Tengah	7,693.2	162.8	1,511.2	3,530.1	242.2	237.3	124.3	58.7
34 Yoguyakarta	533.3	98.9	116.1	710.3	11.7	69.0	43.6	0.3
35 Jawa Timur	8,011.5	223.2	2,578.3	3,710.6	247.4	471.5	142.5	74.3
Jawa	26,301.7	875.7	4,496.9	10,019.8	973.0	873.8	416.0	156.1
51 Bali	848.4	5.2	97.3	287.1	91.5	32.7	12.0	3.9
52 Nusatenggara Barat	1,100.8	29.4	45.3	155.8	87.7	113.1	21.0	13.3
53 N.usatenggara Timur	210.8	119.6	357.0	851.2	91.7	2.8	7.6	13.5
54 Timor Timur	46.1	n.a.	86.1	35.5	7.2	0.2	1.1	2.3
Bali & Nusatenggara	2,206.1	154.3	585.6	1,329.6	278.1	148.7	41.7	33.0
61 Kalimantan Barat	495.5	164.4	14.7	185.9	20.1	3.4	1.8	0.3
62 Kalimantan Tengah	216.6	74.3	9.1	89.8	19.9	3.1	1.0	0.2
63 Kalimantan Selatan	934.7	48.0	17.0	97.1	24.5	3.5	11.0	1.1
64 Kalimantan Timur	108.8	121.3	9.9	90.0	26.0	2.4	3.4	1.1
Kalimantan	1,755.5	408.0	50.7	462.7	90.4	12.4	17.2	2.8
71 Sulawesi Utara	318.3	20.3	165.6	94.1	44.5	35.8	6.2	4.0
72 Sulawesi Tengah	368.8	33.1	25.7	116.8	24.2	4.3	5.3	2.8
73 Sulawesi Selatan	3,109.9	22.5	461.6	456.6	68.9	49.2	35.6	39.8
74 Sulawesi Tenggara	135.7	19.5	67.0	239.6	27.2	7.1	5.1	1.2
Sulawesi	3,932.7	95.4	719.9	907.0	164.7	96.5	52.3	47.7
81 Maluku	8.2	8.9	20.4	196.5	32.1	0.9	2.0	2.0
82 Irian Jaya	15.4	3.0	6.0	37.3	105.0	2.8	2.2	1.2
Maluku & Irian Jaya	23.6	11.9	26.4	233.8	137.1	3.7	4.2	3.2
Indonesia	42,825.3	2,353.7	6,734.4	15,829.3	1,991.7	1,487.6	619.7	273.1

Source: Agricoltural Survey Production of Cereals in Indonesia 1990, CBS

Table 2.11 Production of Paddy and Upland Crops by Province 1991

unit: 000 ton

Province	Lowland paddy	Upland paddy	Maize	Cassava	Sweet Potatoes	Soya beans	Ground nuts	Green grammes
11 D.I. Aceh	1,209.4	12.9	28.2	90.6	32.4	186.2	22.1	5.7
12 Sumatera Utara	2,584.7	145.7	222.2	337.7	132.1	35.9	15.7	7.7
13 Sumatera Barat	1,677.8	30.0	25.3	109.8	36.4	14.5	9.6	2.7
14 Riau	363.6	67.3	25.8	96.1	18.2	12.6	4.5	2.7
15 Jambi	455.2	81.7	8.9	176.5	21.6	7.5	2.6	1.3
16 Sumatera Selatan	1,062.6	166.2	38.9	407.8	43.1	19.0	11.5	4.0
17 Bengkulu	272.6	45.8	26.9	94.3	74.7	9.5	8.7	1.5
18 Lampung	1,088.6	239.0	415.5	1,828.2	43.0	89.0	9.1	4.0
Sumatera	8,714.5	788.5	791.6	3,140.9	401.5	374.2	83.8	29.7
31 D.K.I. Jakarta	27.3	0.0	0.0	0.5	0.1	0.0	0.0	0.0
32 Jawa Barat	9,529.7	363.6	242.3	2,129.0	400.6	121.5	110.5	19.2
33 Jawa Tengah	7,471.1	157.1	1,140.1	3,313.4	247.8	205.2	126.8	28.4
34 Yoguyakarta	540.9	97.0	118.2	680.7	10.1	61.8	39.5	0.2
35 Jawa Timur	7,985.8	220.1	2,504.9	3,718.2	238.6	481.0	151.7	72.6
Jawa	25,554.8	837.8	4,005.5	9,841.8	897.2	869.5	428.5	120.4
51 Bali	818.3	4.1	109.4	260.5	101.4	28.7	14.9	2.4
52 Nusatenggara Barat	1,106.4	28.5	50.9	107.6	41.0	119.2	17.5	14.9
53 Nusatenggara Timur	247.9	118.7	401.6	763.3	109.6	4.3	9.2	12.4
54 Timor Timur	64.6	2.3	91.1	49.1	9.8	0.8	2.8	5.3
Bali & Nusatenggara	2,237.2	153.6	653.0	1,180.5	261.8	153.0	44.4	35.0
61 Kalimantan Barat	490.4	188.4	17.8	264.1	20.8	4.7	1.9	0.4
62 Kalimantan Tengah	211.5	90.0	4.0	53.6	13.4	1.5	1.0	0.2
63 Kalimantan Selatan	963.9	64.1	20.7	114.1	20.5	4.8	15.8	0.7
64 Kalimantan Timur	123.7	122.3	10.4	95.3	22.2	2.5	2.6	1.2
Kalimantan	1,789.5	464.8	52.9	527.1	76.8	13.6	21.3	2.5
71 Sulawesi Utara	347.6	20.4	162.8	126.7	66.3	41.3	9.6	8.0
72 Sulawesi Tengah	426.8	27.6	35.8	123.0	29.2	10.4	6.9	3.0
73 Sulawesi Selatan	3,073.4	31.3	451.3	483.1	57.9	79.9	45.8	34.7
74 Sulawesi Tenggara	146.3	20.8	73.6	264.0	21.7	5.4	4.6	1.0
Sulawesi	3,994.1	100.0	723.4	996.7	175.1	137.0	67.0	46.7
81 Maluku	14.6	9.7	22.3	223.9	61.7	1.2	4.0	1.6
82 Irian jaya	26.2	2.8	7.2	43.5	165.2	7.0	3.2	1.6
Maluku & Irian Jaya	40.8	12.6	29.5	267.4	226.9	8.2	7.2	3.3
Indonesia	42,330.9	2,357.3	6,256.0	15,954.5	2,039.2	1,555.5	652.1	237.4

Source: Agricultural Survey Production of Cereals in Indonesia 1991, CBS

Table 2.12 Production of Vegetables by Province, 1990

unit: 000 ton

Province	SHALLOTS	GARLIC	LEEKS	POTATOES	CABBAGE	MUSTARD GREENS	CARROTS	CHINESE RADISH	KIDNEY BEANS	COW PEAS	CHILI	TOMATOES	EGG PLANT	SNAP BEANS	CUCUMBER	PUMPKIN	SWAMP CABBAGE	SPINACH	Total
11 DI Aceh	3.6	0.3	0.3	3.0	0.9	0.5	0.0	0.2	2.0	3.9	9.2	2.5	0.1	0.2	6.3	0.3	1.7	3.4	38.3
12 Sumatera Utara	21.9	5.3	8.6	87.3	124.6	32.8	16.5	9.4	2.8	26.1	51.5	55.3	23.3	18.1	18.0	3.6	7.4	9.7	522.2
13 Sumatera Barat	10.5	2.4	5.5	12.6	35.4	3.1	0.0	0.1	0.0	2.9	18.5	5.6	2.4	2.7	1.9	0.3	1.1	1.1	106.2
14 Riau	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.3	0.0	2.1	1.9	0.5	2.0	0.1	4.2	1.2	3.2	2.5	18.7
15 Jambi	0.4	0.0	0.2	11.8	2.4	0.4	0.0	0.4	1.2	2.0	3.6	1.0	3.5	1.0	1.1	0.3	0.4	0.5	30.2
16 Sumatera Selatan	0.3	0.0	1.4	0.1	0.9	2.5	0.2	1.0	0.2	3.1	2.7	1.2	2.1	0.1	3.3	0.6	0.9	1.7	22.1
17 Bengkulu	1.7	0.0	3.0	7.8	72.6	46.3	3.8	4.5	4.2	6.4	13.2	28.7	26.5	11.1	56.0	3.5	0.7	1.3	291.4
18 Lampung	0.7	0.0	0.9	3.0	6.8	6.6	0.8	0.1	0.3	3.4	5.2	1.5	1.5	1.1	1.6	0.4	0.7	2.2	36.9
Sumatera	39.0	8.0	19.9	125.6	243.6	93.0	21.4	16.0	10.6	49.9	105.8	96.3	63.4	34.4	92.4	10.3	16.1	22.4	1,068.0
31 DKI Jakarta	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.1	0.0	5.2	0.4	0.3	1.8	0.0	3.3	0.0	16.1	9.2	41.0
32 Jawa Barat	79.8	5.9	142.5	163.6	294.3	129.9	99.4	12.1	38.7	71.5	61.9	67.0	35.6	19.9	96.3	6.2	11.1	12.4	1,348.3
33 Jawa Tengah	172.7	50.6	33.4	243.2	349.1	86.8	27.2	0.4	22.8	20.1	34.1	5.2	9.6	21.7	9.8	3.7	2.8	9.6	1,102.9
34 DI Yogyakarta	8.7	0.4	0.0	0.4	1.7	0.9	0.0	0.0	0.5	0.9	3.9	1.1	0.8	0.3	0.3	0.3	0.3	0.7	21.4
35 Jawa Timur	125.0	22.5	23.0	72.4	100.9	22.9	16.9	0.1	2.1	17.1	53.5	7.1	10.7	9.4	12.5	1.4	6.1	8.6	512.2
Jawa	386.2	79.4	198.9	479.6	746.0	245.3	143.4	12.7	64.2	115.0	153.8	80.7	58.5	51.3	122.2	11.7	36.3	40.6	3,026.0
51 Bali	14.1	8.6	1.9	2.5	45.9	15.0	3.4	1.1	7.4	4.5	5.9	2.7	0.3	18.3	8.1	1.9	2.6	1.4	145.6
52 Nusatenggara Barat	27.8	11.1	0.0	0.0	4.4	0.2	0.0	0.0	0.1	0.8	2.0	1.0	0.5	0.0	2.2	0.1	0.3	0.2	50.6
53 Nusatenggara Timur	2.2	0.6	0.9	2.6	3.1	2.7	0.4	0.0	0.3	0.7	0.5	0.8	0.6	0.3	1.1	2.1	0.4	0.7	20.1
54 Timor Timur	0.2	0.3	0.0	0.2	0.5	0.4	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.9
Bali &Nusatenggara Ti	44.3	20.6	2.7	5.3	53.9	18.2	3.8	1.1	7.9	6.0	8.5	4.6	1.4	18.6	11.4	4.1	3.4	2.4	218.3
61 Kalimantan Barat	0.0	0.0	0.7	0.0	0.0	2.3	0.0	1.0	0.0	5.0	0.8	0.5	1.2	0.3	5.6	0.2	1.4	1.2	20.4
62 Kalimantan Tengah	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	1.7	1.3	0.9	2.0	0.1	4.6	3.4	1.4	0.7	16.5
63 Kalimantan Selatan	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	2.0	1.2	0.5	1.5	0.1	4.2	1.1	0.3	0.9	12.3
64 Kalimantan Tenggara	0.1	0.0	0.3	0.1	0.7	5.2	0.4	0.0	0.0	4.2	3.1	2.0	2.0	1.5	6.6	2.4	2.2	4.8	35.6
Kalimantan	0.1	0.0	1.0	0.1	0.8	8.2	0.4	1.1	0.1	12.9	6.4	3.9	6.8	2.0	21.0	7.0	5.3	7.6	84.8
71 Sulawesi Utara	1.3	0.0	7.5	5.4	6.9	4.2	1.2	0.0	0.9	0.6	4.2	11.1	0.5	0.2	0.3	0.8	0.2	0.2	45.5
72 Sulawesi Tengah	4.0	0.3	0.0	0.8	0.5	0.6	0.0	0.0	0.2	1.9	1.2	1.9	1.5	0.1	2.1	1.7	0.2	0.7	17.8
73 Sulawesi Selatan	18.0	0.3	7.5	10.8	18.0	4.5	1.6	0.0	2.9	5.0	5.9	5.8	4.2	1.2	2.2	0.9	1.6	1.8	92.3
74 Sulawesi Tenggara	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	1.1	0.3	0.8	0.6	0.0	0.6	0.2	0.1	0.4	4.6
Sulawesi	23.4	0.6	15.1	17.0	25.5	9.4	2.8	0.0	4.0	8.6	11.7	19.7	6.8	1.6	5.3	3.6	2.1	3.1	160.3
81 Maluku	0.7	0.0	0.0	0.1	0.7	0.0	0.0	0.0	0.2	0.5	0.7	1.1	1.0	0.3	1.6	0.3	0.7	0.5	8.5
82 Irian Jaya	1.4	0.2	0.2	1.0	1.3	1.7	0.4	0.0	0.2	1.7	0.9	1.1	0.4	0.8	1.3	0.4	0.7	1.3	14.9
Maluku & Irian Jaya	2.1	0.2	0.2	1.1	1.9	1.7	0.4	0.0	0.4	2.2	1.7	2.3	1.4	1.1	2.8	0.8	1.4	1.8	23.4
Indonesia	495.2	108.9	237.8	628.7	1,071.8	375.8	172.2	30.9	87.1	194.7	287.9	207.5	138.4	109.0	255.2	37.5	64.5	77.8	4,580.8

Source: Agricultural Survey Production of Vegetables in Indonesia 1990, CBS

Table 2.13 Production of Fruits by Province 1990

unit: 000 ton

	Province	AVOCADO	MANGO	RAMBOOSTAN	LANGSAT	TANGERINE	ORANGE	GRAPE FRUIT	VALENSIA ORANGE	DURIAN	GUAVA	WATERY ROSE APPLES	MALAY APPLES	ROSE SAPPODILLAS	PAPAYA	BANANA	PINEAPPLES	ZALAKA
1	DI Aceh	0.7	8.3	6.0	3.5	2.7	0.6	1.8	1.6	9.7	1.9	2.6	0.8	3.6	4.1	27.1	0.8	0.0
2	Sumatera Utara	0.9	5.9	3.2	4.2	11.0	1.9	0.4	1.0	28.7	0.9	1.5	0.2	1.7	13.3	60.5	72.2	19.5
3	Sumatera Barat	1.6	1.5	16.0	0.7	2.9	0.0	0.2	0.1	7.2	0.7	0.6	0.0	1.0	2.8	22.1	0.4	0.4
4	Riau	0.1	2.0	6.6	5.5	11.9	0.0	0.1	0.1	8.7	0.5	1.1	0.3	1.8	3.0	52.9	15.6	0.1
5	Jambi	1.0	0.4	7.2	3.4	4.7	1.7	0.3	0.2	5.9	3.6	0.7	0.1	0.1	5.7	10.3	0.9	0.0
6	Sumatera Selatan	1.0	1.0	9.8	10.0	0.8	0.1	0.0	0.0	6.1	1.9	3.1	0.2	2.0	4.3	21.7	33.8	0.1
7	Bengkulu	1.1	1.4	1.5	0.3	0.7	0.1	0.1	0.1	3.1	0.5	0.4	0.1	0.3	1.3	8.4	0.2	0.0
8	Lampung	0.4	1.7	6.8	0.1	0.1	0.0	0.0	0.0	3.6	2.4	2.2	0.1	1.0	4.8	20.5	0.6	0.8
	Sumatera	6.8	22.2	57.1	27.7	34.9	4.5	2.9	3.1	72.9	12.4	12.2	1.7	11.6	39.1	223.4	124.3	20.9
9	DKI Jakarta	0.0	0.7	8.3	0.2	0.0	0.0	0.0	0.0	0.2	2.6	4.3	0.0	0.2	2.3	3.0	0.0	0.3
10	Jawa Barat	40.9	86.6	94.9	10.0	20.7	1.1	2.2	2.5	29.3	85.3	44.3	2.3	16.4	55.4	614.5	174.2	40.5
11	Jawa Tengah	3.1	73.0	36.6	7.3	12.1	1.6	3.1	3.9	19.4	57.4	16.3	1.2	12.7	48.1	476.5	3.3	32.5
12	D.I.Yogyakarta	0.9	5.2	2.7	0.2	1.1	0.4	0.3	0.2	1.4	2.7	1.9	0.0	4.2	11.0	53.7	0.4	8.3
13	Jawa Timur	24.2	202.5	43.8	3.7	29.6	27.7	11.8	7.7	43.9	34.1	24.7	3.7	15.3	106.3	465.4	69.5	24.6
	Java	69.2	367.9	186.2	21.3	63.4	30.8	17.3	14.4	94.1	182.1	91.5	7.2	48.7	223.2	1,613.2	247.4	106.3
14	Bali	1.0	21.4	5.2	1.4	0.1	0.0	0.7	0.3	7.2	4.9	2.7	0.1	2.8	23.1	172.6	0.8	25.5
15	Nusatenggara Barat	0.0	7.3	0.3	0.0	0.1	0.5	0.4	0.1	0.4	5.2	1.6	0.1	0.2	2.4	17.0	0.6	0.0
16	Nusatenggara Timur	2.7	9.1	0.0	0.0	1.7	1.7	4.9	1.4	0.0	2.4	0.1	0.0	0.0	14.8	54.4	1.9	0.0
17	Timor Timur	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Bali and Nusatenggara	3.6	37.8	5.6	1.4	1.8	2.2	5.9	1.8	7.6	12.5	4.3	0.2	3.0	40.3	244.0	3.3	25.6
18	Kalimantan Barat	0.0	0.3	3.8	1.9	41.0	0.0	0.1	0.1	15.2	0.2	0.4	0.1	0.1	0.7	5.7	0.7	0.1
19	Kalimantan Tengah	0.0	0.4	4.5	4.7	0.0	0.6	0.1	0.0	5.7	1.3	0.2	0.0	0.2	0.6	6.4	1.5	0.0
20	Kalimantan Selatan	0.0	1.4	7.5	1.5	0.7	4.5	0.1	0.2	11.7	1.9	0.3	0.1	1.3	1.8	12.9	0.6	0.1
21	Kalimantan Timur	0.2	1.5	3.1	4.6	0.9	3.6	0.6	0.2	13.9	1.3	0.6	0.2	1.1	4.1	10.3	3.3	1.7
	Kalimantan	0.2	3.5	18.9	12.8	42.6	8.8	0.9	0.5	46.6	4.7	1.6	0.4	2.7	7.2	35.3	6.1	1.8
22	Sulawesi Utara	0.8	5.1	0.3	1.6	0.6	0.6	0.5	0.3	2.3	3.2	0.4	0.2	0.0	10.6	14.8	0.7	2.7
23	Sulawesi Tengah	0.0	2.7	0.1	2.3	0.2	0.1	0.5	0.2	1.7	0.8	0.3	0.2	0.0	4.4	27.9	0.3	0.0
24	Sulawesi Selatan	3.7	67.9	2.3	11.4	4.1	0.5	3.3	3.6	9.9	18.1	2.6	7.5	0.0	21.1	213.5	7.3	3.2
25	Sulawesi Tenggara	0.0	1.0	0.0	0.5	0.2	0.4	1.0	0.0	0.3	0.4	0.8	0.0	0.0	1.6	15.8	0.5	0.1
	Sulawesi	4.5	76.7	2.7	15.8	5.1	1.7	5.3	4.2	14.3	22.4	4.2	7.8	0.0	37.9	272.0	8.8	6.0
26	Maluku	0.0	0.0	0.1	0.8	0.4	0.1	0.0	0.0	6.8	0.0	0.0	0.0	0.0	0.7	9.0	0.1	0.0
27	Irian Jaya	0.1	0.7	0.2	0.1	0.3	0.1	0.5	0.2	0.4	1.1	0.2	0.4	0.0	1.1	14.1	0.3	0.2
	Maluku & Irian Jaya	0.2	0.7	0.3	0.9	0.7	0.2	0.5	0.2	7.2	1.1	0.2	0.4	0.0	1.8	23.1	0.4	0.3
	Indonesia	84.6	508.9	270.7	79.9	148.6	48.2	32.8	24.1	242.6	235.2	113.9	17.8	66.0	349.6	2,411.0	390.3	160.8

Source: Agricultural Survey Production of Fruits in Indonesia 1990, CBS

Table 2.14 Production of Estate Crops by Province 1989

unit: 000 ton

Province	RUBBER	COCONUT	OIL PALM	COFFEE	TEA	CLOVE	TOBACCO	PEPPER	SUGAR CANE	CACAO	CAPOK	CASHEW NUT	COTTON PLANT	NUTMEG	CASSIAVERA	CASTOR BEAN	CITRONELLA	VANILLA	ROSELLA	ARECA NUT	CANDLE NUT	TOTAL
11 Aceh	15.7	70.4	92.6	43.8	0.0	6.4	4.7	0.0	11.2	0.1	0.9	0.1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	7.0	6.6	261.6
12 Sumatera Utara	179.5	91.3	1,422.9	43.8	20.0	3.2	2.4	0.0	0.7	15.2	0.0	0.1	0.0	0.1	0.7	0.0	0.0	0.0	0.0	0.2	4.2	1,784.3
13 Sumatera Barat	41.3	69.6	26.9	9.3	0.9	0.8	0.6	0.8	98.5	0.3	0.1	0.0	0.0	0.6	15.0	0.0	0.0	0.0	0.0	0.3	0.0	264.9
14 Riau	100.0	210.5	175.6	6.3	0.0	1.8	0.0	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	494.8
15 Jambi	165.0	95.3	7.6	7.8	6.5	0.1	0.3	0.0	0.3	0.1	0.0	0.0	0.0	0.0	12.3	0.0	0.0	0.0	0.0	0.0	0.0	295.4
16 Sumatera Selatan	185.3	17.5	26.5	79.0	1.1	0.2	0.0	23.5	39.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	373.5
17 Bengkulu	20.3	12.0	1.3	49.9	0.0	1.9	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	86.3
18 Lampung	9.3	105.4	43.1	81.8	0.0	6.4	0.4	26.5	155.4	0.5	0.4	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	429.6
Sumatera	716.5	672.1	1,796.4	321.7	28.5	20.9	8.5	51.1	306.5	16.4	1.6	0.3	0.0	2.7	28.4	0.0	0.0	0.1	0.0	7.5	11.2	3,990.4
31 DKI Jakarta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32 Jawa Barat	9.1	152.1	28.0	5.3	110.2	5.3	1.9	0.3	140.4	2.3	2.5	0.1	0.0	0.0	0.0	0.0	1.2	0.1	0.0	0.3	0.2	459.4
33 Jawa Tengah	0.1	162.4	0.0	10.7	10.9	5.4	35.8	0.0	465.6	0.8	15.2	5.1	4.0	0.1	0.1	0.2	0.0	0.1	4.9	0.0	0.0	721.4
34 D.I.Yogyakarta	0.0	39.8	0.0	0.5	0.0	1.8	2.6	0.0	28.1	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	73.6
35 Jawa Timur	0.0	195.1	0.0	43.5	5.9	7.3	84.3	0.1	1,278.7	8.8	21.6	8.5	12.9	0.0	0.6	0.2	0.0	0.6	19.8	4.9	0.4	1,693.2
Jawa	9.2	549.4	28.0	60.0	127.0	19.8	124.5	0.4	1,912.8	11.9	39.7	14.0	16.9	0.1	0.8	0.4	1.2	0.7	24.9	5.2	0.6	2,947.5
51 Bali	0.0	62.4	0.0	9.3	0.0	3.7	2.8	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	80.0
52 Nusatenggara barat	0.0	39.7	0.0	2.0	0.0	0.1	4.0	0.0	0.9	0.0	0.6	0.1	4.6	0.0	0.0	0.9	0.0	0.0	0.0	0.5	0.0	53.4
53 Nusatenggara Timur	0.0	49.6	0.0	9.8	0.0	0.1	0.6	0.0	0.0	1.1	4.2	0.7	1.4	0.0	0.0	0.1	0.0	0.0	0.0	3.7	3.3	74.7
54 Timor Timur	0.0	9.5	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.6	25.3
Bali & Nusatenggara	0.0	161.2	0.0	31.0	0.0	3.9	7.4	0.0	1.0	1.2	7.4	1.0	6.0	0.0	0.0	1.1	0.0	1.5	0.0	6.9	3.9	233.4
61 Kalimantan Barat	116.7	51.9	110.5	2.6	0.0	2.8	0.0	3.0	1.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	289.3
62 Kalimantan Tengah	57.2	16.6	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	76.4
63 Kalimantan Selatan	38.7	42.7	0.0	1.9	0.0	0.8	0.0	0.7	15.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	100.6
64 Kalimantan Timur	4.0	15.1	3.6	1.9	0.0	0.4	0.0	3.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.7
Kalimantan	216.6	126.3	114.1	7.2	0.0	4.0	0.0	6.6	16.7	2.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.2	0.7	496.0
71 Sulawesi Utara	0.0	254.8	0.0	2.2	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	278.7
72 Sulawesi Tengah	0.0	162.6	0.0	2.3	0.0	8.7	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	174.2
73 Sulawesi Selatan	0.0	108.6	0.5	11.7	0.0	4.9	3.3	0.4	42.1	3.9	5.0	6.3	7.6	0.2	0.0	0.0	0.0	0.0	0.5	0.0	11.9	206.9
74 Sulawesi Tenggara	0.0	33.7	0.0	0.0	0.0	0.7	0.0	0.4	0.0	13.6	0.3	9.3	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	60.8
Sulawesi	0.0	559.6	0.5	16.1	0.0	29.3	3.3	0.8	42.1	17.7	5.7	15.7	10.3	6.8	0.0	0.0	0.0	0.0	0.5	0.0	12.0	720.6
81 Maluku	0.0	188.5	0.0	0.7	0.0	8.3	0.0	0.0	0.0	3.4	0.2	0.1	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	204.2
82 Iriyan Jaya	0.5	10.5	3.0	0.1	0.0	0.3	0.0	0.0	0.0	1.4	0.0	0.1	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.2
Maluku & Irian Jaya	0.5	199.0	3.0	0.8	0.0	8.6	0.0	0.0	0.0	4.7	0.2	0.2	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	221.4
Indonesia	942.8	2,267.6	1,942.0	436.9	155.6	86.5	143.7	58.9	2,279.1	53.9	54.6	31.2	33.2	13.9	29.2	1.4	1.2	2.3	27.0	19.8	28.3	8,609.2

Source: Statistik Perkebunan Indonesia 1989, Directorate General of Estate Crops, MOA

Table 3.1 Area of pady fireld by water regime 1989

unit: 000ha

Province	Technical Irrigation	Semi-technica Irrigation	Simple Irrigation	Irrigated Area	Rainfed	Tidal Swamp	Others	Tidal Swamp and Others	Total
11. D. I. Aceh	3.0	30.1	112.3	145.4	138.9	1.4	37.4	38.8	323.1
12. Sumatera Utara	51.3	62.8	159.0	273.2	209.5	9.2	49.9	59.1	541.8
13. Sumatera Barat	10.1	54.0	92.1	156.1	64.2	0.4	1.9	2.2	222.6
14. Riau	0.0	1.8	21.3	23.1	40.7	44.4	103.8	148.2	212.0
15. Jambi	0.7	10.6	29.6	40.8	31.2	67.2	73.5	140.7	212.8
16. Sumatera Selatan	12.7	6.2	40.3	59.2	48.1	71.1	279.6	350.7	457.9
17. Benkulu	7.5	13.0	23.8	44.3	13.3	0.5	13.4	13.9	71.5
18. Lampung	74.2	17.2	36.9	128.3	61.8	2.2	23.4	25.6	215.7
Sumatera	159.4	195.6	515.3	870.3	607.7	196.4	582.9	779.3	2,257.4
31. D.K.I. Jakarta	1.8	1.1	0.5	3.4	3.0	0.0	0.3	0.3	6.7
32. Jawa Barat	438.4	145.1	319.3	902.7	276.7	0.0	15.1	15.1	1,194.5
33. Jawa Tengah	330.2	133.6	213.5	677.3	329.4	0.0	3.8	3.8	1,010.5
34. D.I. Yogyakarta	0.0	41.2	11.2	52.4	10.2	0.0	0.0	0.0	62.6
35. Jawa Timur	612.6	140.0	146.1	898.6	269.2	0.5	3.0	3.5	1,171.3
Jawa	1,382.9	461.0	690.5	2,534.5	888.4	0.5	22.1	22.6	3,445.6
51. Bali	1.1	65.1	26.7	92.8	0.8	0.0	0.5	0.5	94.1
52. Nusatenggara Barat	37.7	76.3	38.5	152.5	39.3	5.2	0.2	5.4	197.2
53. Nusatenggara Timur	5.8	19.2	38.3	63.3	26.9	0.2	28.2	28.4	118.6
54. Timor Timur	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	44.6	160.5	103.5	308.7	67.0	5.4	28.8	34.2	409.9
61. Kalimantan Barat	0.0	4.1	93.3	97.4	173.2	59.0	101.9	160.9	431.5
62. Kalimantan Tengah	1.9	18.1	26.7	46.7	41.6	60.5	73.5	134.0	222.2
63. Kalalimantan Selatan	7.7	3.8	26.1	37.6	112.9	134.4	182.2	316.6	467.0
64. Kalimantan Timur	0.0	0.4	5.7	6.1	52.5	4.2	98.8	103.0	161.5
Kalimantan	9.6	26.4	151.9	187.8	380.1	258.2	456.2	714.4	1,282.3
71. Sulawesi Utara	17.2	15.4	11.8	44.4	11.1	0.0	11.1	11.1	66.7
72. Sulawesi Tengah	21.1	29.2	45.6	95.8	9.6	0.8	12.0	12.9	118.4
73 Sulawesi Selatan	123.6	41.4	151.1	316.1	256.7	1.0	15.5	16.5	589.3
74. Sulawesi Tenggara	2.4	9.8	17.6	29.8	5.6	0.5	21.2	21.6	57.0
Sulawesi	164.3	95.8	226.1	486.1	283.0	2.3	59.9	62.2	831.3
81. Maluku	na	na	na	na	na	na	na	na	na
82. Irian Jaya	na	na	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na	na	na
Indonesia	1,760.8	939.4	1,687.3	4,387.4	2,226.2	462.8	1,150.0	1,612.7	8,226.4

Source: Agricultural Survey Land Area by Utilization in Jawa 1989, CBS
Agricultural Survey Land Area by Utilization for Outside of Jawa 1989, CBS

Table 3.2 Area of Paddy Field by Water Regime 1990

unit: 000 ha

Province	Technical Irrigation	Semi-technica Irrigation	Simple Irrigation	Irrigated Area	Rainfed	Tidal Swamp	Others	Tidal Swamp and Others	Total
11. D. I. Aceh	6.2	26.9	134.1	167.2	122.0	2.6	34.7	37.3	326.5
12. Sumatera Utara	45.4	69.8	154.7	269.8	196.2	8.3	52.2	60.5	526.6
13. Sumatera Barat	10.1	55.9	93.9	159.9	63.1	0.4	2.2	2.6	225.6
14. Riau	0.0	2.3	20.9	23.3	45.4	46.2	88.4	134.5	203.2
15. Jambi	0.2	11.0	17.0	28.2	29.3	75.2	74.8	150.0	207.5
16. Sumatera Selatan	13.7	6.8	48.9	69.4	46.2	83.9	230.3	314.2	429.9
17. Benkulu	11.2	13.7	21.8	46.7	11.3	3.0	10.9	13.9	71.9
18. Lampung	80.2	23.1	32.0	135.3	58.1	3.9	26.0	29.9	223.3
Sumatera	167.0	209.6	523.4	899.9	571.7	223.5	519.4	742.9	2,214.5
31. D.K.I. Jakarta	1.6	1.1	0.9	3.7	1.7	0.0	0.2	0.2	5.6
32. Jawa Barat	441.5	141.4	319.4	902.3	260.0	0.7	11.3	12.0	1,174.2
33. Jawa Tengah	335.9	130.0	214.6	680.5	323.2	1.1	2.7	3.8	1,007.5
34. D.I. Yogyakarta	0.0	41.1	10.7	51.9	10.4	0.0	0.0	0.0	62.2
35. Jawa Timur	610.1	144.9	142.3	897.3	268.3	1.7	3.6	5.3	1,171.0
Jawa	1,389.1	458.6	688.0	2,535.7	863.5	3.6	17.8	21.4	3,420.5
51. Bali	1.8	66.1	23.5	91.4	1.1	0.0	0.6	0.6	93.1
52. Nusatenggara Barat	35.0	83.3	35.6	153.9	43.5	0.0	0.0	0.0	197.4
53. Nusatenggara Timur	6.5	18.1	38.6	63.2	30.7	0.0	29.1	29.1	122.9
54. Timor Timur	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	43.3	167.4	97.7	308.4	75.3	0.0	29.7	29.7	413.4
61. Kalimantan Barat	3.5	4.3	79.1	86.9	184.8	62.4	108.2	170.6	442.4
62. Kalimantan Tengah	18.2	25.7	41.2	85.2	55.0	55.3	84.2	139.6	279.8
63. Kalalimantan Selatan	7.5	3.9	13.9	25.3	124.4	127.2	186.4	313.7	463.3
64. Kalimantan Timur	0.1	0.6	9.0	9.7	4.6	4.9	103.9	108.8	123.0
Kalimantan	29.4	34.5	143.2	207.1	368.8	249.9	482.8	732.6	1,308.5
71. Sulawesi Utara	19.1	18.4	11.3	48.9	10.5	0.2	9.5	9.7	69.0
72. Sulawesi Tengah	27.6	26.0	44.1	97.7	8.7	0.7	8.8	9.4	115.9
73 Sulawesi Selatan	124.5	41.7	151.7	317.8	240.5	2.8	16.1	18.9	577.2
74. Sulawesi Tenggara	2.9	8.9	20.7	32.5	6.2	0.5	15.7	16.2	54.8
Sulawesi	174.0	95.0	227.9	496.9	265.9	4.1	50.0	54.2	817.0
81. Maluku	na	na	na	na	na	na	na	na	na
82. Irian Jaya	na	na	na	na	na	na	na	na	na
MALUKU & IRIAN JAYA	na	na	na	na	na	na	na	na	na
Indonesia	1,802.9	965.1	1,680.1	4,448.0	2,145.1	481.1	1,099.7	1,580.8	8,173.9

Source: Agricultural Survey Land Area by Utilization in Jawa 1990, CBS
Agricultural Survey Land Area by Utilization for Outside of Jawa 1990, CBS

Table 3.3 Area of paddy field by water regime 1991

unit: 000ha

Province	Technical Irrigation	Semi-technical Irrigation	Simple Irrigation	Irrigated Area	Rainfed	Tidal Swamp	Others	Tidal Swamp and Others	Total
11. D. I. Aceh	0.0	36.8	113.1	149.9	130.1	2.2	34.2	36.4	316.4
12. Sumatera Utara	47.6	69.8	157.0	274.3	204.6	10.6	41.3	51.9	530.8
13. Sumatera Barat	10.1	57.1	99.2	166.4	65.8	0.4	1.6	2.0	234.1
14. Riau	0.0	2.2	24.1	26.3	55.8	39.6	84.1	123.7	205.8
15. Jambi	0.0	9.2	19.0	28.2	27.0	72.9	70.4	143.3	198.5
16. Sumatera Selatan	14.5	8.5	44.6	67.6	53.6	72.8	228.1	300.8	422.1
17. Benkulu	8.4	21.1	20.9	50.3	12.0	3.8	6.5	10.2	72.6
18. Lampung	87.3	23.3	36.5	147.1	57.7	13.7	20.4	34.1	238.9
Sumatera	167.9	228.0	514.2	910.1	606.5	216.1	486.5	702.6	2,219.3
31. D.K.I. Jakarta	1.9	1.0	1.0	3.8	1.4	0.0	0.1	0.1	5.3
32. Jawa Barat	439.9	134.6	318.6	893.2	267.2	0.0	17.1	17.1	1,177.5
33. Jawa Tengah	342.4	135.4	219.9	697.8	308.6	0.1	2.8	2.9	1,009.2
34. D.I. Yogyakarta	6.5	37.3	8.5	52.3	9.5	0.0	0.1	0.1	62.0
35. Jawa Timur	635.0	130.5	133.5	899.0	260.7	0.4	5.3	5.7	1,165.5
Jawa	1,425.8	438.7	681.6	2,546.1	847.5	0.5	25.5	26.0	3,419.5
51. Bali	0.0	66.6	24.3	90.9	0.8	0.0	0.5	0.5	92.2
52. Nusatenggara Barat	39.7	85.6	32.4	157.7	40.0	0.0	0.0	0.0	197.7
53. Nusatenggara Timur	6.1	18.4	34.4	58.9	30.0	0.0	29.5	29.5	118.3
54. Timor Timur	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	45.9	170.6	91.0	307.5	70.8	0.0	30.0	30.0	408.3
61. Kalimantan Barat	1.8	5.4	55.1	62.3	133.2	60.7	134.1	194.7	390.3
62. Kalimantan Tengah	2.9	3.4	36.3	42.7	55.1	84.8	118.0	202.8	300.5
63. Kalalimantan Selatan	7.6	4.1	14.8	26.5	137.1	132.4	177.1	309.5	473.1
64. Kalimantan Timur	0.1	0.4	7.9	8.4	43.8	5.4	81.0	86.4	138.6
Kalimantan	12.5	13.4	114.1	139.9	369.1	283.2	510.1	793.4	1,302.4
71. Sulawesi Utara	20.2	19.2	11.8	51.2	10.2	0.2	5.9	6.1	67.5
72. Sulawesi Tengah	28.5	26.0	59.7	114.2	10.3	0.6	21.9	22.5	147.0
73 Sulawesi Selatan	130.5	41.6	155.9	328.0	245.9	0.8	18.9	19.7	593.6
74. Sulawesi Tenggara	3.8	12.5	18.9	35.2	4.7	0.3	17.1	17.5	57.4
Sulawesi	183.1	99.2	246.3	528.6	271.1	1.8	63.9	65.7	865.5
81. Maluku	na	na	na	na	na	na	na	na	na
82. Irian Jaya	na	na	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na	na	na
Indonesia	1,835.1	950.0	1,647.1	4,432.2	2,165.1	501.7	1,116.0	1,617.7	8,215.0

Source: Agricultural Survey Land Area by Utilization in Jawa 1991, CBS
Agricultural Survey Land Area by Utilization for Outside of Jawa 1991, CBS

Table 3.4 Comparison of CBS and MPW Data on Irrigated Paddy Field 1989

unit: 000ha

Province	Tech.		Semi trech		Non tech		Total	
	PU	CBS	PU	CBS	PU	CBS	PU	CBS
11 D.I. Aceh	4.2	3.0	70.2	30.1	32.8	112.3	107.3	145.4
12 Sumatera Utara	67.1	51.3	81.3	62.8	9.8	159.0	158.2	273.2
13 Sumatera Barat	29.3	10.1	65.4	54.0	63.2	92.1	157.8	156.1
14 Riau	2.1	0.0	6.2	1.8	0.0	21.3	8.3	23.1
15 Jambi	0.8	0.7	12.7	10.6	0.8	29.6	14.3	40.8
16 Sumatera Selatan	26.8	12.7	17.6	6.2	4.1	40.3	48.5	59.2
17 Bengkulu	17.4	7.5	21.4	13.0	7.5	23.8	46.3	44.3
18 Lampung	70.4	74.2	13.3	17.2	2.6	36.9	86.3	128.3
Sumatera	218.0	159.4	288.1	195.6	120.9	515.3	627.0	870.3
31 D.K.I. Jakarta	0.1	1.8	8.3	1.1	0.6	0.5	8.9	3.4
32 Jawa Barat	651.5	438.4	98.5	145.1	80.1	319.3	830.1	902.7
33 Jawa Tengah	506.9	330.2	105.3	133.6	178.6	213.5	790.7	677.3
34 Yoguyakarta	21.3	0.0	30.1	41.2	3.4	11.2	54.9	52.4
35 Jawa Timur	733.3	612.6	108.7	140.0	88.4	146.1	930.4	898.6
Jawa	1,913.1	1,382.9	350.9	461.0	351.1	690.5	2,615.0	2,534.5
51 Bali	26.4	1.1	53.7	65.1	2.5	26.7	82.6	92.8
52 Nusatenggara Barat	42.7	37.7	101.3	76.3	5.6	38.5	149.5	152.5
53 Nusatenggara Timur	6.2	5.8	11.4	19.2	4.8	38.3	22.5	63.3
53 Timor Timur	0.0	n.a.	6.0	n.a.	6.0	n.a.	12.1	n.a.
Bali & Nusatemggar	75.3	44.6	172.5	160.5	18.9	103.5	266.7	308.7
61 Kalimantan Barat	0.2	0.0	7.7	4.1	1.1	93.3	9.0	97.4
62 Kalimantan Tengah	0.0	1.9	0.5	18.1	1.4	26.7	1.9	46.7
63 Kalimantan Selatan	5.9	7.7	3.7	3.8	1.6	26.1	11.2	37.6
64 Kalimantan Timur	0.0	0.0	2.9	0.4	2.8	5.7	5.6	6.1
Kalimantan	6.1	9.6	14.8	26.4	6.9	151.9	27.8	187.8
71 Sulawesi Utara	19.7	17.2	25.5	15.4	3.8	11.8	49.0	44.4
72 Sulawesi Tengah	19.8	21.1	22.1	29.2	9.3	45.6	51.2	95.8
73 Sulawesi Selatan	137.3	123.6	33.3	41.4	40.0	151.1	210.6	316.1
74 Sulawesi Tenggara	8.8	2.4	10.8	9.8	10.8	17.6	30.5	29.8
Sulawesi	185.6	164.3	91.7	95.8	64.0	226.1	341.3	486.1
81 Maluku	0.0	n.a.	0.0	n.a.	9.8	n.a.	9.8	n.a.
82 Irian Jaya	0.0	n.a.	0.6	n.a.	1.6	n.a.	2.1	n.a.
M & IJ	0.0	n.a.	0.6	n.a.	11.4	n.a.	12.0	n.a.
Indonesia	2,398.1	1,760.8	918.5	939.4	573.1	1,687.3	3,889.7	4,387.4

Source: Buku Inventarisasi 1989
Land area by utilization in Jawa 1989 ,CBS
Land area by utilization for outside of Jawa 1989, CBS

Table 3.5 Comparison of the Definition of Terms on the Type of Irrigation between CBS and MPW

CBS	MPW
a) Rice field with technical irrigation Rice field which receive water where the distribution canal is separated from drains to make the storage and distribution can be fully managed and easily measured. This kind of networks usually comprising of primary, secondary and tertiary canal. Primary canal, secondary canal and the related constructed structures are under the authorization and management of the Government.	a) Technical Irrigation networks where the related structures are permanently constructed, supplemented with measuring apparatus and water distribution regulating equipment so that water distribution can be well measured and controlled.
b) Rice field with semi-technical irrigation Rice field with technical irrigation but only spillway structure under the authorization of the Government to control and monitor the water intake, while further networks is not measured and authorized by the Government.	b) Semi-technical Irrigation networks where the related structures are permanently or semi-permanently constructed, supplemented with measuring apparatus or water distribution regulating equipment (either one), so that generally water debit can be controlled but can not be measured or on the other side can be measured but can not be controlled.
c) Rice field with simple irrigation Rice field which receive water where the distribution and drain method has not been managed, although the Government has provided assistance in the construction of the said networks (such as cost for dam construction).	c) Simple irrigation Irrigation networks where the related structures are semi-permanently or not permanently constructed, and supplemented neither with measuring apparatus nor water distribution regulating equipment, and the target only "as long as the water is distributed" to the rice field plots.

Table 3.6 Changes in Area of Lowland by Type of Irrigation and Ecosystem

Unit: 1,000 ha

Province	Technical		Semi Technical		Simple		Sub-total		Rainfed		Tidal swamp		Fresh water swamp		Total	
	1983	1991	1983	1991	1983	1991	1983	1991	1983	1991	1983	1991	1983	1991	1983	1991
11 D.I. Aceh	4.7	0.0	29.8	36.8	112.1	113.1	146.6	149.9	114.9	130.1	3.6	2.2	5.1	34.2	270.2	316.4
12 Sumatera Utara	47.6	47.6	56.6	69.8	182.4	157.0	286.6	274.3	194.5	204.6	8.3	10.6	35.8	41.3	525.2	530.8
13 Sumatera Barat	5.9	10.1	52.0	57.1	98.6	99.2	156.5	166.4	59.3	65.8	0.0	0.4	1.8	1.6	217.6	234.1
14 Riau	0.0	0.0	2.8	2.2	7.1	24.1	9.9	26.3	38.5	55.8	51.7	39.6	52.9	84.1	152.9	205.8
15 Jambi	0.0	0.0	3.1	9.2	29.4	19.0	32.4	28.2	31.1	27.0	78.8	72.9	20.7	70.4	163.2	198.5
16 Sumatera Selatan	10.5	14.5	3.5	8.5	44.7	44.6	58.7	67.6	32.6	53.6	91.0	72.8	240.6	228.1	422.9	422.1
17 Bengkulu	5.3	8.4	11.3	21.1	23.9	20.9	40.6	50.3	10.3	12.0	5.3	3.8	4.5	6.5	60.6	72.6
18 Lampung	60.0	87.3	5.4	23.3	36.4	36.5	101.7	147.1	51.9	57.7	4.6	13.7	8.9	20.4	167.1	238.9
Sumatera	133.9	167.9	164.6	228.0	534.5	514.2	833.0	910.1	533.0	606.5	243.3	216.1	370.3	486.5	1979.7	2219.3
31 D.K.I. Jakarta	2.3	1.9	2.0	1.0	1.3	1.0	5.6	3.8	2.7	1.4	0.0	0.0	0.0	0.1	8.3	5.3
32 Jawa Barat	430.5	439.9	157.0	134.6	297.2	318.6	884.7	893.2	304.6	267.2	0.4	0.0	12.6	17.1	1202.2	1177.5
33 Jawa Tengah	310.4	342.4	127.2	135.4	220.5	219.9	658.1	697.8	324.8	308.6	3.0	0.1	5.9	2.8	991.8	1009.2
34 Yoguyakarta	1.1	6.5	38.3	37.3	11.8	8.5	51.2	52.3	12.1	9.5	0.0	0.0	0.0	0.1	63.3	62.0
35 Jawa Timur	596.9	635.0	149.3	130.5	149.0	133.5	895.3	899.0	267.2	260.7	0.1	0.4	3.9	5.3	1166.5	1165.5
Jawa	1341.2	1,425.8	473.8	438.7	679.9	681.6	2494.8	2546.1	911.4	847.5	3.4	0.5	22.4	25.5	3432.1	3419.5
51 Bali	0.0	0.0	62.2	66.6	35.5	24.3	97.7	90.9	1.1	0.8	0.0	0.0	0.0	0.5	98.8	92.2
52 N.usatenggara Barat.	54.3	39.7	56.7	85.6	33.3	32.4	144.3	157.7	47.3	40.0	0.0	0.0	0.0	0.0	191.6	197.7
53 Nusatenggara Timur	2.0	6.1	12.8	18.4	33.7	34.4	48.5	58.9	25.1	30.0	0.0	0.0	2.7	29.5	76.3	118.3
54 Timor Timur	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bali & Nusatenggara	56.2	45.9	131.7	170.6	102.6	91.0	290.5	307.5	73.5	70.8	0.0	0.0	2.7	30.0	366.7	408.3
61 Kalimantan Barat	0.0	1.8	4.9	5.4	85.1	55.1	90.0	62.3	194.9	133.2	57.4	60.7	33.6	134.1	376.0	390.3
62 Kalimantan Tengah	0.4	2.9	1.5	3.4	31.1	36.3	32.9	42.7	41.5	55.1	36.8	84.8	13.0	118.0	124.2	300.5
63 Kalimantan Selatan	9.5	7.6	2.3	4.1	18.4	14.8	30.2	26.5	116.8	137.1	128.8	132.4	40.5	177.1	316.3	473.1
64 Kalimantan Timur	0.1	0.1	0.1	0.4	4.3	7.9	4.4	8.4	40.6	43.8	10.7	5.4	0.0	81.0	55.8	138.6
Kalimantan	9.9	12.5	8.8	13.4	138.8	114.1	157.5	139.9	393.9	369.1	233.8	283.2	87.1	510.1	872.4	1302.4
71 Sulawesi Utara	5.3	20.2	15.2	19.2	16.9	11.8	37.4	51.2	12.4	10.2	0.0	0.2	4.1	5.9	53.9	67.5
72 Sulawesi Tengah	10.4	28.5	12.9	26.0	67.2	59.7	90.6	114.2	15.8	10.3	0.5	0.6	1.8	21.9	108.7	147.0
73 Sulawesi Selatan	94.7	130.5	42.0	41.6	130.5	155.9	267.2	328.0	282.0	245.9	3.5	0.8	1.1	18.9	553.8	593.6
74 Sulawesi Tenggara	0.0	3.8	4.9	12.5	11.8	18.9	16.6	35.2	11.2	4.7	1.8	0.3	0.1	17.1	29.7	57.4
Sulawesi	110.4	183.1	75.0	99.2	226.4	246.3	411.8	528.6	321.4	271.1	5.7	1.8	7.2	63.9	746.1	865.5
81 Maluku	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
82 Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Maluku & Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Indonesia	1651.7	1,835.1	853.9	950.0	1682.1	1,647.1	4187.7	4432.2	2233.3	2,165.1	486.3	501.8	489.7	1116.0	7396.9	8215.0

Source: Agricultural Suevey Land area by utilization in Jawa 1983 & 1989, CBS

Source: Agricultural Suevey Land area by utilization for Outside of Jawa 1983 & 1989, CBS

Table 3.7 Planted Area and Cropping Intensity of Lowland Field 1989

Province	Field area (000 ha)	CIp					Planted area (000 ha)					Field area		CIp		
		Paddy (1)	Palawija (2)	Estate C. (3)	Pd+PI (1)+(2)	Total (1)+(2)+(3)	Paddy (4)	Palawija (5)	Estate C. (6)	Pd+PI (4)+(5)	Total (4)+(5)+(6)	T-PL/2-E (7)	T-E (8)	PADDY2 (4)/(7)	PADDY3 (4)/(8)	Pd+PI ((4)+(5))/(8)
11 DI Aceh	323.1	0.806	0.050	0.027	0.856	0.883	260.5	16.0	8.7	276.5	285.2	306.4	314.4	0.850	0.828	0.879
12 Sumatera Utara	541.8	1.138	0.084	0.051	1.221	1.272	616.4	45.5	27.4	661.8	689.3	491.7	514.4	1.254	1.198	1.287
13 Sumatera Barat	222.6	1.607	0.025	0.041	1.632	1.674	357.7	5.6	9.2	363.3	372.5	210.6	213.4	1.699	1.676	1.703
14 Riau	212.0	0.467	0.000	0.002	0.467	0.469	99.0	0.0	0.5	99.0	99.4	211.5	211.5	0.468	0.468	0.468
15 Jambi	212.8	0.732	0.002	0.008	0.734	0.742	155.8	0.5	1.7	156.3	157.9	210.9	211.2	0.739	0.738	0.740
16 Sumatera Selatan	457.9	0.776	0.036	0.028	0.812	0.840	355.3	16.3	12.8	371.6	384.4	437.0	445.1	0.813	0.798	0.835
17 Benkulu	71.5	0.953	0.080	0.001	1.032	1.033	68.1	5.7	0.1	73.8	73.9	68.6	71.4	0.993	0.953	1.033
18 Lampung	215.7	1.130	0.072	0.134	1.202	1.337	243.7	15.6	29.0	259.3	288.3	178.9	186.7	1.363	1.306	1.389
Sumatera	2,257.4	0.955	0.047	0.040	1.002	1.041	2,156.5	105.2	89.2	2,261.7	2,350.9	2,115.6	2,168.2	1.019	0.995	1.043
31 DKI. Jakarta	6.7	1.362	0.001	0.000	1.363	1.363	9.1	0.0	0.0	9.1	9.1	6.7	6.7	1.363	1.362	1.363
32 Jawa Barat	1,194.5	1.414	0.202	0.032	1.616	1.648	1,689.1	240.7	38.3	1,929.8	1,968.1	1,035.8	1,156.2	1.631	1.461	1.669
33 Jawa Tengah	1,010.5	1.409	0.412	0.128	1.820	1.948	1,423.6	415.8	129.1	1,839.5	1,968.6	673.5	881.4	2.114	1.615	2.087
34 DI. Yogyakarta	62.6	1.568	1.075	0.138	2.644	2.782	98.1	67.3	8.6	165.4	174.0	20.3	53.9	4.835	1.819	3.067
35 Jawa Timur	1,171.3	1.260	0.562	0.229	1.822	2.050	1,475.8	657.8	268.0	2,133.6	2,401.6	574.4	903.3	2.569	1.634	2.362
Jawa	3,445.6	1.363	0.401	0.129	1.764	1.893	4,695.7	1,381.3	444.1	6,077.0	6,521.1	2,310.8	3,001.4	2.032	1.564	2.025
51 Bali	94.1	1.786	0.397	0.010	2.183	2.192	168.0	37.4	0.9	205.4	206.3	74.5	93.2	2.255	1.803	2.204
52 NTB	197.2	1.165	0.715	0.054	1.880	1.935	229.8	141.1	10.7	370.9	381.6	116.0	186.5	1.981	1.232	1.988
53 NTT	118.6	0.731	0.001	0.024	0.732	0.756	86.6	0.2	2.8	86.8	89.6	115.7	115.7	0.749	0.748	0.750
54Timor Timur	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
B & NT	409.9	1.182	0.440	0.037	1.622	1.658	484.4	180.3	15.0	664.7	679.7	304.7	394.9	1.590	1.227	1.683
61 Kalimantan Barat	431.5	0.367	0.005	0.001	0.372	0.374	158.6	2.2	0.5	160.7	161.2	430.0	431.0	0.369	0.368	0.373
62 Kalimantan Tengah	222.2	0.422	0.019	0.000	0.441	0.441	93.8	4.2	0.0	98.0	98.0	220.1	222.2	0.426	0.422	0.441
63Kalimantan Selatan	467.0	0.672	0.006	0.023	0.677	0.700	313.7	2.7	10.7	316.4	327.2	455.0	456.3	0.690	0.687	0.693
64Kalimantan Timur	161.5	0.265	0.000	0.000	0.265	0.265	42.8	0.0	0.0	42.8	42.8	161.5	161.5	0.265	0.265	0.265
Kalimantan	1,282.3	0.475	0.007	0.009	0.482	0.491	608.9	9.1	11.3	618.0	629.3	1,266.5	1,271.0	0.481	0.479	0.486
71 Sulawesi Utara	66.7	1.159	0.008	0.000	1.166	1.166	77.3	0.5	0.0	77.8	77.8	66.4	66.7	1.163	1.159	1.166
72 Sulawesi Tengah	118.4	1.065	0.240	0.000	1.306	1.306	126.1	28.4	0.0	154.5	154.5	104.1	118.4	1.211	1.065	1.306
73 Sulawesi Selatan	589.3	1.169	0.098	0.036	1.266	1.302	688.6	57.5	20.9	746.2	767.1	539.6	568.4	1.276	1.212	1.313
74 Sulawesi Tenggara	57.0	0.696	0.000	0.011	0.696	0.707	39.6	0.0	0.6	39.6	40.3	56.3	56.3	0.704	0.704	0.704
Sulawesi	831.3	1.121	0.104	0.026	1.225	1.251	931.7	86.5	21.5	1,018.1	1,039.6	766.5	809.7	1.215	1.151	1.257
81 Maluku	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
82 Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
M & IJ	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Indonesia	8,226.4	1.079	0.214	0.071	1.293	1.364	8,877.1	1,762.3	580.8	10,639.4	11,220.2	6,764.5	7,645.6	1.312	1.161	1.392

Source: Calculated by JICA-FIDP Team based on the data provided by DGFCA, Ministry of Agriculture
CIp: Cropping intencity based on planted area

Table 3.8 Planted Area and Cropping Intensity (CIp) of Paddy by Different Ecosystem 1989

unit: 000ha

Province	Whole area			Irrigated area			Rainfed area			Other area		
	Field area	Planted area	CIp	Field area	Planted area	CIp	Field area	Planted area	CIp	Field area	Planted area	CIp
11 D.I. Aceh	323.1	260.5	0.806	145.4	134.5	0.925	138.9	110.7	0.797	38.8	15.3	0.395
12 Sumatera Utara	541.8	616.4	1.138	273.2	447.4	1.638	209.5	152.0	0.726	59.1	17.0	0.287
13 Sumatera Barat	222.6	357.7	1.607	156.1	285.3	1.828	64.2	71.7	1.117	2.2	0.7	0.310
14 Riau	212.0	99.0	0.467	23.1	38.1	1.649	40.6	24.5	0.603	148.2	36.4	0.246
15 Jambi	212.8	155.8	0.732	40.9	70.9	1.733	31.2	25.2	0.808	140.7	59.7	0.424
16 Sumatera Selatan	457.9	355.3	0.776	59.2	98.8	1.669	48.1	46.6	0.969	350.7	209.9	0.599
17 Bengkulu	71.5	68.1	0.953	44.3	57.6	1.300	13.3	6.5	0.489	13.9	4.0	0.288
18 Lampung	215.7	243.7	1.130	128.3	175.5	1.368	61.8	60.3	0.976	25.6	7.9	0.310
Sumatera	2,257.4	2,156.5	0.955	870.5	1,308.1	1.503	607.6	497.5	0.819	779.2	350.9	0.450
31 D.K.I. Jakarta	6.9	9.1	1.326	3.6	7.1	1.979	3.0	1.9	0.627	0.3	0.1	0.369
32 Jawa Barat	1,194.5	1,689.1	1.414	902.7	1,351.3	1.497	276.7	333.7	1.206	15.1	4.1	0.271
33 Jawa Tengah	1,010.5	1,423.6	1.409	677.3	1,005.0	1.484	329.4	415.1	1.260	3.8	3.5	0.936
34 Yoguyakarta	62.6	98.1	1.568	52.4	82.5	1.575	10.2	15.6	1.532	0.0	0.0	0.000
35 Jawa Timur	1,171.3	1,475.8	1.260	898.6	1,219.1	1.357	269.2	255.5	0.949	3.5	1.2	0.343
Jawa	3,445.7	4,695.7	1.363	2,534.7	3,665.0	1.446	888.4	1,021.8	1.150	22.6	8.9	0.394
51 Bali	94.1	168.0	1.786	92.8	166.6	1.795	0.8	0.9	1.150	0.5	0.5	1.000
52 Nusatenggara Barat	197.2	229.8	1.165	152.5	186.7	1.224	39.3	40.9	1.041	5.4	2.2	0.402
53 Nusatenggara Timur	118.6	86.6	0.731	63.3	59.7	0.943	26.9	19.8	0.736	28.4	7.1	0.251
54 Timor Timur	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bali & Nusatenggara	409.9	484.4	1.182	308.6	413.0	1.338	67.0	61.6	0.920	34.3	9.8	0.286
61 Kalimantan Barat	431.5	158.6	0.367	97.4	71.6	0.735	173.1	54.6	0.315	160.9	32.4	0.201
62 Kalimantan Tengah	222.2	93.8	0.422	46.7	25.9	0.555	41.5	20.2	0.487	133.9	47.7	0.356
63 Kalimantan Selatan	467.0	313.7	0.672	37.5	48.9	1.304	112.9	81.1	0.718	316.6	183.7	0.580
64 Kalimantan Timur	161.5	42.8	0.265	6.1	5.8	0.958	52.5	22.3	0.425	102.9	14.6	0.142
Kalimantan	1,282.3	608.9	0.475	187.7	167.2	0.891	380.0	178.2	0.469	714.3	263.5	0.369
71 Sulawesi Utara	66.7	77.3	1.159	44.4	62.1	1.399	11.1	9.6	0.865	11.1	5.6	0.503
72 Sulawesi Tengah	118.4	126.1	1.065	95.8	109.7	1.145	9.6	8.7	0.906	12.9	7.7	0.597
73 Sulawesi Selatan	589.3	688.6	1.169	316.1	423.1	1.339	256.7	257.9	1.005	16.5	7.6	0.463
74 Sulawesi Tenggara	57.0	39.6	0.696	29.8	32.5	1.091	5.6	3.2	0.571	21.7	3.9	0.180
Sulawesi	831.3	931.7	1.121	486.1	627.4	1.291	283.0	279.4	0.987	62.2	24.9	0.400
81 Maluku	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
82 Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Maluku & Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Indonesia	8,226.6	8,877.2	1.079	4,387.6	6,180.7	1.409	2,226.0	2,038.5	0.916	1,612.6	658.0	0.408

Source: JICA-FIDP team calculation by regression method based on Agricultural Survey Land Area by Utilization 1989, and Production of Cereals 1989, CBS

CIp; Cropping intensity based on planted area

Table 3.9 Planted Area and Cropping Intensity of Paddy Field by Different Ecosystem 1990

unit: 000ha

Province	Whole Area			Irrigated Area			Rainfed Area			Other Area		
	Field Area	Planted Area	CIp	Field Area	Planted Area	CIp	Field Area	Planted Area	CIp	Field Area	Planted Area	CIp
11. D. I. Aceh	326.5	294.3	0.901	167.2	162.1	0.969	122.0	117.9	0.967	37.3	14.3	0.383
12. Sumatera Utara	526.6	639.7	1.215	269.8	366.2	1.357	196.2	249.4	1.271	60.5	24.1	0.398
13. Sumatera Barat	225.6	337.0	1.494	159.9	256.7	1.605	63.1	79.0	1.253	2.6	1.3	0.498
14. Riau	203.2	100.3	0.494	23.3	16.9	0.727	45.4	29.2	0.644	134.5	54.1	0.402
15. Jambi	207.5	104.5	0.504	28.2	22.5	0.800	29.3	20.4	0.698	150.0	61.5	0.410
16. Sumatera Selatan	429.9	341.0	0.793	69.4	64.7	0.932	46.2	68.5	1.483	314.2	207.8	0.661
17. Benkulu	71.9	78.2	1.087	46.7	56.0	1.198	11.3	13.6	1.199	13.9	8.6	0.623
18. Lampung	223.3	259.9	1.164	135.3	183.0	1.352	58.1	70.9	1.219	29.9	6.1	0.204
Sumatera	2,214.5	2,154.9	0.973	899.9	1,128.1	1.254	571.7	649.0	1.135	742.9	377.8	0.509
31. D.K.I. Jakarta	5.6	5.9	1.105	3.7	4.2	1.145	1.7	1.6	1.053	0.2	0.1	0.389
32. Jawa Barat	1,174.2	1,804.4	1.532	902.3	1,518.7	1.683	260.0	282.0	1.107	12.0	3.7	0.307
33. Jawa Tengah	1,007.5	1,465.3	1.452	680.5	1,037.5	1.525	323.2	425.7	1.294	3.8	2.1	0.740
34. D.I. Yogyakarta	62.2	90.9	1.467	51.9	80.9	1.559	10.4	10.0	0.426	0.0	0.0	0.000
35. Jawa Timur	1,171.0	1,403.8	1.205	897.3	1,134.2	1.264	268.3	267.9	1.019	5.3	1.8	0.332
Jawa	3,420.5	4,770.3	1.395	2,535.7	3,775.5	1.489	863.5	987.2	1.132	21.4	7.6	0.356
51. Bali	93.1	157.2	1.689	91.4	155.4	1.701	1.1	1.5	1.339	0.6	0.3	0.476
52. Nusatenggara Barat	197.4	223.5	1.132	153.9	187.4	1.218	43.5	36.1	0.828	0.0	0.0	0.000
53. Nusatenggara Timur	122.9	80.1	0.652	63.2	63.3	1.002	30.7	13.1	0.426	29.1	3.8	0.129
54. Timor Timur	na	na	na	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	413.4	460.8	1.115	308.4	406.1	1.317	75.3	50.6	0.672	29.7	4.0	0.136
61. Kalimantan Barat	442.4	178.5	0.404	86.9	75.7	0.871	184.8	59.6	0.323	170.6	43.2	0.253
62. Kalimantan Tengah	279.8	92.1	0.329	85.2	53.3	0.625	55.0	13.9	0.254	139.6	24.9	0.178
63. Kalalimantan Selatan	463.3	272.2	0.588	25.3	21.1	0.832	124.4	107.4	0.864	313.7	143.8	0.458
64. Kalimantan Timur	123.0	44.6	0.362	9.7	4.8	0.490	4.6	2.2	0.478	108.8	37.6	0.346
Kalimantan	1,308.5	587.4	0.449	207.1	154.7	0.747	368.8	183.2	0.497	732.6	249.5	0.341
71. Sulawesi Utara	69.0	72.0	1.043	48.9	62.8	1.284	10.5	7.6	0.725	9.7	1.6	0.166
72. Sulawesi Tengah	115.9	132.7	1.145	97.7	126.3	1.292	8.7	4.4	0.509	9.4	1.9	0.205
73 Sulawesi Selatan	577.2	720.2	1.248	317.8	480.8	1.513	240.5	230.3	0.958	18.9	9.1	0.482
74. Sulawesi Tenggara	54.8	41.1	0.750	32.5	34.9	1.073	6.2	4.0	0.644	16.2	2.3	0.142
Sulawesi	817.0	966.0	1.182	496.9	704.8	1.418	265.9	246.3	0.926	54.2	14.9	0.275
81. Maluku	na	na	na	na	na	na	na	na	na	na	na	na
82. Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Indonesia	8,172.9	8,939.5	1.094	4,448.0	6,169.2	1.387	2,145.1	2,116.3	0.987	1,580.8	653.9	0.414

Source: FIDP team calculation by regression method based on Agricultural Survey Land Area by utilization, 1990 and Production of Cereals, 1990, CBS.
CIp: Cropping intensity based on planted area

Table 3.10 Planted Area and Cropping Intensity of Paddy Field by Different Ecosystem 1991

unit: 000ha

Province	Whole area			Irrigated area			Rainfed area			Other area		
	Field Area	Planted Area	CIp	Field Area	Planted Area	CIp	Field Area	Planted Area	CIp	Field Area	Planted Area	CIp
11. D. I. Aceh	316.4	302.8	0.957	150.0	164.3	1.095	130.1	127.4	0.979	36.4	11.1	0.304
12. Sumatera Utara	530.8	666.9	1.256	274.3	415.2	1.514	204.6	240.5	1.175	51.9	11.2	0.216
13. Sumatera Barat	234.1	349.5	1.493	166.4	271.6	1.633	65.8	77.5	1.179	2.0	0.4	0.202
14. Riau	205.8	109.4	0.532	26.3	23.0	0.875	55.8	43.6	0.781	123.7	42.9	0.346
15. Jambi	198.5	130.1	0.655	28.2	34.4	1.220	27.0	29.8	1.101	143.3	66.0	0.460
16. Sumatera Selatan	422.1	340.8	0.807	67.6	91.9	1.358	53.6	57.8	1.079	300.8	191.1	0.635
17. Benkulu	72.6	67.6	0.932	50.3	62.3	1.239	12.0	3.4	0.282	10.2	1.9	0.186
18. Lampung	238.9	321.9	1.347	147.1	260.1	1.768	57.7	44.5	0.772	34.1	17.3	0.507
Sumatera	2,219.3	2,289.0	1.031	910.1	1322.8	1.454	606.5	624.5	1.030	702.6	341.8	0.486
31. D.K.I. Jakarta	5.3	6.7	1.255	3.8	6.5	1.705	1.4	0.2	0.110	0.1	0.0	0.263
32. Jawa Barat	1,177.5	2,122.1	1.802	893.2	1,697.0	1.900	267.2	412.3	1.543	17.1	12.7	0.741
33. Jawa Tengah	1,009.2	1,515.3	1.502	697.8	1,080.9	1.549	308.6	434.3	1.407	2.9	1.2	0.411
34. D.I. Yogyakarta	62.0	99.9	1.612	52.3	86.4	1.650	9.5	13.5	1.420	0.1	0.0	0.277
35. Jawa Timur	1,165.5	1,624.5	1.394	899.0	1,352.2	1.504	260.7	270.8	1.038	5.7	1.6	0.272
Jawa	3,419.5	5,369.4	1.570	2546.1	4222.9	1.659	847.5	1131.0	1.335	26.0	15.5	0.597
51. Bali	92.2	157.6	1.709	90.9	155.8	1.714	0.8	1.4	1.711	0.5	0.4	0.803
52. Nusatenggara Barat	197.7	280.6	1.419	157.7	248.2	1.574	40.0	32.3	0.807	0.0	0.0	0.000
53. Nusatenggara Timur	118.3	82.2	0.695	58.9	74.8	1.271	30.0	7.2	0.239	29.5	0.3	0.010
54. Timor Timur	na	na	na	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	408.3	520.4	1.275	307.5	478.8	1.557	70.8	40.9	0.577	30.0	0.7	0.024
61. Kalimantan Barat	390.3	200.8	0.514	62.3	52.1	0.837	133.2	111.3	0.835	194.7	37.4	0.192
62. Kalimantan Tengah	300.5	97.0	0.323	42.7	14.9	0.349	55.1	19.1	0.348	202.8	63.0	0.310
63. Kalalimantan Selatan	473.1	379.6	0.802	26.5	30.8	1.161	137.1	154.8	1.129	309.5	194.0	0.627
64. Kalimantan Timur	138.6	45.8	0.331	8.4	11.1	1.318	43.8	16.8	0.383	86.4	17.9	0.208
Kalimantan	1,302.4	723.1	0.555	139.9	108.9	0.778	369.1	302.0	0.818	793.4	312.2	0.394
71. Sulawesi Utara	67.5	74.7	1.107	51.2	62.5	1.220	10.2	12.0	1.179	6.1	0.2	0.036
72. Sulawesi Tengah	147.0	145.1	0.987	114.2	141.3	1.237	10.3	3.5	0.340	22.5	0.4	0.017
73 Sulawesi Selatan	593.6	709.4	1.195	328.0	490.4	1.495	245.9	209.6	0.852	19.7	9.5	0.481
74. Sulawesi Tenggara	57.4	43.6	0.760	35.2	40.4	1.146	4.7	0.4	0.087	17.5	2.9	0.163
Sulawesi	865.5	972.9	1.124	528.6	734.5	1.390	271.1	225.5	0.832	65.7	12.9	0.197
81. Maluku	na	na	na	na	na	na	na	na	na	na	na	na
82. Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Indonesia	8,215.0	9,874.9	1.202	4,432.2	6,867.9	1.550	2,165.1	2,323.9	1.073	1,617.7	683.1	0.422

Source: FIDP team calculation by regression method based on Agricultural Survey Land Area by Utilization 1991 and Production of Cereals 1991, CBS.
CIp: Cropping intensity based on planted area

Table 3.11 Harvested Area and Cropping Intensity (CIh) of Lowland Paddy by Different Ecosystem 1989

unit: 000ha

Province	Whole area			Irrigated area			Rainfed area			Other area		
	Field area	Harvested area	CIh	Field area	Harvested area	CIh	Field area	Harvested area	CIh	Field area	Harvested area	CIh
11 D.I. Aceh	323.1	292.6	0.91	145.4	149.8	1.03	138.9	127.4	0.92	38.8	15.4	0.40
12 Sumatera Utara	541.8	599.5	1.11	273.2	427.7	1.57	209.5	156.5	0.75	59.1	15.3	0.26
13 Sumatera Barat	222.6	341.5	1.53	156.1	275.0	1.76	64.2	65.9	1.03	2.2	0.6	0.25
14 Riau	212.0	96.1	0.45	23.1	38.1	1.65	40.6	23.7	0.58	148.2	34.3	0.23
15 Jambi	212.8	136.2	0.64	40.9	67.0	1.64	31.2	27.2	0.87	140.7	42.0	0.30
16 Sumatera Selatan	457.9	341.8	0.75	59.2	98.8	1.67	48.1	39.6	0.82	350.7	203.4	0.58
17 Bengkulu	71.5	68.1	0.95	44.3	59.6	1.35	13.3	4.6	0.35	13.9	3.9	0.28
18 Lampung	215.7	248.3	1.15	128.3	175.5	1.37	61.8	64.9	1.05	25.6	7.9	0.31
Sumatera	2,257.3	2,124.0	0.94	870.5	1,291.5	1.48	607.6	509.8	0.84	779.2	322.7	0.41
31 D.K.I. Jakarta	6.9	8.4	1.23	3.6	7.3	2.04	3.0	1.0	0.34	0.3	0.1	0.20
32 Jawa Barat	1,194.5	1,973.7	1.65	902.7	1,552.0	1.72	276.7	415.1	1.50	15.1	6.6	0.44
33 Jawa Tengah	1,010.5	1,494.2	1.48	677.3	1,076.8	1.59	329.4	414.2	1.26	3.8	3.2	0.85
34 Yoguyakarta	62.6	101.6	1.62	52.4	87.0	1.66	10.2	14.6	1.43	0.0	0.0	0.00
35 Jawa Timur	1,171.3	1,520.9	1.30	898.6	1,219.0	1.36	269.2	300.8	1.12	3.5	1.1	0.31
Jawa	3,445.7	5,098.8	1.48	2,534.7	3,942.1	1.56	888.4	1,145.7	1.29	22.6	11.0	0.49
51 Bali	94.1	172.6	1.83	92.8	171.0	1.84	0.8	1.2	1.44	0.5	0.4	0.90
52 Nusatenggara Barat	197.2	250.5	1.27	152.5	204.5	1.34	39.3	41.3	1.05	5.4	4.7	0.87
53 Nusatenggara Timur	118.6	67.6	0.57	63.3	54.7	0.86	26.9	9.4	0.35	28.4	3.5	0.12
54 Timor Timur	na	na	na	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	409.9	490.7	1.20	308.6	430.2	1.39	67.0	51.6	0.77	34.3	8.9	0.26
61 Kalimantan Barat	431.5	200.1	0.46	97.4	91.6	0.94	173.1	58.6	0.34	160.9	49.9	0.31
62 Kalimantan Tengah	222.2	87.8	0.40	46.7	21.9	0.47	41.5	18.7	0.45	133.9	47.2	0.35
63 Kalimantan Selatan	467.0	313.0	0.67	37.5	47.9	1.28	112.9	79.0	0.70	316.6	186.1	0.59
64 Kalimantan Timur	161.5	39.3	0.24	6.1	6.1	1.00	52.5	22.1	0.42	102.9	11.1	0.11
Kalimantan	1,282.2	640.2	0.50	187.7	167.4	0.89	380.0	178.4	0.47	714.3	294.4	0.41
71 Sulawesi Utara	66.7	71.7	1.07	44.4	62.1	1.40	11.1	6.2	0.56	11.1	3.4	0.30
72 Sulawesi Tengah	118.4	107.6	0.91	95.8	97.7	1.02	9.6	6.1	0.64	12.9	3.8	0.30
73 Sulawesi Selatan	589.3	771.5	1.31	316.1	498.2	1.58	256.7	264.5	1.03	16.5	8.8	0.53
74 Sulawesi Tenggara	57.0	40.4	0.71	29.8	32.5	1.09	5.6	3.4	0.61	21.7	4.5	0.21
Sulawesi	831.4	991.1	1.19	486.1	690.5	1.42	283.0	280.2	0.99	62.2	20.4	0.33
81 Maluku	na	na	na	na	na	na	na	na	na	na	na	na
82 Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Indonesia	8,226.6	9,344.9	1.14	4,387.6	6,521.7	1.49	2,226.0	2,165.7	0.97	1,612.6	657.5	0.41

Source: JICA-FIDP team calculation by regression method based on Agricultural Survey Land Area by Utilization 1989, and Production of Cereals 1989, CBS
CIh; Cropping intensity based on harvested area

Table 3.12 Harvested Area and Cropping Intensity of Paddy Field by Different Ecosystem 1990

unit: 000 ha

Province	Whole Area			Irrigated Area			Rainfed Area			Other Area		
	Field Area	Harvested Area	CIh	Field Area	Harvested Area	CIh	Field Area	Harvested Area	CIh	Field Area	Harvested Area	CIh
11. D. I. Aceh	326.5	291.6	0.893	167.2	160.6	0.960	122.0	116.9	0.958	37.3	14.1	0.379
12. Sumatera Utara	526.6	618.9	1.175	269.8	354.3	1.313	196.2	241.3	1.229	60.5	23.3	0.385
13. Sumatera Barat	225.6	351.9	1.560	159.9	268.0	1.676	63.1	82.5	1.308	2.6	1.3	0.520
14. Riau	203.2	102.7	0.505	23.3	17.3	0.745	45.4	29.9	0.660	134.5	55.4	0.412
15. Jambi	207.5	145.2	0.700	28.2	31.3	1.111	29.3	28.4	0.969	150.0	85.5	0.570
16. Sumatera Selatan	429.9	353.2	0.822	69.4	67.0	0.965	46.2	71.0	1.536	314.2	215.2	0.685
17. Benkulu	71.9	65.9	0.917	46.7	47.2	1.010	11.3	11.5	1.011	13.9	7.3	0.525
18. Lampung	223.3	264.1	1.182	135.3	185.9	1.374	58.1	72.0	1.238	29.9	6.2	0.207
Sumatera	2,214.5	2,193.4	0.991	899.9	1,131.7	1.258	571.7	653.4	1.143	742.9	408.4	0.550
31. D.K.I. Jakarta	5.6	8.3	1.549	3.7	5.9	1.605	1.7	2.2	1.476	0.2	0.1	0.545
32. Jawa Barat	1,174.2	1,969.2	1.672	902.3	1,657.5	1.837	260.0	307.7	1.208	12.0	4.0	0.335
33. Jawa Tengah	1,007.5	1,485.0	1.471	680.5	1,051.4	1.545	323.2	430.7	1.312	3.8	2.9	0.750
34. D.I. Yogyakarta	62.2	98.3	1.587	51.9	87.9	1.695	10.4	10.4	1.004	0.0	0.0	0.000
35. Jawa Timur	1,171.0	1,502.7	1.289	897.3	1,214.1	1.353	268.3	286.7	1.090	5.3	1.9	0.355
Jawa	3,420.5	5,063.5	1.481	2,535.7	4,016.8	1.585	863.5	1,037.8	1.201	21.4	8.9	0.385
51. Bali	93.1	165.0	1.772	91.4	163.1	1.785	1.1	1.6	1.406	0.6	0.3	0.500
52. Nusatenggara Barat	197.4	251.0	1.271	153.9	210.5	1.368	43.5	40.5	0.930	0.0	0.0	0.000
53. Nusatenggara Timur	122.9	68.0	0.554	63.2	53.7	0.851	30.7	11.1	0.362	29.1	3.2	0.110
54. Timor Timur	na	na	na	na	na	na	na	na	na	na	na	na
Bali &Nusatenggara	413.4	484.1	1.171	308.4	427.4	1.386	75.3	53.2	0.706	29.7	3.5	0.118
61. Kalimantan Barat	442.4	185.3	0.419	86.9	78.5	0.904	184.8	61.9	0.335	170.6	44.9	0.263
62. Kalimantan Tengah	279.8	100.7	0.360	85.2	58.3	0.684	55.0	15.3	0.277	139.6	27.2	0.195
63. Kalalimantan Selatan	463.3	330.9	0.714	25.3	25.6	1.011	124.4	130.5	1.050	313.7	174.7	0.557
64. Kalimantan Timur	123.0	40.3	0.328	9.7	4.3	0.444	4.6	2.0	0.433	108.8	34.0	0.313
Kalimantan	1,308.5	657.3	0.502	207.1	166.7	0.805	368.8	209.7	0.569	732.6	280.8	0.383
71. Sulawesi Utara	69.0	75.2	1.089	48.9	65.6	1.342	10.5	8.0	0.758	9.7	1.7	0.173
72. Sulawesi Tengah	115.9	111.8	0.965	97.7	106.4	1.089	8.7	3.7	0.429	9.4	1.6	0.173
73 Sulawesi Selatan	577.2	725.1	1.256	317.8	484.0	1.523	240.5	231.9	0.964	18.9	9.2	0.485
74. Sulawesi Tenggara	54.8	39.9	0.728	32.5	33.8	1.041	6.2	3.8	0.625	16.2	2.2	0.138
Sulawesi	817.0	952.0	1.165	496.9	689.9	1.388	265.9	247.4	0.931	54.2	14.7	0.271
81. Maluku	na	na	na	na	na	na	na	na	na	na	na	na
82. Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Maluku & Irioan Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Indonesia	8,173.9	9,350.3	1.144	4,448.0	6,432.5	1.447	2,145.1	2,201.4	1.025	1,580.8	716.4	0.453

Source: FIDP team calculation by regression method based on Agricultural Survey Land Area by Utilization, 1990 and Production of Cereals, 1990, CBS.
CIh: Cropping intensity based on harvested area

Table 3.13 Harvested Area and Cropping Intensity of Paddy Field by Different Ecosystem, 1991

unit: 000ha

Province	Whole Area			Irrigated Area			Rainfed Area			Other Area		
	Field Area	Harvested Area	CIh	Field Area	Harvested Area	CIh	Field Area	Harvested Area	CIh	Field Area	Harvested Area	CIh
11. D. I. Aceh	316.4	299.9	0.948	149.9	162.7	1.085	130.1	126.2	0.970	36.4	11.0	0.301
12. Sumatera Utara	530.8	645.9	1.217	274.3	402.2	1.466	204.6	232.9	1.138	51.9	10.9	0.209
13. Sumatera Barat	234.1	361.8	1.545	166.4	281.1	1.690	65.8	80.3	1.220	2.0	0.4	0.209
14. Riau	205.8	112.5	0.547	26.3	23.6	0.900	55.8	44.8	0.803	123.7	44.1	0.356
15. Jambi	198.5	138.3	0.697	28.2	36.6	1.300	27.0	31.6	1.171	143.3	70.1	0.489
16. Sumatera Selatan	422.1	304.8	0.722	67.6	82.2	1.215	53.6	51.7	0.965	300.8	170.9	0.568
17. Benkulu	72.6	75.5	1.040	50.3	69.6	1.383	12.0	3.8	0.314	10.2	2.1	0.208
18. Lampung	238.9	254.0	1.063	147.1	205.2	1.395	57.7	35.1	0.609	34.1	13.6	0.400
Sumatera	2,219.3	2,192.7	0.988	910.1	1,263.3	1.388	606.5	606.4	1.000	702.6	323.0	0.460
31. D.K.I. Jakarta	5.3	5.8	1.084	3.8	5.6	1.473	1.4	0.1	0.095	0.1	0.0	0.227
32. Jawa Barat	1,177.5	1,937.0	1.645	893.2	1,534.8	1.718	267.2	295.6	1.106	17.1	6.6	0.383
33. Jawa Tengah	1,009.2	1,425.6	1.413	697.8	1,014.6	1.454	308.6	408.3	1.323	2.9	2.7	0.950
34. D.I. Yogyakarta	62.0	98.9	1.597	52.3	85.6	1.635	9.5	13.4	1.406	0.1	0.0	0.000
35. Jawa Timur	1,165.5	1,480.8	1.271	899.0	1,232.6	1.371	260.7	246.8	0.947	5.7	1.4	0.248
Jawa	3,419.5	4,948.1	1.447	2,546.1	3,873.1	1.521	847.5	964.2	1.138	26.0	10.8	0.414
51. Bali	92.2	156.3	1.695	90.9	154.5	1.700	0.8	1.4	1.696	0.5	0.4	0.796
52. Nusatenggara Barat	197.7	246.9	1.248	157.7	218.4	1.385	40.0	28.4	0.710	0.0	0.0	0.000
53. Nusatenggara Timur	118.3	79.8	0.674	58.9	72.6	1.233	30.0	6.9	0.231	29.5	0.3	0.010
54. Timor Timur	na	na	na	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	408.3	483.0	1.183	307.5	445.5	1.449	70.8	36.8	0.519	30.0	0.7	0.022
61. Kalimantan Barat	390.3	180.0	0.461	62.3	46.7	0.750	133.2	99.8	0.749	194.7	33.5	0.172
62. Kalimantan Tengah	300.5	89.0	0.296	42.7	13.7	0.320	55.1	17.6	0.319	202.8	57.8	0.285
63. Kalalimantan Selatan	473.1	331.9	0.702	26.5	26.9	1.015	137.1	135.4	0.988	309.5	169.6	0.548
64. Kalimantan Timur	138.6	45.0	0.325	8.4	10.9	1.295	43.8	16.5	0.376	86.4	17.6	0.204
Kalimantan	1,302.4	645.9	0.496	139.9	98.2	0.702	369.1	269.2	0.729	793.4	278.5	0.351
71. Sulawesi Utara	67.5	82.1	1.217	51.2	68.6	1.341	10.2	13.2	1.295	6.1	0.2	0.039
72. Sulawesi Tengah	147.0	129.0	0.878	114.2	125.9	1.102	10.3	3.1	0.302	22.5	0.1	0.004
73 Sulawesi Selatan	593.6	706.1	1.189	328.0	488.0	1.488	245.9	208.6	0.848	19.7	9.4	0.479
74. Sulawesi Tenggara	57.4	42.7	0.744	35.2	39.5	1.122	4.7	0.4	0.085	17.5	2.8	0.160
Sulawesi	865.5	959.9	1.109	528.6	722.0	1.366	271.1	225.3	0.831	65.7	12.5	0.191
81. Maluku	na	na	na	na	na	na	na	na	na	na	na	na
82. Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Indonesia	8,215.0	9,229.6	1.124	4,432.2	6,402.2	1.444	2,165.1	2,101.9	0.971	1,617.7	625.5	0.387

Source: JICA-FIDP team calculation by regression method based on Agricultural Survey Land Area by Utilization 1991, and Production of Cereals 1991, CBS
CIh; Cropping intensity based on harvested area

Table 3.14 Cropping Intensity (CIp) by Cropping Season and Province under Whole Irrigation Scheme 1989

Province	Area (000ha) Designed(D)	Irrigated(I)	I/D	CIp (DS) Paddy	Other crops	Total	CIp (RS) Paddy	Other crops	Total	CIp (annum) Paddy	Other crops	Total
11. D. I. Aceh	214.2	107.3	0.50	0.13	0.04	0.17	0.9	0.02	0.92	1.03	0.06	1.09
12. Sumatera Utara	259.1	158.2	0.61	0.8	0.16	0.96	0.94	0.1	1.04	1.74	0.26	2
13. Sumatera Barat	234.3	158.1	0.67	0.92	0.05	0.97	1.04	0.01	1.05	1.96	0.06	2.02
14. Riau	33.6	8.3	0.25	0.61	0.01	0.62	1.17	0	1.17	1.78	0.01	1.79
15. Jambi	25.5	14.3	0.56	0.75	0	0.75	1.06	0	1.06	1.81	0	1.81
16. Sumatera Selatan	87.4	48.5	0.55	0.81	0	0.81	1.04	0	1.04	1.85	0	1.85
17. Benkulu	81.6	46.3	0.57	0.56	0.07	0.63	0.87	0.01	0.88	1.43	0.08	1.51
18. Lampung	172.2	86.3	0.50	0.54	0.17	0.71	0.98	0.07	1.05	1.52	0.24	1.76
Sumatera	1107.9	627.3	0.57	0.66	0.09	0.75	0.97	0.04	1.01	1.63	0.13	1.76
31. D.K.I. Jakarta	20.5	8.9	0.43	0.5	0.85	1.35	0.9	0.5	1.4	1.4	1.35	2.75
32. Jawa Barat	915.6	830.1	0.91	0.83	0.08	0.91	0.98	0.03	1.01	1.81	0.11	1.92
33. Jawa Tengah	834.2	790.7	0.95	0.55	0.33	0.88	0.81	0.13	0.94	1.36	0.46	1.82
34. D.I. Yogyakarta	61.2	54.9	0.90	0.66	0.18	0.84	0.74	0.16	0.9	1.4	0.34	1.74
35. Jawa Timur	938.7	930.4	0.99	0.48	0.52	1	0.83	0.19	1.02	1.31	0.71	2.02
Jawa	2770.2	2615.0	0.94	0.61	0.32	0.93	0.87	0.12	0.99	1.48	0.44	1.92
51. Bali	89.1	82.6	0.93	0.67	0.44	1.11	1.07	0.1	1.17	1.74	0.54	2.28
52. Nusatenggara Barat	180.0	149.5	0.83	0.43	0.77	1.2	1.06	0.03	1.09	1.49	0.8	2.29
53. Nusatenggara Timur	43.5	22.5	0.52	0.53	0.29	0.82	0.91	0.1	1.01	1.44	0.39	1.83
54. Timor Timur	15.7	12.1	0.77	0.17	0	0.17	0.65	0	0.65	0.82	0	0.82
Bali & Nusatenggara	328.3	266.7	0.81	0.5	0.59	1.09	1.03	0.06	1.09	1.53	0.65	2.18
61. Kalimantan Barat	21.9	9.0	0.41	0.61	0.03	0.64	0.96	0	0.96	1.57	0.03	1.6
62. Kalimantan Tengah	4.5	1.9	0.42	0.02	0.01	0.03	0.5	0.02	0.52	0.52	0.03	0.55
63. Kalalimantan Selatan	33.2	11.2	0.34	0.15	0.02	0.17	1.27	0.01	1.28	1.42	0.03	1.45
64. Kalimantan Timur	32.3	5.6	0.17	0.43	0.01	0.44	1.24	0	1.24	1.67	0.01	1.68
Kalimantan	91.9	27.7	0.30	0.35	0.02	0.37	1.11	0.01	1.12	1.46	0.03	1.49
71. Sulawesi Utara	66.8	49.0	0.73	0.81	0.13	0.94	1	0.04	1.04	1.81	0.17	1.98
72. Sulawesi Tengah	89.3	51.2	0.57	0.71	0.02	0.73	0.92	0.01	0.93	1.63	0.03	1.66
73 Sulawesi Selatan	291.0	210.6	0.72	0.57	0.07	0.64	0.99	0.01	1	1.56	0.08	1.64
74. Sulawesi Tenggara	76.5	30.5	0.40	0.78	0.06	0.84	0.87	0.11	0.98	1.65	0.17	1.82
Sulawesi	523.6	341.3	0.65	0.65	0.07	0.72	0.97	0.02	0.99	1.62	0.09	1.71
81. Maluku	16.0	9.8	0.61	0.23	0.06	0.29	0.52	0.08	0.6	0.75	0.14	0.89
82. Irian Jaya	10.0	2.1	0.21	0.14	0.79	0.93	1.15	0.48	1.63	1.29	1.27	2.56
Maluku & Irian Jaya	26.0	11.9	0.46	0.21	0.19	0.4	0.63	0.15	0.78	0.84	0.34	1.18
Indonesia	4847.9	3889.9	0.80	0.57	0.32	0.89	0.97	0.06	1.03	1.54	0.38	1.92

Remarks: Cropping intensity is calculated as a ratio of planted area to irrigated area
CI (DS): Cropping intensity in dry season; CI (RS): Cropping intensity in rainy season
Source: JICA-FIDP team calculation based on Buku Inventarisasi 1989

Table 3.15 Acreage of leading varieties planted in 1988

unit: 000ha

Province	PB36	Cisadane	IR64	Kr. Aceh	PB42	Semeru	IR46	IR48	Citanduy	Cisokan	Traditional	Others	Total
11. D.I. Aceh	3.4	1.2	1.7	0.2	0.2	1.9	18.5	0.2	0.0	0.0	13.2	22.9	63.5
12. Sumatera Utara	0.7	2.5	84.7	0.2	2.2	2.2	31.7	0.0	0.3	2.3	82.2	43.9	252.9
13. Sumatera Barat	1.6	0.8	22.1	0.8	15.9	7.5	37.3	5.3	0.7	21.2	15.2	34.9	163.5
14. Riau	0.3	0.8	2.1	0.2	3.1	0.1	0.2	0.0	0.4	0.5	18.3	6.6	32.5
15. Jambi	0.1	1.4	0.1	0.0	1.9	0.9	0.2	0.1	0.0	0.0	6.4	4.4	15.5
16. Sumatera Selatan	15.8	0.6	1.2	0.4	7.2	0.9	0.1	0.4	0.3	0.0	42.9	55.1	125.0
17. Bengkulu	0.4	0.9	0.0	0.8	0.1	0.0	0.0	0.2	0.1	0.2	2.3	10.2	15.2
18. Lampung	27.5	17.4	14.9	7.3	0.0	0.0	0.0	0.0	3.9	0.0	2.3	6.0	79.2
Sumatera	49.8	25.6	126.7	10.0	30.6	13.5	87.9	6.4	5.8	24.1	182.7	184.0	747.3
31. D.K.I. Jakarta	0.0	5.8	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2
32. Jawa Barat	4.0	198.1	490.5	6.8	5.2	8.1	0.6	9.3	6.2	0.0	25.1	93.3	847.4
33. Jawa Tengah	92.6	148.0	154.7	4.1	0.1	4.9	0.0	5.4	20.5	0.0	9.6	26.1	466.1
34. Yoguyakarta	5.3	0.9	11.6	0.7	0.0	0.1	0.0	0.9	4.7	0.0	5.9	0.3	30.4
35. Jawa Timur	92.9	25.3	142.9	34.3	0.0	22.8	0.0	1.3	7.2	8.0	3.9	22.6	361.2
Jawa	194.8	378.1	802.1	46.0	5.3	35.9	0.6	16.9	38.6	8.0	44.4	142.3	1,713.2
51. Bali	17.2	2.1	13.0	19.5	0.0	0.2	0.0	0.7	0.0	0.2	5.3	10.9	69.3
52. Nusatenggara Barat	16.2	0.0	0.0	11.8	0.0	4.3	0.0	0.0	0.0	1.8	0.2	4.6	38.9
53. Nusatenggara Timur	na	na	na	na	na	na	na	na	na	na	na	na	na
54. Timor Timur	na	na	na	na	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	33.4	2.2	13.0	31.3	0.0	4.5	0.0	0.7	0.0	2.0	5.5	15.6	108.2
61. Kalimantan Barat	0.1	4.9	0.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	46.4	12.0	64.5
62. Kalimantan Tengah	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	10.3	3.3	14.1
63. Kalimantan Selatan	0.6	0.2	0.0	0.6	0.6	0.0	0.1	0.0	0.0	0.1	12.4	0.6	15.2
64. Kalimantan Timur	4.8	0.3	0.1	0.4	11.9	0.0	1.9	0.0	0.0	2.0	65.0	17.1	103.4
Kalimantan	5.7	5.5	0.1	1.9	12.6	0.0	1.9	0.0	0.0	2.0	134.1	33.1	197.1
71. Sulawesi Utara	12.1	0.0	1.1	0.7	2.0	0.8	0.3	0.3	1.9	0.9	2.6	16.7	39.2
72. Sulawesi Tengah	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	49.4	52.9
73. Sulawesi Selatan	33.8	4.0	53.8	1.7	52.5	4.4	41.6	42.6	0.3	0.0	6.2	97.0	337.9
74. Sulawesi Tenggara	na	na	na	na	na	na	na	na	na	na	na	na	na
Sulawesi	45.9	4.0	54.9	2.4	54.5	5.2	41.8	42.9	2.3	0.9	12.4	163.0	430.1
81. Maluku	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.2	1.0	1.7
82. Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na	na
Ma Maluku & Irian Jaya	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.2	1.0	1.7
Indonesia	329.6	415.3	996.9	91.8	103.1	59.1	132.4	67.0	46.8	37.2	379.4	539.1	3,197.6

Source: Laporan Hasil Inventarasi Penyebaran Varitas Padi Musim Tanam (1988), Directorat Bina Produksi, MOA
Note: Provinces of NTT, Timor Timur, Sulawesi Tenggara and Irian Jaya are not included.

Table 3.16 Acreage of leading varieties planted in 1988/89

unit: 000ha

Province	PB36	Cisadane	IR64	Kr. Aceh	PB42	Semeru	IR46	IR48	Citanduy	Cisokan	Traditional	Others	Total
11. D.I. Aceh	13.8	4.4	10.3	2.2	6.3	1.5	31.9	5.1	1.3	0.8	58.0	85.6	221.2
12. Sumatera Utara	0.0	4.0	26.9	0.1	1.8	2.3	73.9	0.0	0.4	2.2	0.4	25.1	137.2
13. Sumatera Barat	3.8	0.8	23.9	1.4	22.0	6.4	44.3	16.7	0.1	32.9	27.3	36.0	215.7
14. Riau	0.3	2.8	1.6	0.4	7.1	0.2	1.2	0.0	0.4	0.6	52.6	6.3	73.4
15. Jambi	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	12.4	6.0	20.4
16. Sumatera Selatan	22.5	5.0	11.0	4.1	2.6	0.9	0.0	6.2	0.0	0.0	16.6	21.2	90.1
17. Bengkulu	1.1	3.3	0.1	1.1	0.0	0.2	0.0	1.0	0.4	0.0	7.9	20.2	35.2
18. Lampung	35.1	37.7	35.8	14.9	2.7	0.1	4.3	2.5	7.2	0.0	114.7	31.0	286.0
Sumatera	76.6	58.0	109.6	24.1	42.6	13.5	155.8	31.5	9.8	36.4	289.9	231.4	1,079.2
31. D.K.I. Jakarta	0.0	5.8	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2
32. Jawa Barat	5.1	447.8	443.8	5.8	6.4	8.9	0.0	3.2	8.0	0.1	139.7	122.6	1,191.3
33. Jawa Tengah	220.9	235.8	253.5	12.0	0.3	41.4	0.8	2.7	7.0	0.0	31.1	30.2	835.7
34. Yoguyakarta	25.5	14.7	20.1	2.3	0.0	0.0	0.0	0.3	3.2	0.0	20.0	9.4	95.5
35. Jawa Timur	310.0	89.2	247.3	167.6	0.0	115.9	0.0	2.4	21.3	12.1	19.6	132.6	1,118.1
Jawa	561.5	793.4	967.1	187.6	6.6	166.3	0.8	8.6	39.4	12.2	210.5	294.8	3,248.8
51. Bali	19.5	2.5	13.6	42.9	0.0	0.0	0.0	0.7	0.0	0.1	6.2	12.4	98.0
52. Nusatenggara Barat	63.0	0.1	0.1	34.9	0.0	14.1	0.0	0.2	0.0	2.3	1.5	9.3	125.4
53. Nusatenggara Timur	na	na	na	na	na	na	na	na	na	na	na	na	na
54. Timor Timur	na	na	na	na	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	82.5	2.5	13.7	77.8	0.0	14.1	0.0	0.9	0.0	2.4	7.7	21.7	223.4
61. Kalimantan Barat	2.6	16.0	6.4	7.3	0.0	0.0	0.0	0.0	0.0	0.4	100.2	51.9	184.9
62. Kalimantan Tengah	2.8	2.3	0.0	1.3	1.6	0.0	0.0	0.0	0.0	0.0	55.1	6.7	69.7
63. Kalimantan Selatan	0.2	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.1	2.0	0.6	3.2
64. Kalimantan Timur	11.9	0.7	0.2	0.4	41.3	0.1	3.2	0.0	0.0	6.9	48.9	36.9	150.5
Kalimantan	17.5	19.0	6.6	9.1	42.9	0.1	3.4	0.0	0.0	7.4	206.3	96.0	408.3
71. Sulawesi Utara	19.5	0.0	1.5	1.3	2.3	1.4	0.3	0.5	3.6	2.1	3.7	24.1	60.1
72. Sulawesi Tengah	na	na	na	na	na	na	na	na	na	na	na	na	na
73. Sulawesi Selatan	18.3	50.2	34.7	1.5	156.2	2.2	23.0	38.6	0.0	0.0	33.3	71.8	429.7
74. Sulawesi Tenggara	na	na	na	na	na	na	na	na	na	na	na	na	na
Sulawesi	37.9	50.2	36.2	2.7	158.5	3.6	23.3	39.1	3.6	2.1	36.9	95.8	489.8
81. Maluku	0.0	0.0	0.3	0.1	0.0	0.0	0.2	0.0	0.0	0.3	0.5	1.5	3.0
82. Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na	na
Maluku & Irian Jaya	0.0	0.0	0.3	0.1	0.0	0.0	0.2	0.0	0.0	0.3	0.5	1.5	3.0
Indonesia	775.9	923.1	1,133.6	301.4	250.7	197.6	183.4	80.1	52.8	60.8	751.9	741.3	5,452.4

Source: Laporan Hasil Inventarasi Penyebaran Varitas Padi Musim Tanam (1988/89), Directorat Bina Produksi, MOA
Note: Provinces of NTT, Timor Timur, Sulawesi Tenggara and Irian Jaya are not included.

Table 3.17 Agronomic Traits of Major Paddy Varieties

Variety	Origir	Released/ Introduced	Maturity (days)	Yield (ton/ha)	Taste	Resistant
PB 36	P	1977	115	5-8	K	Wck1, Wck2, T,WH,BB,BP,KR
Cisadane	I	1980	140	5-8	E	Wck1, Wck2, WH,BB,KR
IR 64	P	1986	115	5-8	E	Wck1, Wck2, WH,BB,KR
Krueng Aceh	I	1981	130	5-8	E	Wck1, Wck2, BB
PB 42	P	1980	135	5-8	K	Wck1, Wck2, BB,KR,BT
Semuru	I	1980	120	4-7	K	Wck1, Wck2, BB,KR
IR 46	P	1983	130	5-8	K	Wck1, Wck2, Wck SU,KR,WH,BB
IR 48	P	1986	135	5-8	K	Wck1, Wck2, BB,B,T
Citandung	I	1983	120	5-8	S	Wck1, Wck2, BB
Sadang	I	1983	125	5-8	E	Wck1, Wck2, WPP,BB,T
Cisokan	I	1985	115	5-8	K	Wck1, Wck2, BB
PB 54	P	1981	125	5-8	K	Wck1, Wck2, T
Borita*	I	1981	140	5-7	S	Wck1, BB
Kelara	I	1983	105	5-8	K	Wck1, Wck2, Wck SU,BB
Cikapung	I	1984	115	5-8	E	Wck1, Wck2, BB
Bahbolon	I	1983	125	5-8	K	Wck1, Wck2, Wck SU,WPP

Note
P: Philippines
I: Indonesia
B: Blast
BB: Bacterial leaf blight
BD: Bacterial leaf streak
E: Good taste
K: Poor taste
KH: Rice ragit stunt virus desease
KR: Rice grassy stunt virus desease
S: Moderate
T: Rice tungro virus desease
Wck 1: Brown plant hopper biotype 1
Wck 2: Brown plant hopper biotype 2
Wck SU: Brown plant hopper biotype North Sumatra
WH: Green leaf hopper
WPP: White backed plant hopper
*: For tidal swamp

Source : High-yielding Varieties of Food Crops, CRIFC, 1991

Table 3.18 Area and Intensity of Damage by Pest and Deseases with Lowland Paddy in Several Provinces (1987)

Pest / deseases		Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Stem borer	Area (ha)	10,411	8,918	8,166	4,838	4,386	8,038	4,723	2,935	3,521	2,166	3,209	3,776	65,087
	Intensity (%)	8.2	11.4	11.5	14.2	9.8	8.6	10.4	11.2	16.7	12.2	27.7	12.8	11.7
BPH	Area (ha)	4,931	4,927	1,853	429	442	500	496	837	1,097	430	735	561	17,238
	Intensity (%)	16.2	14.8	13.8	14.5	11.1	19.6	18.0	13.8	13.0	19.9	13.8	15.5	15.2
Gall midge	Area (ha)	5,585	3,919	2,118	916	574	912	772	896	749	522	155	891	18,009
	Intensity (%)	10.4	11.8	14.5	15.3	10.6	13.5	11.4	18.4	13.3	11.9	11.0	8.6	12.1
Rat	Area (ha)	13,399	10,521	6,319	5,343	7,681	13,275	9,642	6,598	3,410	2,133	2,564	5,567	86,452
	Intensity (%)	12.8	12.9	14.9	19.7	11.8	14.4	19.1	24.2	28.9	18.6	17.6	12.7	16.0
Army worm	Area (ha)	518	938	3,697	1,391	330	154	1,382	581	432	399	331	346	10,499
	Intensity (%)	13.5	13.6	15.3	14.0	15.5	11.6	33.8	19.8	8.2	19.9	13.2	20.6	17.5
Leaf folder	Area (ha)	10,092	10,515	6,453	3,915	4,841	4,211	5,161	2,578	1,583	1,347	2,310	4,738	57,744
	Intensity (%)	12.6	14.4	18.3	14.7	10.7	9.0	10.7	14.2	12.1	12.1	10.7	13.5	13.1
Rice bug	Area (ha)	1,394	2,612	3,426	4,090	2,294	2,174	1,202	1,054	1,244	696	250	365	20,801
	Intensity (%)	11.7	6.9	10.4	13.4	9.5	11.6	8.9	7.9	6.9	7.3	10.4	8.0	10.1
Scotinophora	Area (ha)	322	239	194	134	150	378	187	113	653	294	380	396	3,440
	Intensity (%)	10.5	9.8	12.6	4.1	11.1	6.6	8.0	6.7	10.3	9.6	6.1	12.6	9.2
Wild pig	Area (ha)	457	387	269	62	143	155	185	100	861	143	55	355	3,172
	Intensity (%)	9.7	22.9	25.3	19.7	7.4	15.0	25.0	25.0	9.7	17.3	22.7	9.1	14.9
Bird	Area (ha)	62	168	220	213	62	58	66	17	40	15	6	12	939
	Intensity (%)	9.9	14.6	12.8	24.9	18.5	17.5	14.1	21.3	27.6	14.1	29.3	6.3	17.2
Blast	Area (ha)	787	649	229	114	90	72	104	43	331	69	57	18	2,563
	Intensity (%)	20.4	17.8	10.7	18.7	12.3	24.2	11.2	14.2	10.9	14.0	20.0	7.9	16.6
Sheath rot	Area (ha)	892	387	434	43	30	70	501	271	42	8	45	71	2,794
	Intensity (%)	9.6	13.9	16.4	7.9	6.0	8.0	12.3	13.0	16.8	22.1	12.0	11.8	12.2
B.L.spot	Area (ha)	1,124	447	212	42	157	145	165	227	104	114	68	122	2,927
	Intensity (%)	16.1	13.8	9.7	15.9	9.6	14.3	154.4	14.0	16.0	8.5	8.5	16.5	14.2
BLB	Area (ha)	1,201	1,127	1,643	55	42	200	701	441	140	17	56	107	5,730
	Intensity (%)	23.4	18.0	24.7	17.2	8.2	16.9	21.0	23.1	17.6	48.4	8.7	8.8	21.5
RTV	Area (ha)	690	1,085	969	514	761	183	145	119	14	17	72	192	4,761
	Intensity (%)	22.5	14.7	20.1	22.0	17.4	21.6	16.8	15.9	15.7	21.9	17.0	11.5	18.4
Yellow dwarf	Area (ha)	319	144	582	144	49	26	144	22	15	14	16	874	2,349
	Intensity (%)	28.2	48.8	40.1	30.8	15.0	10.0	11.8	10.0	30.1	4.3	6.0	28.7	30.8
RGSV	Area (ha)	260	188	160	42	15	40	2	0	18	27	2	2	756
	Intensity (%)	25.5	27.0	21.1	13.3	9.0	7.6	10.0	0.0	5.0	15.0	15.0	1.0	22.0
Orange leaf	Area (ha)	20	4	0	0	0	40	4	0	0	0	0	13	81
	Intensity (%)	12.7	11.0	0.0	0.0	0.0	33.0	20.0	0.0	0.0	0.0	0.0	6.0	21.9
Empty grain	Area (ha)	162	544	139	46	36	197	44	38	162	47	11	14	1,440
	Intensity (%)	27.6	13.2	17.0	16.9	13.7	14.9	13.7	6.4	12.5	20.1	11.1	9.2	15.5
Others	Area (ha)	801	1,032	597	679	482	486	166	552	77	99	180	450	5,601
	Intensity (%)	29.9	25.9	45.9	77.1	29.9	21.3	21.7	5.5	15.2	11.5	13.6	10.6	15.9
Total	Area (ha)	53,065	48,355	36,973	22,524	21,859	30,793	25,546	17,231	14,377	8,552	10,330	18,617	308,222
	Intensity (%)	12.9	13.6	16.1	18.1	11.9	12.3	15.8	17.6	17.0	14.2	17.8	13.5	14.5

Remarks: Damaged area and intensity are recorded in 20 provinces only.

Source: Area and Intensity of Pest, Insects and Calamity of Paddy and Secondary Crops in Indonesia 1987, CBS

Table 3.19 Area and Intensity of Damage by Pest and Deseases with Lowland Paddy in Several Provinces (1990)

Pest / deseases		Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Stem borer	Area (ha)	8,041	59,538	23,158	9,385	7,180	4,643	6,429	3,560	2,656	2,508	3,214	4,676	134,988
	Intensity (%)	10.7	37.0	29.3	17.6	11.4	12.0	16.0	13.2	10.3	15.0	12.0	12.4	26.5
BPH	Area (ha)	1,206	3,149	2,655	412	706	959	1,190	517	369	219	86	490	11,958
	Intensity (%)	17.5	10.1	14.9	26.8	11.2	16.7	11.9	18.6	29.5	10.1	17.5	7.6	14.2
Gall midge	Area (ha)	1,629	5,155	1,431	165	433	586	463	226	119	56	52	189	10,504
	Intensity (%)	10.2	13.5	11.8	12.3	8.2	10.3	7.2	12.0	10.7	23.1	11.0	12.6	12.0
Rat	Area (ha)	15,777	16,092	11,121	5,540	13,533	20,656	13,616	8,537	4,265	2,329	3,058	5,426	118,000
	Intensity (%)	16.5	15.7	21.1	22.7	12.2	20.8	21.3	20.7	19.0	18.9	15.9	12.7	18.0
Army worm	Area (ha)	746	430	1,397	6,035	948	182	269	309	209	322	187	431	11,465
	Intensity (%)	16.5	15.6	10.8	18.9	23.9	14.0	23.4	15.6	19.5	20.0	12.8	9.1	17.6
Leaf folder	Area (ha)	7,982	9,233	5,793	2,830	3,062	3,198	3,327	2,592	1,523	1,682	1,750	3,516	46,488
	Intensity (%)	15.2	14.3	14.2	15.2	13.7	14.0	14.6	15.7	19.7	14.2	14.6	15.5	14.8
Rice bug	Area (ha)	1,789	2,595	5,682	4,484	4,022	2,032	1,404	1,616	1,640	821	1,272	819	28,176
	Intensity (%)	11.0	10.3	11.2	10.3	17.6	12.0	15.7	12.0	12.4	13.1	17.7	16.8	12.8
Scotinophora	Area (ha)	258	194	135	144	288	122	238	65	26	16	145	522	2,153
	Intensity (%)	22.5	13.3	9.7	14.0	11.2	16.5	13.0	19.0	7.7	15.2	7.5	8.9	12.9
Wild pig	Area (ha)	539	555	323	94	163	88	44	81	134	446	94	422	2,983
	Intensity (%)	11.7	15.1	12.4	23.0	46.5	22.9	21.5	14.9	13.4	16.0	14.0	15.7	16.6
Bird	Area (ha)	137	242	37	95	71	109	187	248	229	163	201	85	1,804
	Intensity (%)	17.8	22.8	19.2	17.6	29.7	30.9	16.0	11.0	17.4	13.7	11.0	14.8	17.3
Blast	Area (ha)	700	560	403	258	724	543	515	90	61	30	108	152	4,144
	Intensity (%)	16.4	13.9	11.7	42.5	9.3	14.0	26.4	14.8	9.0	11.2	22.8	14.8	16.8
Sheath rot	Area (ha)	898	652	537	86	228	465	807	74	44	25	27	98	3,941
	Intensity (%)	7.2	6.4	13.8	16.9	8.7	6.7	16.3	15.7	17.3	16.0	11.9	25.9	10.8
B.L.spot	Area (ha)	286	1,158	638	167	263	461	1,309	128	90	89	105	112	4,806
	Intensity (%)	12.3	26.0	20.1	13.4	17.6	11.6	16.4	17.1	14.9	11.9	12.3	16.8	18.4
BLB	Area (ha)	1,110	2,444	951	222	894	418	1,702	318	115	158	109	135	8,576
	Intensity (%)	12.8	13.0	14.8	14.2	10.4	13.7	39.2	18.2	10.2	12.2	16.1	20.9	18.5
RTV	Area (ha)	865	811	482	755	1,553	436	148	73	112	178	471	494	6,378
	Intensity (%)	17.9	21.6	13.1	21.3	20.1	19.2	18.2	14.4	30.0	16.8	19.1	15.8	19.1
Yellow dwarf	Area (ha)	32	8	9	112	24	27	24	0	0	1	0	13	250
	Intensity (%)	17.1	5.6	11.3	25.0	22.5	11.4	31.0	0.0	0.0	1.2	0.0	8.3	20.8
RGSV	Area (ha)	54	98	67	3	4	1	1	17	11	1	1	0	258
	Intensity (%)	14.3	38.1	11.6	25.0	16.2	19.3	15.0	13.8	13.3	20.0	5.0	0.0	22.7
Orange leaf	Area (ha)	5	3	1	7	13	14	4	3	2	1	2	8	63
	Intensity (%)	5.0	20.0	2.0	27.6	19.7	6.2	16.0	8.0	10.0	4.0	6.0	8.0	12.8
Empty grain	Area (ha)	113	99	82	62	32	113	322	402	549	53	0	0	1,827
	Intensity (%)	4.8	16.0	13.3	8.3	11.5	15.3	12.2	11.4	11.9	15.0	0.0	0.0	11.8
Others	Area (ha)	3,957	1,998	1,545	761	1,008	359	264	415	368	161	325	436	11,597
	Intensity (%)	17.3	15.4	19.2	9.2	14.4	15.3	8.8	15.2	7.3	16.3	20.6	21.7	15.9
Total	Area (ha)	45,589	104,239	56,263	31,406	35,084	33,174	31,939	19,138	12,403	9,261	10,850	17,854	407,200
	Intensity (%)	14.7	27.5	21.6	17.7	13.6	17.6	19.0	17.1	15.9	15.8	15.2	13.6	19.7

Remarks: Damaged area and intensity are recorded in 20 provinces only.

Source: Area and Intensity of Pest, Insects and Calamity of Paddy and Secondary Crops in Indonesia 1990, CBS

Table 3.20 Harvested Area, Yield and Production of Lowland Paddy by Different Ecosystem 1989

Province	Whole area			Irrigated area			Rainfed area			Other area		
	Harvested area (000ha)	Yield (ton/ha)	Production (000 ton)	Harvested area (000ha)	Yield (ton/ha)	Production (000 ton)	Harvested area (000ha)	Yield (ton/ha)	Production (000 ton)	Harvested area (000ha)	Yield (ton/ha)	Production (000 ton)
11 D.I. Aceh	292.6	3.872	1,132.7	149.8	4.150	621.7	127.4	3.860	491.8	15.4	1.253	19.2
12 Sumatera Utara	599.5	3.953	2,369.8	427.7	4.210	1,800.6	156.5	3.520	550.9	15.3	1.197	18.3
13 Sumatera Barat	341.5	4.521	1,543.6	275.0	4.693	1,290.5	65.9	3.816	251.5	0.6	2.839	1.6
14 Riau	96.1	3.195	307.1	38.1	3.590	136.8	23.7	3.520	83.4	34.3	2.531	86.9
15 Jambi	136.2	3.229	439.9	67.0	3.790	253.9	27.2	3.450	93.8	42.0	2.192	92.2
16 Sumatera Selatan	341.8	3.353	1,145.8	98.8	4.728	467.1	39.6	3.880	153.6	203.4	2.582	525.1
17 Bengkulu	68.1	3.456	235.2	59.6	3.570	212.8	4.6	3.680	16.9	3.9	1.435	5.5
18 Lampung	248.3	4.165	1,034.0	175.5	4.280	751.1	64.9	4.060	263.5	7.9	2.464	19.4
Sumatera	2,124.0	3.865	8,208.2	1,291.5	4.285	5,534.5	509.8	3.738	1,905.5	322.7	2.381	768.2
31 D.K.I. Jakarta	8.4	4.674	39.2	7.5	4.720	35.4	0.8	4.480	3.6	0.0	.000	0.2
32 Jawa Barat	1,973.7	5.029	9,925.2	1,552.0	5.162	8,011.4	415.1	4.560	1,892.9	6.6	3.152	20.9
33 Jawa Tengah	1,494.2	5.128	7,662.4	1,075.5	5.406	5,814.2	414.2	4.444	1,840.6	4.5	1.676	7.6
34 Yoguyakarta	101.6	5.323	540.6	87.0	5.491	477.7	14.6	4.322	62.9	0.0	.000	0.0
35 Jawa Timur	1,521.0	5.263	8,004.3	1,219.0	5.438	6,628.9	300.8	4.564	1,372.9	1.2	2.125	2.5
Jawa	5,098.9	5.133	26,171.7	3,941.0	5.320	20,967.6	1,145.5	4.516	5,172.8	12.4	2.510	31.2
51 Bali	172.6	5.050	871.4	171.0	5.065	866.1	1.2	3.500	4.2	0.4	3.014	1.1
52 Nusatenggara Barat	250.5	4.307	1,078.9	204.5	4.589	938.5	41.3	3.153	130.2	4.7	2.172	10.2
53 Nusatenggara Timur	67.6	3.021	204.3	54.7	3.399	185.9	9.4	1.574	14.8	3.5	1.017	3.6
54 Timor Timur	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bali & Nusatenggara	490.7	4.391	2,154.6	430.2	4.627	1,990.5	51.9	2.875	149.2	8.6	1.734	14.9
61 Kalimantan Barat	200.1	2.632	526.7	91.6	2.880	263.8	58.6	2.730	160.0	49.9	2.062	103.0
62 Kalimantan Tengah	87.8	2.131	187.1	21.9	2.230	48.8	18.7	2.133	39.9	47.2	2.084	98.4
63 Kalimantan Selatan	313.0	2.811	879.9	47.9	3.330	159.5	79.0	2.810	222.0	186.1	2.678	498.4
64 Kalimantan Timur	39.3	2.646	104.0	6.1	2.990	18.2	22.1	2.650	58.6	11.1	2.448	27.2
Kalimantan	640.3	2.652	1,697.8	167.5	2.928	490.4	178.4	2.693	480.4	294.4	2.470	726.9
71 Sulawesi Utara	71.7	4.166	298.5	62.1	4.220	262.1	6.2	4.180	25.9	3.4	3.129	10.5
72 Sulawesi Tengah	107.6	3.254	350.2	97.7	3.410	333.2	6.1	2.050	12.5	3.8	1.193	4.6
73 Sulawesi Selatan	771.5	4.248	3,277.1	498.2	4.497	2,240.4	264.5	3.900	1,031.6	8.8	.585	5.1
74 Sulawesi Tenggara	40.4	3.346	135.1	32.5	3.580	116.4	3.4	2.880	9.8	4.5	2.004	9.0
Sulawesi	991.1	4.097	4,060.9	690.5	4.275	2,952.0	280.2	3.854	1,079.8	20.4	1.427	29.2
81 Maluku	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
82 Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Maluku & Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Indonesia	9,344.9	4.526	42,293.1	6,520.7	4.897	31,935.0	2,165.8	4.058	8,787.7	658.5	2.385	1,570.4

Source: JICA-FIDP team calculation by regression method based on Agricultural Survey Production of Cereals in Indonesia, 1989; CBS

Table 3.21 Harvested Area, Yield and Production of Lowland Paddy by Different Ecosystem 1990

Province	Whole Area			Irrigated Acrea			Rainfed Area			Other Area		
	Harvested Area(000ha)	Yield (t/ha)	Production (000t)	Harvested Area (ha)	Yield (t/ha)	Production (000t)	Harvested Area (ha)	Yield (t/ha)	Production (000t)	Harvested Area(000ha)	Yield (t/ha)	Production (000t)
11. D. I. Aceh	291.6	3.956	1,154.2	160.6	4.198	674.2	116.9	3.840	448.7	14.1	2.212	31.3
12. Sumatera Utara	618.9	4.008	2,478.5	354.3	4.311	1,527.4	241.3	3.812	919.8	23.3	1.344	31.3
13. Sumatera Barat	351.9	4.602	1,619.4	268.0	4.666	1,250.6	82.5	4.419	364.5	1.3	3.218	4.3
14. Riau	102.7	3.222	330.9	17.3	3.196	55.4	29.9	3.125	93.5	55.4	3.282	181.9
15. Jambi	145.2	3.273	475.2	31.3	3.736	117.0	28.4	3.727	105.9	85.5	2.952	252.4
16. Sumatera Selatan	353.2	3.408	1,203.2	67.0	4.178	280.0	71.0	4.434	314.7	215.2	2.827	608.4
17. Benkulu	65.9	3.550	234.1	47.2	3.578	168.8	11.5	3.583	41.0	7.3	3.320	24.2
18. Lampung	264.1	4.204	1,110.2	185.9	4.429	823.3	72.0	3.768	271.2	6.2	2.542	15.7
Sumatera	2,193.4	3.924	8,605.7	1,131.7	4.327	4,896.8	653.4	3.917	2,559.4	408.4	2.815	1,149.6
31. D.K.I. Jakarta	8.3	4.745	39.2	6.1	4.765	29.2	2.1	4.742	9.8	0.1	2.885	0.2
32. Jawa Barat	1,969.2	5.181	10,024.6	1,640.7	5.274	8,653.3	322.7	4.219	1,361.6	5.7	1.694	9.7
33. Jawa Tengah	1,485.0	5.423	7,693.2	1,078.1	5.445	5,870.0	404.7	4.487	1,816.1	2.2	3.255	7.0
34. D.I. Yogyakarta	98.3	5.331	533.3	94.0	5.463	513.3	4.4	4.570	20.0	0.0	.000	0.0
35. Jawa Timur	1,502.7	5.194	8,011.5	1,216.4	5.477	6,662.2	284.3	4.727	1,343.8	2.0	2.751	5.6
Jawa	5,063.5	5.194	26,301.7	4,035.3	5.385	21,727.9	1,018.2	4.470	4,551.3	10.0	2.253	22.5
51. Bali	165.0	5.141	848.4	163.1	5.148	839.9	1.6	4.848	7.7	0.3	2.779	0.8
52. Nusatenggara Barat	251.0	4.386	1,100.8	210.5	4.585	965.1	40.5	3.349	135.7	0.0		0.0
53. Nusatenggara Timur	68.0	3.098	210.8	53.7	3.206	172.3	11.1	2.742	30.4	3.2	2.511	8.0
54. Timor Timur	na	na	na	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	484.1	4.462	2,159.9	427.4	4.627	1,977.2	53.2	3.268	173.9	3.5	2.534	8.9
61. Kalimantan Barat	185.3	2.673	495.5	78.5	3.449	270.9	61.9	1.861	115.2	44.9	2.438	109.4
62. Kalimantan Tengah	100.7	2.150	216.6	58.3	2.233	130.1	15.3	2.071	31.6	27.2	2.016	54.9
63. Kalalimantan Selatan	330.9	2.825	934.7	25.6	3.712	95.1	130.5	3.078	401.8	174.7	2.506	437.8
64. Kalimantan Timur	40.3	2.697	108.8	4.3	3.165	13.6	2.0	3.015	6.0	34.0	2.619	89.2
Kalimantan	657.3	2.671	1,755.5	166.7	3.057	509.7	209.7	2.645	554.6	280.8	2.461	691.3
71. Sulawesi Utara	75.2	4.176	318.3	65.6	4.413	289.4	8.0	2.848	22.7	1.7	3.706	6.2
72. Sulawesi Tengah	111.8	3.298	368.8	106.4	3.345	356.1	3.7	2.809	10.5	1.6	1.375	2.2
73 Sulawesi Selatan	725.1	4.269	3,109.9	484.0	4.438	2,148.2	231.9	4.023	932.6	9.2	3.166	29.0
74. Sulawesi Tenggara	39.9	3.401	135.7	33.8	3.496	118.3	3.8	3.036	11.7	2.2	2.584	5.8
Sulawesi	952.0	4.127	3,932.7	689.9	4.221	2,912.0	247.4	3.951	977.5	14.7	2.940	43.3
81. Maluku	na	na	na	na	na	na	na	na	na	na	na	na
82. Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Indonesia	9,350.3	4.573	42,755.6	6,450.9	4.964	32,023.5	2,181.9	4.041	8,816.6	717.4	2.670	1,915.4

Source: JICA- FIDP team calculation by regression method based on Agricultural Survey Production of Cereals in Indonesia 1990, CBS.

Table 3.22 Harvested area, Yield and Production of lowland paddy by different ecosystem 1991

Province	Whole Area			Irrigated Aerea			Rainfed Area			Other Area		
	Harvested Area(000ha)	Yield (t/ha)	Production (000t)	Harvested Area(000ha)	Yield (t/ha)	Production (000t)	Harvested Area(000ha)	Yield (t/ha)	Production (000t)	Harvested Area(000ha)	Yield (t/ha)	Production (000t)
11. D. I. Aceh	299.9	4.033	1,209.4	162.7	4.419	719.1	126.2	3.599	454.1	11.0	3.290	36.1
12. Sumatera Utara	645.9	4.002	2,584.7	402.2	4.181	1,681.4	232.9	3.743	871.6	10.9	2.918	31.7
13. Sumatera Barat	361.8	4.637	1,677.8	281.1	5.075	1,426.8	80.3	3.111	249.8	0.4	2.955	1.2
14. Riau	112.5	3.232	363.6	23.6	3.864	91.4	44.8	3.135	140.4	44.1	2.992	131.8
15. Jambi	138.3	3.291	455.2	36.6	4.062	148.7	31.6	3.699	117.0	70.1	2.704	189.5
16. Sumatera Selatan	304.8	3.487	1,062.6	82.2	4.131	339.5	51.7	4.295	222.1	170.9	2.932	501.0
17. Benkulu	75.5	3.611	272.6	69.6	3.606	250.9	3.8	4.172	15.8	2.1	2.788	5.9
18. Lampung	254.0	4.286	1,088.6	205.2	4.511	925.8	35.1	3.595	126.3	13.6	2.674	36.5
Sumatera	2,192.7	3.974	8,714.5	1,263.3	4.420	5,583.7	606.4	3.623	2,197.0	323.0	2.891	933.8
31. D.K.I. Jakarta	5.8	4.757	27.3	5.6	4.777	26.8	0.1	2.847	0.4	0.0	2.325	0.1
32. Jawa Barat	1,837.0	5.188	9,529.7	1,534.8	5.425	8,326.4	295.6	4.001	1,182.7	6.6	3.131	20.6
33. Jawa Tengah	1,425.6	5.241	7,471.1	1,014.6	5.569	5,650.1	408.3	4.443	1,814.1	2.7	2.531	6.9
34. D.I. Yogyakarta	98.9	5.467	540.9	85.6	5.721	489.6	13.4	3.842	51.3	0.0	0.000	0.0
35. Jawa Timur	1,480.8	5.393	7,985.8	1,232.6	5.508	6,789.0	246.8	4.835	1,193.2	1.4	2.511	3.6
Jawa	4,848.1	5.271	25,554.8	3,873.1	5.495	21,281.9	964.2	4.399	4,241.6	10.8	2.895	31.1
51. Bali	156.3	5.236	818.3	154.5	5.261	812.9	1.4	3.173	4.4	0.4	2.511	1.0
52. Nusatenggara Barat	246.9	4.482	1,106.4	218.4	4.582	1,000.8	28.4	3.714	105.6	0.0	0.000	0.0
53. Nusatenggara Timur	79.8	3.107	247.9	72.6	3.171	230.1	6.9	2.479	17.2	0.3	2.065	0.6
54. Timor Timur	na	na	na	na	na	na	na	na	na	na	na	na
Bali & Nusatenggara	483.0	4.499	2,172.7	445.5	4.588	2,043.9	36.8	3.461	127.2	0.7	2.322	1.6
61. Kalimantan Barat	180.0	2.726	490.4	46.7	4.546	212.4	99.8	2.143	213.7	33.5	1.919	64.3
62. Kalimantan Tengah	89.0	2.375	211.5	13.7	0.716	9.8	17.6	1.364	24.0	57.8	3.075	177.7
63. Kalalimantan Selatan	331.9	2.904	963.9	26.9	5.710	153.7	135.4	2.778	376.0	169.6	2.560	434.2
64. Kalimantan Timur	45.0	2.748	123.7	10.9	2.768	30.2	16.5	2.558	42.1	17.6	2.914	51.3
Kalimantan	645.9	2.771	1,789.5	98.2	4.135	406.1	269.2	2.437	655.9	278.5	2.612	727.5
71. Sulawesi Utara	82.1	4.232	347.6	68.6	4.425	303.8	13.2	3.256	43.1	0.2	2.977	0.7
72. Sulawesi Tengah	129.0	3.308	426.8	125.9	3.327	418.7	3.1	2.549	7.9	0.1	2.226	0.2
73 Sulawesi Selatan	706.1	4.353	3,073.4	488.0	4.621	2,255.3	208.6	3.807	794.1	9.4	2.557	24.1
74. Sulawesi Tenggara	42.7	3.427	146.3	39.5	3.490	137.9	0.4	2.817	1.1	2.8	2.623	7.3
Sulawesi	959.9	4.161	3,994.1	722.0	4.315	3,115.6	225.3	3.755	846.2	12.5	2.577	32.3
81. Maluku	na	na	na	na	na	na	na	na	na	na	na	na
82. Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na	na	na	na	na	na
Indonesia	9,129.6	4.617	42,225.5	6,402.2	5.066	32,431.1	2,101.9	3.838	8,067.9	625.5	2.760	1,726.3

Source: JICA-FIDP team calculation by regression method based on Agricultural Survey Production of Cereals in Indonesia 1991, CBS

Table 3.23 Yield and Area of Lowland Paddy under Intensification Programme 1989

Province	Paddy yield (t/ha)			Lowland area (000ha)			Intensification area (000ha)			Amount of applied fertilizer (kg/ha)			
	Int.	Non-int.	Ave.	Int.	Non-int.	Total	Sup.ins.	Ins.	Inm.	Urea	TSP	Others	Total
11 D.I. Aceh	4.15	3.18	3.85	253.7	58.5	312.1	15.7	91.5	146.5	150.5	69.3	6.6	226.4
12 Sumatera Utara	4.06	2.95	3.95	716.7	31.3	748.0	194.6	402.2	119.9	166.3	106.4	44.1	316.8
13 Sumatera Barat	4.52	3.49	4.52	350.1	0.3	350.4	77.4	255.5	17.2	141.3	115.7	50.9	307.9
14 Riau	3.31	2.67	3.20	75.1	17.3	92.4	0.0	40.1	35.0	99.6	68.8	22.3	190.7
15 Jambi	3.44	2.70	3.23	91.4	29.4	120.8	0.0	46.5	44.9	29.4	72.0	7.2	108.6
16 Sumatera Selatan	3.53	2.51	3.35	320.7	41.2	362.0	55.7	181.2	83.9	153.3	124.8	9.6	287.7
17 Bengkulu	3.57	3.00	3.46	60.9	8.9	69.8	3.6	21.8	35.4	123.0	77.0	12.7	212.7
18 Lampung	4.18	3.03	4.17	244.6	1.3	245.9	81.8	116.6	46.2	166.6	133.9	59.7	360.2
Sumatera	4.01	2.88	3.87	2,113.2	188.2	2,301.4	428.8	1,155.4	529.0	146.7	106.1	34.1	286.9
31 D.K.I. Jakarta	na	na	na	8.6	0.0	8.6	0.0	4.6	4.1	na	na	na	na
32 Jawa Barat	5.03	3.03	5.03	2,036.1	0.1	2,036.1	704.5	1,163.0	168.5	228.0	141.5	64.6	434.1
33 Jawa Tengah	5.13	3.36	5.13	1,596.3	0.0	1,596.3	354.6	1,030.4	211.6	237.0	113.5	138.4	488.9
34 Yoguyakarta	5.32	0.00	5.32	104.7	0.0	104.7	54.0	44.4	6.3	249.1	87.9	28.0	365.0
35 Jawa Timur	5.27	2.93	5.26	1,623.2	5.4	1,628.6	396.6	1,075.2	151.3	292.1	99.9	35.5	427.5
Jawa	5.14	2.98	5.13	5,368.9	5.5	5,374.3	1,509.7	3,317.6	541.8	250.2	119.8	47.5	417.5
51 Bali	5.05	3.75	5.05	178.5	0.0	178.5	20.4	148.1	9.9	251.0	76.9	35.6	363.5
52 Nusatenggara Barat	4.33	3.28	4.31	256.6	8.6	265.2	76.2	83.6	96.8	245.0	80.5	18.5	344.0
53 Nusatenggara Timur	3.49	2.86	3.02	27.2	39.3	66.5	0.0	1.8	25.4	80.0	61.0	8.0	149.0
54 Timor Timur	na	na	na	7.9	10.3	18.2	0.0	1.6	6.3	na	na	na	na
Bali & Nusatenggara	4.58	2.91	4.39	470.2	58.2	528.4	96.6	235.1	138.4	282.8	78.3	24.8	385.9
61 Kalimantan Barat	2.88	2.28	2.63	139.3	89.3	228.7	0.0	67.8	71.5	124.6	71.4	53.9	249.9
62 Kalimantan Tengah	2.23	1.96	2.13	46.4	18.5	64.9	0.0	13.6	32.8	70.4	0.0	0.0	70.4
63 Kalimantan Selatan	2.83	2.31	2.81	314.8	5.8	320.6	0.0	127.6	187.3	105.9	71.9	19.1	196.9
64 Kalimantan Timur	2.99	2.09	2.65	33.8	11.5	45.3	0.0	12.0	21.8	47.2	40.7	5.3	93.2
Kalimantan	2.78	2.18	2.65	534.3	125.1	659.5	0.0	221.0	313.4	103.5	62.1	18.4	184.0
71 Sulawesi Utara	4.22	3.33	4.17	83.0	1.5	84.5	0.0	40.2	42.8	181.8	87.9	24.8	294.5
72 Sulawesi Tengah	3.50	2.45	3.25	92.1	19.2	111.3	0.0	50.5	41.6	162.9	46.8	6.6	216.3
73 Sulawesi Selatan	4.28	2.69	4.25	761.3	15.5	776.8	225.8	345.7	189.8	167.4	67.3	24.7	259.4
74 Sulawesi Tenggara	3.35	2.76	3.85	37.7	8.5	308.3	0.0	10.0	27.2	49.2	50.7	20.3	120.2
Sulawesi	4.17	2.60	4.10	974.1	44.7	1,280.9	225.8	446.4	301.4	163.0	66.3	20.9	250.2
81 Maluku	n.a.	n.a.	2.72	6.7	1.7	8.4	0.0	6.7	0.0	n.a.	n.a.	n.a.	n.a.
82 Irian Jaya	n.a.	n.a.	2.70	1.6	0.0	1.6	0.0	0.2	1.4	n.a.	n.a.	n.a.	n.a.
Maluku & Irian Jaya	n.a.	n.a.	2.70	8.3	1.7	10.0	0.0	6.9	1.4	n.a.	n.a.	n.a.	n.a.
Indonesia	4.63	2.67	4.53	9,469.0	423.4	10,154.5	2,260.9	5,382.4	1,825.4	212.3	105.8	39.3	357.4

Source: Cost Structure of Farms Paddy and Palawija 1989, CBS; Statistik Intensifikasi Pertanian 1990, CBS

Table 3.24 Change in Paddy Yield under Intensification Programme

unit : tons/ha

Province	1982	1983	1984	1985	1986	1987	1988
11 D.I. Aceh	3.81	3.94	3.67	3.88	3.99	3.96	4.03
12 Sumatera Utara	3.83	3.89	3.89	3.94	3.89	3.89	4.00
13 Sumatera Barat	3.98	4.11	4.11	4.19	4.19	4.29	4.43
14 Riau	3.10	3.23	3.09	3.14	3.12	2.99	3.06
15 Jambi	3.20	3.12	3.11	3.08	3.14	3.36	3.42
16 Sumatera Selatan	3.63	3.67	3.58	3.58	3.64	3.45	3.34
17 Bengkulu	3.52	3.67	3.51	3.44	3.60	3.22	3.34
18 Lampung	4.07	4.14	4.14	4.14	4.12	4.04	4.04
Sumatera	3.82	3.91	3.86	3.90	3.89	3.86	3.90
31 D.K.I. Jakarta	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
32 Jawa Barat	4.30	4.45	4.45	4.51	4.53	4.71	4.87
33 Jawa Tengah	4.52	4.79	4.83	4.80	4.80	4.94	5.01
34 Yoguyakarta	4.76	4.97	5.01	5.01	5.04	5.09	5.19
35 Jawa Timur	0.97	5.00	5.04	4.99	4.98	5.09	5.15
Jawa	4.58	4.73	4.75	4.75	4.75	4.90	5.00
51 Bali	4.42	4.45	4.59	4.63	4.72	4.81	4.91
52 Nusatenggara Barat	3.89	4.01	4.04	3.95	3.96	4.06	4.24
53 Nusatenggara Timur	3.30	3.37	3.12	3.23	3.42	3.23	3.29
54 Timor Timur	na	na	na	na	na	na	na
Bali & Nusatenggara	4.08	4.16	4.24	4.20	4.25	4.32	4.47
61 Kalimantan Barat	3.18	3.07	3.14	2.80	3.03	2.85	2.83
62 Kalimantan Tengah	2.31	2.25	2.20	2.31	2.42	2.11	2.16
63 Kalimantan Selatan	2.74	2.77	2.89	2.94	3.00	2.86	2.94
64 Kalimantan Timur	2.84	2.89	2.75	2.82	2.98	2.75	2.74
Kalimantan	2.85	2.81	2.88	2.85	2.96	2.77	2.83
71 Sulawesi Utara	4.11	4.08	4.27	4.32	4.27	4.02	4.09
72 Sulawesi Tengah	3.28	3.34	3.36	3.31	3.33	3.41	3.59
73 Sulawesi Selatan	4.15	4.16	4.21	4.20	4.21	4.04	4.17
74 Sulawesi Tenggara	3.25	3.53	3.30	3.11	3.15	3.22	3.23
Sulawesi	4.08	4.10	4.17	4.14	4.10	3.96	4.08
81 Maluku	na	na	na	na	na	na	na
82 Irian Jaya	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na
Indonesia	4.34	4.43	4.44	4.44	4.43	4.47	4.54

Source: Statistik Intensifikasi Pertanian 1990, CBS

Table 3.25 Change in Average Amount of Fertilizer Application Under Intensification Programme by Province

unit: kg/ha

Province	Urea							Total amount						
	1980	1982	1985	1986	1987	1988	1989	1980	1982	1985	1986	1987	1988	1989
11 D.I. Aceh	57.3	94.6	80.1	69.3	91.2	113.7	108.1	80.0	133.4	109.4	98.9	132.1	167.3	162.4
12 Sumatera Utara	84.8	108.4	134.0	131.5	127.2	146.4	150.6	145.1	180.6	250.3	247.2	235.0	273.6	287.0
13 Sumatera Barat	132.8	138.0	140.8	136.9	119.2	126.0	141.1	192.5	223.3	234.5	231.8	227.6	284.3	367.4
14 Riau	37.5	41.4	42.9	94.3	83.6	67.2	81.9	48.4	53.7	75.2	138.6	164.7	128.9	156.7
15 Jambi	0.0	10.7	11.8	20.1	95.6	65.9	21.0	0.0	17.1	13.6	37.8	153.8	83.4	77.5
16 Sumatera Selatan	9.2	42.4	37.0	69.8	92.8	139.0	126.1	12.7	65.2	62.7	120.8	166.5	249.0	238.2
17 Bengkulu	0.0	40.2	48.9	59.2	52.8	92.5	100.6	0.0	82.4	80.4	103.3	99.4	174.9	173.2
18 Lampung	68.7	137.2	147.9	168.5	186.8	186.2	164.8	97.2	225.6	264.5	283.4	355.9	385.5	356.3
Sumatera	73.4	92.5	97.6	105.6	116.8	131.5	128.0	111.2	148.3	168.7	182.5	211.8	248.2	250.4
31 D.K.I. Jakarta	na	na	na	na	na	na	naa	na	na	na	na	na	na	na
32 Jawa Barat	180.5	200.4	211.3	207.0	200.2	229.9	228.0	254.7	288.8	314.8	317.0	322.5	402.7	434.0
33 Jawa Tengah	199.6	225.9	239.1	227.4	233.9	243.5	236.9	254.7	309.1	326.8	328.5	330.9	393.4	388.7
34 Yogyakarta	262.2	294.2	298.4	287.3	304.9	314.4	249.1	304.7	347.4	369.0	354.2	386.1	418.1	365.1
35 Jawa Timur	267.7	267.2	295.6	297.0	284.0	297.9	291.3	327.4	339.6	392.1	393.8	365.2	440.7	426.3
Jawa	213.5	230.6	246.5	276.0	237.1	255.9	249.9	277.2	311.8	342.6	378.1	347.4	411.7	417.7
51 Bali	192.0	221.7	204.7	207.9	212.4	202.8	247.8	217.0	264.0	254.9	256.5	271.9	270.8	358.9
52 Nusatenggara Barat	180.9	196.0	204.3	112.7	212.2	240.6	291.6	212.1	234.7	245.4	118.6	272.6	338.5	382.1
53 Nusatenggara Timur	26.7	61.5	30.8	30.3	32.8	31.9	15.3	39.1	91.3	46.7	46.3	51.3	57.5	25.8
54 Timor Timur	na	na	na	na	na	na	naa	na	na	na	na	na	na	na
Bali & Nusatenggara	179.9	187.6	182.3	138.9	189.6	198.8	217.2	207.8	226.5	223.5	163.1	227.8	276.3	305.4
61 Kalimantan Barat	27.1	65.8	45.1	39.9	107.0	68.9	74.0	37.7	97.7	75.3	62.1	132.2	81.9	148.4
62 Kalimantan Tengah	2.0	12.8	12.2	22.1	236.6	13.2	45.7	2.0	18.6	21.8	35.4	269.4	13.2	45.7
63 Kalimantan Selatan	23.4	43.7	42.7	48.6	86.0	41.2	103.4	32.1	73.1	72.6	72.9	135.9	88.5	182.3
64 Kalimantan Timur	20.9	3.2	23.4	23.6	41.2	18.7	29.2	33.3	4.1	38.4	34.5	56.3	34.8	57.6
Kalimantan	21.9	46.7	38.2	41.4	109.4	44.0	61.5	30.5	73.4	64.7	63.1	161.6	72.8	119.3
71 Sulawesi Utara	117.0	148.0	110.8	68.7	119.6	139.7	172.6	149.0	206.0	161.3	102.4	169.1	203.0	279.4
72 Sulawesi Tengah	39.0	51.8	37.1	88.9	102.5	75.2	124.3	50.2	62.0	44.8	121.1	152.8	102.7	165.2
73 Sulawesi Selatan	63.9	103.3	132.4	142.5	139.5	151.6	164.5	88.1	157.8	175.9	197.1	202.3	228.5	254.8
74 Sulawesi Tenggara	19.4	38.1	90.4	152.5	40.6	151.0	48.6	25.8	53.3	129.2	230.7	104.7	261.4	118.8
Sulawesi	65.4	101.0	121.1	132.6	130.2	141.7	157.0	89.0	150.4	161.8	184.7	190.4	213.8	242.4
81 Maluku	na	na	na	na	na	na	naa	na	na	na	na	na	na	na
82 Irian Jaya	na	na	na	na	na	na	naa	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	naa	na	na	na	na	na	na	na
Indonesia	154.6	201.4	184.7	201.4	188.0	198.0	200.7	203.2	283.7	262.4	283.7	283.3	328.9	337.9

Source:BIMAS

Table 3.26 Change in Harvested Area of Paddy Field under Intensification Programme

unit : 000ha

Province	1982	1983	1984	1985	1986	1987	1988
11 D.I. Aceh	103.9	124.1	161.7	149.2	169.9	174.9	197.2
12 Sumatera Utara	346.7	352.7	413.8	450.2	456.9	515.8	546.6
13 Sumatera Barat	256.3	297.4	315.2	317.8	331.3	331.3	333.8
14 Riau	37.1	37.0	59.2	65.7	72.1	54.5	76.4
15 Jambi	30.5	32.1	32.6	35.8	79.6	70.2	81.9
16 Sumatera Selatan	60.1	114.3	123.6	139.7	155.0	236.4	297.9
17 Bengkulu	25.4	36.1	32.0	39.9	47.8	54.2	53.9
18 Lampung	129.8	151.1	182.4	187.1	206.9	245.2	242.3
Sumatera	989.8	1,144.8	1,320.5	1,385.4	1,519.5	1,682.5	1,830.0
31 D.K.I. Jakarta	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32 Jawa Barat	1,652.3	1,663.0	1,823.2	1,918.8	1,936.3	1,904.1	1,890.3
33 Jawa Tengah	1,216.6	1,225.9	1,383.0	1,412.5	1,427.0	1,401.3	1,406.5
34 Yoguyakarta	100.4	102.8	109.8	103.4	104.2	96.9	97.6
35 Jawa Timur	1,373.0	1,383.7	1,455.5	1,475.6	1,496.8	1,443.5	1,451.4
Jawa	4,342.3	4,375.4	4,771.5	4,910.3	4,964.3	4,845.8	4,845.8
51 Bali	163.0	162.6	162.2	162.8	162.5	167.1	160.2
52 Nusatenggara Barat	189.3	186.8	205.5	215.2	212.4	220.5	225.3
53 Nusatenggara Timur	24.0	29.3	13.6	17.0	18.0	19.1	20.1
54 Timor Timur	na	na	na	na	na	na	na
Bali & Nusatenggara	376.3	378.7	381.3	395.0	392.9	406.7	405.6
61 Kalimantan Barat	77.4	88.9	89.8	94.6	92.0	81.3	93.9
62 Kalimantan Tengah	24.6	32.4	32.4	32.6	32.3	36.7	37.1
63 Kalimantan Selatan	110.8	136.4	157.6	169.7	170.4	217.5	234.5
64 Kalimantan Timur	25.4	6.8	8.5	9.9	9.8	12.6	12.2
Kalimantan	238.2	264.5	288.3	306.8	304.5	348.1	377.7
71 Sulawesi Utara	42.2	55.8	50.3	53.8	67.5	68.8	64.6
72. Sulawesi Tengah	22.4	27.3	25.7	26.0	63.1	68.4	66.5
73. Sulawesi Selatan	327.7	438.6	518.9	565.6	586.2	603.0	661.4
74 Sulawesi Tenggara	4.1	9.7	13.0	18.2	25.4	26.8	30.5
Sulawesi	396.4	531.4	607.9	663.6	742.2	767.0	823.0
81 Maluku	na	na	na	na	na	na	na
82 Irian Jaya	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na
Indonesia	6,343.0	6,694.8	7,369.5	7,661.1	7,923.4	8,050.1	8,282.1

Source: Statistik Intensifikasi Pertanian 1990, CBS

Table 3.27 Change in Paddy Production under Intensification Programme

unit : 000 ton

Province	1982	1983	1984	1985	1986	1987	1988
11 D.I. Aceh	396	488	594	579	678	693	795
12 Sumatera Utara	1,329	1,373	1,611	1,773	1,777	2,008	2,186
13 Sumatera Barat	1,009	1,221	1,296	1,331	1,387	1,422	1,478
14 Riau	115	120	183	206	225	163	234
15 Jambi	98	100	101	110	250	236	280
16 Sumatera Selatan	218	420	443	500	564	814	996
17 Bengkulu	90	133	112	138	172	174	181
18 Lampung	528	625	756	774	851	989	985
Sumatera	3,782	4,479	5,095	5,409	5,905	6,498	7,134
31 D.K.I. Jakarta	0	0	0	0	0	0	0
32 Jawa Barat	7,104	7,401	8,114	8,665	8,769	8,971	9,201
33 Jawa Tengah	5,503	5,875	6,684	6,775	6,855	6,915	7,045
34 Yoguyakarta	478	511	550	518	525	494	506
35 Jawa Timur	6,818	6,912	7,332	7,356	7,450	7,341	7,476
Jawa	19,903	20,699	22,680	23,313	23,599	23,721	24,228
51 Bali	721	728	744	754	767	803	790
52 Nusatenggara Barat	736	750	830	849	843	894	956
53 Nusatenggara Timur	79	99	42	55	62	62	68
54 Timor Timur	na	na	na	na	na	na	na
Bali & Nusatenggara	1,536	1,576	1,617	1,658	1,671	1,758	1,814
61 Kalimantan Barat	247	273	282	271	279	232	265
62 Kalimantan Tengah	57	73	71	75	80	78	80
63 Kalimantan Selatan	304	378	455	500	512	622	691
64 Kalimantan Timur	72	20	23	28	29	34	34
Kalimantan	679	743	831	874	900	965	1,069
71 Sulawesi Utara	173	228	215	232	288	277	264
72 Sulawesi Tengah	73	91	87	86	210	233	239
73 Sulawesi Selatan	1,359	1,826	2,189	2,373	2,466	2,439	2,759
74 Sulawesi Tenggara	13	34	43	57	80	86	99
Sulawesi	1,619	2,179	2,533	2,747	3,045	3,035	3,362
81 Maluku	na	na	na	na	na	na	na
82 Irian Jaya	na	na	na	na	na	na	na
Maluku & Irian Jaya	na	na	na	na	na	na	na
Indonesia	27,518	29,677	32,756	34,001	35,120	35,977	37,608

Source: Statistik Intensifikasi Pertanian 1990. CBS

Table 4.1 Historical Change in Harvested Area of Lowland Paddy by Province 1980-1991

unit: 000 ha

Province	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
11. D.I.Aceh	208.4	245.7	244.2	256.0	258.8	247.1	281.3	261.0	272.5	292.6	291.6	299.9	318.8
12. Sumatera Utara	445.3	448.4	474.1	453.7	496.3	525.4	505.9	569.5	592.8	599.5	618.7	645.9	672.9
13. Sumatera Barat	291.2	274.6	287.2	312.8	327.7	325.4	334.4	334.3	335.4	341.5	351.9	361.8	374.1
14. Riau	81.8	85.3	83.7	83.5	89.2	90.2	98.9	70.6	99.0	96.1	102.7	112.5	106.8
15. Jambi	131.7	132.1	135.4	142.5	144.5	150.1	140.0	134.8	139.5	136.2	145.2	138.3	147.8
16. Sumatera Selatan	242.9	269.9	265.4	296.1	290.4	301.6	334.6	331.8	343.6	341.8	353.2	304.8	372.5
17. Bengkulu	48.2	46.5	50.6	57.1	61.0	62.3	65.8	68.2	67.9	68.1	65.9	75.5	86.4
18. Lampung	151.0	167.1	174.8	190.5	211.1	204.1	218.3	249.7	245.6	248.3	264.1	254.0	314.3
Sumatera	1,600.6	1,669.6	1,715.4	1,792.2	1,878.8	1,906.1	1,979.2	2,019.9	2,096.5	2,124.0	2,193.2	2,192.7	2,393.7
31. D.K.I.Jakarta	20.5	16.3	13.9	9.5	9.7	10.4	9.5	8.9	8.5	8.4	8.3	5.8	6.6
32. Jawa Barat	1,743.9	1,835.2	1,702.5	1,702.2	1,850.2	1,931.7	1,937.8	1,904.6	1,890.8	1,973.7	1,969.2	1,837.0	1,998.4
33. Jawa Tengah	1,296.3	1,371.9	1,281.6	1,268.1	1,413.0	1,433.9	1,437.7	1,407.7	1,407.6	1,494.2	1,485.0	1,425.6	1,517.2
34. D.I.Yogyakarta	99.7	108.3	100.4	102.8	109.8	103.4	104.2	97.0	97.6	101.6	98.3	98.9	96.9
35. Jawa Timur	1,368.5	1,447.8	1,403.0	1,405.9	1,478.8	1,493.5	1,508.0	1,455.5	1,455.4	1,521.0	1,502.7	1,480.8	1,539.8
Jawa	4,528.9	4,779.5	4,501.4	4,488.4	4,861.6	4,973.0	4,997.3	4,873.7	4,859.8	5,098.9	5,063.5	4,848.1	5,159.0
51. Bali	174.9	166.7	165.5	164.2	164.8	164.2	164.0	167.4	160.3	172.6	165.0	156.3	158.9
52. Nusa Tenggara Barat	199.6	221.8	229.9	216.5	232.6	234.8	231.8	230.3	233.5	250.5	251.0	246.9	245.8
53. Nusa Tenggara Timur	48.2	53.3	59.1	62.3	57.5	58.4	61.7	57.6	62.4	67.6	68.0	79.8	80.1
54. Timor Timur	na	na	na	na	na	na	na	18.4	16.6	15.6	17.7	24.2	19.4
Bali & Nusatenggara	422.8	441.8	454.5	443.0	454.9	457.4	457.4	455.3	456.2	490.7	484.1	483.0	504.2
61. Kalimantan Barat	187.8	194.5	184.8	169.1	170.8	179.9	175.0	164.3	176.5	200.1	185.3	180.0	194.2
62. Kalimantan Tengah	72.1	73.0	74.0	75.5	75.5	76.0	77.6	80.5	81.5	87.8	100.7	89.0	94.1
63. Kalimantan Selatan	268.6	288.1	268.4	275.6	290.2	299.4	300.5	298.5	302.5	313.0	330.9	331.9	364.7
64. Kalimantan Timur	36.3	40.3	43.3	27.3	34.2	39.8	39.4	41.7	40.4	39.3	40.3	45.0	44.0
Kalimantan	564.9	595.9	570.5	547.5	570.6	595.1	592.4	584.9	600.9	640.2	657.3	645.9	696.9
71. Sulawesi Utara	55.8	50.2	60.2	62.9	59.0	62.5	72.7	76.4	69.7	71.7	76.2	82.1	67.2
72. Sulawesi Tengah	70.2	67.6	69.8	77.9	73.5	74.1	89.3	94.3	103.1	107.6	111.8	129.0	126.1
73. Sulawesi Selatan	564.9	570.8	486.5	555.3	625.0	663.3	666.4	640.0	681.1	771.5	725.1	706.1	786.8
74. Sulawesi Tenggara	14.2	14.0	12.3	17.0	21.5	21.3	28.1	28.5	30.7	40.4	39.9	42.7	54.8
Sulawesi	705.1	702.5	628.8	713.2	778.9	821.3	856.6	839.2	884.6	991.1	953.0	959.9	1,035.0
81. Maluku	0.5	0.5	0.6	1.1	0.9	1.1	3.2	3.1	3.9	3.4	3.0	5.1	0.8
82. Irian Jaya	1.3	1.3	1.4	1.4	1.5	1.7	1.9	1.6	6.9	10.9	5.8	9.6	9.5
Maluku & Irian Jaya	1.8	1.8	2.0	2.5	2.3	2.9	5.0	4.8	10.8	14.4	8.8	14.7	10.3
Indonesia	7,824.0	8,191	7,873	7,987	8,547	8,756	8,888	8,778	8,909	9,359	9,360	9,144	9,799

Source: Agricultural Survey Production of Cereals in Indonesia, 1980-1991, CBS

Table 4.2 Historical Change in Yield of Lowland Paddy by Province 1980-1991

unit : ton/ha

Province	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
11. D.I.Aceh	3.116	3.325	3.472	3.596	3.459	3.617	3.640	3.742	3.790	3.872	3.958	4.033	4.056
12. Sumatera Utara	3.158	3.339	3.506	3.619	3.714	3.764	3.782	3.779	3.911	3.953	4.006	4.002	4.035
13. Sumatera Barat	3.573	3.716	3.864	4.059	4.075	4.162	4.180	4.283	4.421	4.521	4.602	4.637	4.645
14. Riau	2.336	2.345	2.749	2.866	2.895	2.939	2.954	2.867	2.985	3.195	3.222	3.232	3.282
15. Jambi	2.797	2.833	2.945	2.882	2.899	2.916	2.961	3.128	3.204	3.229	3.273	3.291	3.389
16. Sumatera Selatan	2.903	2.961	3.063	3.103	3.174	3.241	3.224	3.213	3.232	3.353	3.406	3.487	3.490
17. Bengkulu	2.943	2.874	3.385	3.556	3.482	3.401	3.533	3.099	3.276	3.457	3.550	3.611	3.618
18. Lampung	3.329	3.570	3.814	3.915	3.963	4.037	4.050	4.015	4.053	4.165	4.204	4.286	4.311
Sumatera	3.127	3.257	3.439	3.543	3.577	3.642	3.656	3.696	3.771	3.865	3.924	3.974	3.996
31. D.K.I.Jakarta	2.992	3.205	3.520	3.447	3.574	3.603	4.336	4.291	4.544	4.672	4.745	4.757	4.785
32. Jawa Barat	3.677	3.868	4.262	4.421	4.430	4.504	4.535	4.711	4.867	5.029	5.091	5.188	5.207
33. Jawa Tengah	3.939	4.142	4.446	4.736	4.794	4.768	4.783	4.926	5.007	5.128	5.181	5.241	5.253
34. D.I.Yogyakarta	4.272	4.444	4.764	4.974	5.011	5.008	5.040	5.089	5.188	5.323	5.423	5.467	5.494
35. Jawa Timur	4.399	4.655	4.925	4.968	5.008	4.964	4.969	5.076	5.146	5.263	5.331	5.393	5.415
Jawa	3.980	4.196	4.530	4.692	4.723	4.727	4.748	4.889	4.997	5.133	5.194	5.271	5.288
51. Bali	4.101	4.435	4.400	4.463	4.569	4.619	4.705	4.804	4.930	5.050	5.141	5.236	5.262
52. Nusa Tenggara Barat	3.223	3.615	3.739	3.910	3.957	3.891	3.914	4.020	4.204	4.307	4.386	4.482	4.510
53. Nusa Tenggara Timur	2.510	2.648	3.024	3.189	3.111	3.134	3.124	2.891	2.971	3.021	3.098	3.107	3.114
54. Timor Timur	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2.196	2.196	2.587	2.604	2.666	2.717
Bali & Nusatenggara	3.505	3.808	3.887	4.014	4.072	4.056	4.091	4.254	4.370	4.473	4.557	4.632	4.456
61. Kalimantan Barat	2.208	2.379	2.568	2.708	2.576	2.462	2.559	2.560	2.570	2.632	2.673	2.725	2.726
62. Kalimantan Tengah	1.980	2.194	2.216	2.116	2.009	2.155	2.106	2.042	2.064	2.131	2.150	2.375	2.368
63. Kalimantan Selatan	2.594	2.568	2.548	2.576	2.694	2.722	2.724	2.735	2.841	2.811	2.825	2.904	2.984
64. Kalimantan Timur	2.093	2.333	2.522	2.425	2.322	2.360	2.435	2.508	2.505	2.645	2.697	2.748	2.772
Kalimantan	2.355	2.445	2.509	2.546	2.546	2.547	2.575	2.574	2.633	2.652	2.671	2.771	2.816
71. Sulawesi Utara	3.322	3.321	3.820	3.962	4.119	4.129	4.179	3.947	4.026	4.165	4.176	4.232	4.254
72. Sulawesi Tengah	2.414	2.551	2.817	2.948	2.936	2.988	3.011	3.124	3.202	3.254	3.298	3.308	3.343
73. Sulawesi Selatan	3.116	3.470	3.741	3.917	3.999	4.005	4.063	3.960	4.127	4.248	4.289	4.353	4.369
74. Sulawesi Tenggara	2.252	2.410	2.937	3.136	3.094	3.061	3.115	3.180	3.250	3.346	3.401	3.427	3.412
Sulawesi	3.045	3.350	3.630	3.796	3.883	3.899	3.932	3.838	3.981	4.097	4.127	4.161	4.186
81. Maluku	2.250	2.379	2.419	2.531	2.507	2.402	2.544	2.750	2.722	2.563	2.758	2.886	2.988
82. Irian Jaya	1.957	2.069	2.368	2.478	2.392	2.301	2.425	2.379	2.682	2.646	2.660	2.718	2.739
Maluku& Irian Jaya	2.041	2.158	2.383	2.501	2.434	2.341	2.500	2.622	2.696	2.626	2.693	2.776	2.759
Indonesia	3.578	3.783	4.036	4.169	4.214	4.229	4.246	4.326	4.413	4.527	4.575	4.629	4.634

Source: Agricultural Survey Production of Cereals in Indonesia, 1980-1991, CBS

Table 4.3 Historical Change in Production of Lowland Paddy by Province 1980-1991

unit: 000 ton

Province	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
11. D.I.Aceh	649.5	816.9	847.9	920.5	895.1	893.7	1,023.7	976.4	1,032.7	1,132.7	1,154.2	1,209.4	1,293.3
12. Sumatera Utara	1,406.5	1,497.4	1,661.9	1,641.8	1,843.1	1,977.9	1,913.3	2,152.1	2,318.1	2,369.8	2,478.5	2,584.7	2,715.3
13. Sumatera Barat	1,040.5	1,020.5	1,109.6	1,269.8	1,335.4	1,354.1	1,397.8	1,432.0	1,483.0	1,543.6	1,619.4	1,677.8	1,737.7
14. Riau	191.0	200.1	230.2	239.3	258.1	265.0	292.3	202.5	295.7	307.1	330.9	363.6	350.6
15. Jambi	368.3	374.1	398.7	410.8	418.7	437.7	414.7	421.8	447.1	439.9	475.2	455.2	501.0
16. Sumatera Selatan	705.2	799.4	812.9	918.9	921.6	977.5	1,078.7	1,066.3	1,110.6	1,145.8	1,203.2	1,062.6	1,300.3
17. Bengkulu	141.8	133.5	171.3	202.9	212.3	211.8	232.3	211.4	222.5	235.2	234.1	272.6	312.7
18. Lampung	502.8	596.4	666.6	745.8	836.7	823.8	883.9	1,002.5	995.5	1,034.0	1,110.2	1,088.6	1,354.7
Sumatera	5,005.5	5,438.3	5,899.2	6,349.7	6,721.0	6,941.3	7,236.8	7,465.0	7,905.2	8,208.2	8,605.7	8,714.5	9,565.6
31. D.K.I.Jakarta	61.4	52.2	48.8	32.9	34.7	37.6	41.3	38.4	38.6	39.2	39.2	27.5	31.4
32. Jawa Barat	6,411.9	7,098.1	7,255.7	7,524.9	8,196.3	8,701.0	8,788.0	8,973.0	9,202.2	9,925.2	10,024.6	9,529.5	10,406.3
33. Jawa Tengah	5,105.7	5,682.6	5,698.2	6,006.0	6,774.0	6,836.6	6,877.2	6,934.4	7,048.0	7,662.4	7,693.2	7,471.1	7,970.1
34. D.I.Yogyakarta	425.8	481.5	478.1	511.1	550.4	517.8	525.1	493.5	506.3	540.6	533.3	540.9	532.3
35. Jawa Timur	6,020.3	6,740.3	6,910.2	6,983.7	7,405.9	7,413.9	7,493.4	7,388.8	7,489.0	8,004.3	8,011.5	7,985.8	8,338.1
Jawa	18,025.1	20,054.8	20,391.2	21,058.7	22,961.3	23,506.9	23,725.0	23,828.1	24,284.2	26,171.7	26,301.7	25,554.8	27,278.3
51. Bali	717.2	739.4	728.2	733.1	753.0	758.5	771.5	804.0	790.1	871.4	848.4	818.3	836.1
52. Nusa Tenggara Barat	643.5	801.8	859.4	846.4	920.4	913.8	907.2	925.9	981.7	1,078.9	1,100.8	1,106.4	1,108.8
53. Nusa Tenggara Timur	121.1	141.1	178.9	198.8	178.9	183.0	192.7	166.6	185.5	204.3	210.8	247.9	249.5
54. Timor Timur	na	na	na	na	na	na	na	40.5	36.4	40.5	46.1	64.6	52.7
Bali & Nusatenggara	1,481.7	1,682.3	1,766.4	1,778.2	1,852.3	1,855.2	1,871.4	1,937.1	1,993.7	2,195.0	2,206.1	2,237.3	2,247.0
61. Kalimantan Barat	414.8	462.8	474.5	458.0	439.9	443.0	447.8	420.5	453.5	526.7	495.5	490.4	529.3
62. Kalimantan Tengah	142.8	160.1	164.0	159.7	151.6	163.7	163.4	164.4	168.3	187.1	216.6	211.5	222.7
63. Kalimantan Selatan	696.7	739.9	683.9	709.8	781.7	814.9	818.4	816.4	859.4	879.9	934.7	963.9	1,088.2
64. Kalimantan Timur	76.0	94.0	109.1	66.3	79.4	93.8	95.9	104.6	101.2	104.0	108.8	123.7	121.8
Kalimantan	1,330.3	1,456.7	1,431.5	1,393.8	1,452.6	1,515.4	1,525.6	1,505.9	1,582.4	1,697.8	1,755.5	1,789.5	1,962.2
71. Sulawesi Utara	185.3	166.7	229.8	249.1	243.2	258.3	304.0	301.6	280.6	298.5	318.3	347.6	285.7
72. Sulawesi Tengah	169.6	172.3	196.6	229.8	215.7	221.5	269.0	294.6	330.2	350.2	368.8	426.8	421.7
73. Sulawesi Selatan	1,760.0	1,980.3	1,820.0	2,175.3	2,499.2	2,656.8	2,707.6	2,534.2	2,811.0	3,277.1	3,109.9	3,073.4	3,437.6
74. Sulawesi Tenggara	31.9	33.6	36.1	53.4	66.4	65.3	87.6	90.6	99.8	135.1	135.7	146.3	187.2
Sumatera	2,146.8	2,352.9	2,282.5	2,707.6	3,024.4	3,201.8	3,368.2	3,221.0	3,521.5	4,060.9	3,932.7	3,994.1	4,332.2
81. Maluku	1.2	1.2	1.5	2.7	2.2	2.7	8.1	8.6	10.5	8.8	8.2	14.6	2.5
82. Irian Jaya	2.5	2.6	3.3	3.6	3.5	4.0	4.5	3.9	18.5	28.9	15.4	26.2	25.9
MALUKU & IRIAN JAYA	3.7	3.8	4.8	6.3	5.7	6.7	12.6	12.6	29.0	37.8	23.6	40.8	28.5
Indonesia	27,993.1	30,988.8	31,775.6	33,294.3	36,017.3	37,027.4	37,739.6	37,969.6	39,316.1	42,371.3	42,825.3	42,330.9	45,413.6

Source: Agricultural Survey Production of Cereals in Indonesia, 1980-1991, CBS