Table 2.23 Land Tenure Condition in the Study Area

(Unit: %)

Kab. Kec. Desa	Land Owner	Land Owner cum Tenant	Tenant
Kab. Sidrap			
Kec. Dua Pitue			
Tanru Tedong	50.4	23.2	26.4
Bila	63.0	21.4	15.6
Kab. Wajo			
Kec. Tanasitolo			
Nepo	37.0	21.8	41.2
Tancung	32.4	32.9	34.7
Lowa	53.8	17.3	28.9
Kec. Maniangpajo			
Anabanua	33.6	39.6	26.8
Kalola	42.9	22.6	34.5
Kec. Belawa			
Wele	45.8	30.5	23.7
Belawa	48.8	28.3	22.9
Average	48.1	26.1	25.8

Source: Census and Statistics offices and IPEDA offices, Kab. Sidrap and Wajo

Kec. and Desa offices in the Study Area

Table 2.24 Land Holding Size Distribution in the Study Area

(Unit: Nos. of farm)

Kab. Kec. Desa	Land Holding Size (ha)						Total
	0-0.5	0.5-1.0	1.0-1.5	1.5-2.0	2.0-5.0	5.0-	
Kab. Sidrap							
Kec. Dua Pitue							
Tanru Tedong	875	378	330	39	21	15	1,658
Bila	484	234	170	140	20	19	1,076
Kab. Wajo							
Kec. Tanasitolo							
Nepo	249	134	118	119	86	16	722
Tancung	392	335	227	116	30	39	1,139
Lowa	335	188	134	40	23	8	728
Kec. Maniangpajo							
Anabanua	308	221	133	77	83	12	834
Kalola	-	10	111	235	11	7	374
Kec. Belawa							
Wele	244	498	59	32	27	14	874
Belawa	701	316	76	40	33	23	1,189
Total	3,588	2,314	1,358	847	334	153	8,594
%	41.7	26.9	15.8	9.9	3.9	1.8	100

Source: Census and Statistics offices and IPEDA offices, Kab. Sidrap and Wajo

Kec. and Desa offices in the Study Area

Table 2.25 Average Farm Size in the Study Area

(Unit: ha)

Kab. Kec. Desa	Total Area	Farm Land			Total Farm Household (Nos.)	Average Farm Size per Household		
		Paddy Field	Upland/ Orchard Field	Total		Paddy Field	Upland/ Orchard Field	Total
Kab. Sidrap								
Kec. Dua Pitue								
Tanru Tedong	3,500	2,610	190	2,800	2,127	1.23	0.09	1.32
Bila	10,200	3,070	480	3,550	1,570	1.95	0.30	2.25
Kab. Wajo								
Kec. Tanasitolo								
Nepo	2,800	290	200	490	1,153	0.25	0.17	0.42
Tancung	3,300	630	570	1,200	1,638	0.38	0.35	0.73
Lowa	4,800	1,660	320	1,980	962	1.72	0.33	2.05
Kec. Maniangpajo								
Anabanua	5,600	2,260	230	2,490	1,070	2.11	0.21	2.32
Kalola	7,700	1,930	330	2,260	537	3.59	0.61	4.20
Kec. Belawa								
Wele	3,400	1,920	160	2,080	1,076	1.78	0.15	1.93
Belawa	3,100	560	380	940	1,449	0.39	0.26	0.65
Total/Average	44,400	14,930	2,860	17,770	11,582	1.29	0.25	1.54

Source: Agriculture offices, census and statistics offices in Kab. Siding and Wajo Desa offices in and around the study area.

Remark: The figures include the data in and around the study area.

Table 2.26 Results of Farm Economy Survey on the Living Expenses of Farmer

(Unit: Rp./Year/Farmer)

Kab. Kec. Desa	No. of Sampling Farmers (Nos.)	Average Family Size (Persons)	Food	Clothing	Residence	Luxury	Education	Social	Others	Total
Kab. Sidrap										
Kec. Dua Pitue										
Tanru Tedong	5	6.6	226,250	38,730	53,400	13,450	18,750	33,840	23,240	407,660
Bila	6	5.7	157,480	22,360	11,360	6,830	14,120	14,590	8,650	235,390
Kab. Wajo										
Kec. Tanasitolo										
Nepo	5	5.0	240,110	52,180	42,940	38,790	10,620	43,870	33,240	461,750
Tancung	5	4.8	160,780	23,210	24,050	15,380	8,670	32,430	15,090	279,610
Lowa	5	5.0	185,850	25,700	46,810	13,020	12,320	56,320	11,970	351,990
Kec. Manianapajo										
Anabanua	5	5.4	234,150	38,010	26,290	39,230	15,370	22,240	29,120	404,410
Kalola	5	6.0	249,930	21,880	59,320	49,600	19,940	57,380	28,190	486,240
Kec. Belawa										
Wele	5	5.0	167,070	35,640	23,090	30,500	10,550	7,980	10,270	285,100
Belawa	5	5.0	174,380	40,150	39,550	24,780	12,860	8,470	13,450	313,640
Average	(46)	5.5	199,560	33,100	36,310	25,730	13,690	30,790	19,240	358,420
(%)	-	-	55.7	9.2	10.1	7.2	3.8	8.6	5.4	100.0

Table 2.27 Farm Budget of Average Size Farmer under Present Condition

Total Farm Land: 1.54 ha
Paddy Field : 1.29 ha
Up-land Field: 0.25 ha
Family Size : 5.5 persons

(Unit: Rp.)

Description	Amount
1. Gross Income	
Farm income	
Wet season paddy	264,860
Dry season paddy	16,480
Polowijo crops	57,090
Up-land crops	41,910
Non-farm income	47,390
Sub-total	427,730
2. Gross Out-go	
Farming expenses	
Wet season paddy	45,150
Dry season paddy	2,290
Polowijo crops	8,090
Up-land crops	5,890
IPEDA tax, others	7,370
Sub-total	68,790
3. Net Income	
(1 - 2)	358,940
4. Family Living Expenses	
Food	199,560
Clothing	33,100
Residence	36,310
Luxury	25,730
Education	13,690
Social	30,790
Others	19,240
Sub-total	358,420
Net Reserve (3 - 4)	520

Remark: Family living expenses is estimated based upon the farm economy survey and shown in Table 2.26.

Table 3.1 Present Condition of Agricultural Support Service in the Study Area (1980)

Kab. Kec. Desa	Village Unit	BUUD/KUD	Member	KIOSK	Wear-house	Rice mill	PPL
Kab. Sidrap							
Kec. Dua Pitue							
Tanru Tedong	Tanru Tedong I Tanru Tedong II Tanru Tedong III	Amanah	403	1	1	1	3
Bila	Bila I Bila II Bila III	Matutu	105	1	1	1	2
Kab. Wajo							
Kec. Tanasitolo							
Nepo	Nepo	Latenritata	120	-	2	1	2
Tancung	Tancung						1
Lowa	Lowa	Lowa	306	-	1	1	1
Kec. Maniangpajo							
Anabanua	Anabanua I Anabanua II	Anabanua	626	1	2	2	2
Kalola	Kalola III						
Kec. Belawa							
Welo	Welo	Belawa II	285	1	2	2	-
Belawa	Belawa	Belawa I	320	1	1	1	1
Total	14	7	2,165	5	10	9	13

Source: Cooperative offices and Agriculture offices, Kab. Sidrap and Wajo.

Remark: The figures include the data in and around the study area.

Table 3.2 Area under BIMAS and INMAS Program in the Study Area

(Unit: ha)

Kab. Kec. Desa	BIMAS Program			INMAS Program		
	1978/1979	1979/1980	1980/1981	1978/1979	1979/1980	1980/1981
Kab. Sidrap						
Kec. Dua Pitue						
Tanru Tedong	229	284	671	+	247	2,014
Bila	+	+	419	+	+	2,494
Kab. Wajo						
Kec. Tanasitolo						
Nepo	+	+	+	+	+	70
Tancung	21	26	31	221	242	125
Lowa	26	18	16	123	132	250
Kec. Maniangpajo						
Anabanua	34	43	64	572	1,023	1,021
Kalola	+	26	21	384	633	821
Kec. Belawa						
Wele	33	56	36	376	427	623
Belawa	51	256	23	421	362	321
Total	394	709	1,280	2,097	3,066	7,739

Source : BRI branch offices, Kab. Sidrap and Wajo

Remarks: 1) +; No data are available.
2) The figures include the data in and around the study area.

Table 3.3 Amount of BIMAS Package Credit per Ha
(Paddy, 1981/1982)

(Unit: Rp.)

1981/1982	Category - I						Category - II					
	Package A		Package B		Package C		Package A		Package B		Package C	
	Amount	Value	Amount	Value	Amount	Value	Amount	Value	Amount	Value	Amount	Value
1. Seed	-	5,000	-	-	-	5,000	-	5,000	-	-	-	5,000
2. Fertilizers												
Urea	200 kg	14,000	100 kg	7,000	250 kg	17,500	130 kg	9,100	65 kg	4,550	160 kg	11,200
T.S.P./1	50 kg	3,500	35 kg	2,450	75 kg	5,250	50 kg	3,500	35 kg	2,450	75 kg	5,250
D.A.P./2	-	-	-	-	-	-	150 kg	9,750	75 kg	4,875	185 kg	12,025
KCl/K_2O/3	50 kg	3,500	50 kg	3,500	50 kg	3,500	50 kg	3,500	50 kg	3,500	50 kg	3,500
3. Agro-chemicals												
Insecticide	2 lit	2,460	2 lit	2,460	2 lit	2,460	2 lit	2,460	2 lit	2,460	2 lit	2,460
Rodenticide	0.2 kg	1,000	0.2 kg	1,000	0.2 kg	1,000	0.2 kg	1,000	0.2 kg	1,000	0.2 kg	1,000
4. Sprayer	-	2,000	-	2,000	-	2,000	-	2,000	-	2,000	-	2,000
5. Other Expenses	-	10,000	-	10,000	-	10,000	-	10,000	-	10,000	-	10,000
Total	-	41,460	-	28,410	-	46,710	-	46,310	-	30,835	-	52,435

Source : Report of Intensification Programme of Paddy, Polowijo, and Vegetable, 1981/1982, 1981, South Sulawesi Province.

B.P.P. in Kab. Sidrap and Wajo, 1981.

Remarks: /1; T.S.P., Triple super phosphate
/2; D.A.P., Diammonium phosphate
/3; Kcl, Potassium chloride

Table 3.4 Amount of BIMAS Package Credit per Ha
(Polowijo Crops, 1981/1982)

(Unit: Rp.)

1981/1982	Maize		Groundnuts		Greenbeans		Soybeans	
	Amount	Value	Amount	Value	Amount	Value	Amount	Value
1. Seed	-	3,250	-	35,000	-	8,000	-	15,000
2. Fertilizers								
Urea	250 kg	17,500	100 kg	7,000	100 kg	7,000	75 kg	5,250
T.S.P.	100 kg	7,000	100 kg	7,000	100 kg	7,000	100 kg	7,000
3. Chemicals								
Insecticide	2 lit	2,460	2 lit	2,460	2 lit	2,460	2 lit	2,460
Fungicide	-	-	-	-	-	-	-	-
Rodenticide	-	-	-	-	-	-	-	-
4. Sprayer	-	-	-	1,000	-	1,000	-	1,000
5. Other Expenses	-	4,000	-	4,000	-	4,000	-	4,000
Total	-	32,365	-	56,460	-	29,460	-	34,710

Source: Report of Intensification Programme of Paddy, Polowijo, and Vegetable, 1981/1982, 1981, South Sulawesi Province.

B.P.P. in Kab. Sidrap and Wajo, 1981.

Table 5.1 Comparison of Alternative Cropping Pattern in Profitability per ha

(Unit: 10^3Rp.)

Description	Pattern A	Pattern B	Pattern C	Pattern D	Pattern E
1. Planted Area (ha)	2.00	2.00	2.50	2.50	3.00
1st Wet season paddy	1.00	1.00	0.50	0.50	1.00
1st Dry season paddy	1.00	1.00	0.50	0.50	1.00
2nd Wet season paddy	-	-	0.50	0.50	-
2nd Dry season paddy	-	-	0.50	-	-
1st Polowijo crops	-	-	0.50	0.50	1.00
2nd Polowijo crops	-	-	-	0.50	-
2. Gross Production Value /1	2,000.0	2,000.0	2,165.0	1,830.0	2,330.0
Wet season paddy	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0
Dry season paddy	1,000.0	1,000.0	1,000.0	500.0	1,000.0
Polowijo crops	-	-	165.0	330.0	330.0
3. Production Cost /2	599.2	599.2	682.2	612.7	765.1
Wet season paddy	294.5	294.5	294.5	294.5	294.5
Dry season paddy	304.7	304.7	304.7	152.3	304.7
Polowijo crops	-	-	83.0	165.9	165.9
4. Net Production Value (2) - (3)	1,400.8	1,400.8	1,482.8	1,217.3	1,565.9
Wet season paddy	705.5	705.5	705.5	705.5	705.5
Dry season paddy	695.3	695.3	695.3	347.7	695.3
Polowijo crops	-	-	82.0	164.1	164.1

Remarks: /1; Planted area x unit yield (ton/ha) x unit price (Rp./ton)

Unit yield: W.S.P. 5 tons/ha
D.S.P. 5 tons/ha
Polowijo 1.2 tons/ha

Unit prices; Dried paddy Rp. 200,000/ton
Polowijo crops Rp. 275,000/ton

/2; Tables 5.11, 5.12 and 5.13, to be referred.

Table 5.2 Calculation of Available Labour Force under the Project

Total Paddy Fields/1 (1) (ha)	Irrigated Paddy Fields under the Project (2) (ha)	Remaining Rainfed Paddy Fields (3) = (1) - (2) (ha)	Unit Average Labour Requirement for Rainfed Paddy Fields/2 (4) (man/ha/day)	Total Labour Requirement for Rainfed Paddy Fields (5) = (3) x (4)	Total Available Labour Force/3 (6) (man/ha/day)	Unit Available Labour Force per ha for Irrigated Paddy Field the Project (7) = [(6) - (5)]/(2) (man/ha/day)
13,700	5,000	8,700	1.12	9,740	23,500	2.75
13,700	6,000	7,700	1.12	8,620	23,500	2.48
13,700	7,000	6,700	1.12	7,500	23,500	2.28
13,700	8,000	5,700	1.12	6,380	23,500	2.14
13,700	9,000	4,700	1.12	5,260	23,500	2.02
13,700	10,000	3,700	1.12	4,140	23,500	1.93

Remarks: /1: See Table 2.4

/2: Estimated on the basis of farm economy survey. The labour requirement for domestic purposes are included.

/3: Total available labour force = (a) x (b) x (c)/100

(a) Total farm household/1 : 11,582

(b) Average family size/1 : 5.5

(c) Percentage of available labour force (15 - 49 years old)

Male/4	19.4 x 0.9/5	= 17.4
Female/4	26.1 x 0.75/5	= 19.5
Total		36.9

/4: See Table 2.3

/5: Adult men equivalent

Table 5.3 Farm Inputs and Labour Requirements per Ha under Proposed Farming Practices for Paddy Cultivation

(Unit: man-day)

	Farm Operation	Days after Trans-planting	Farm Inputs		Labour Requirement Wet Season Paddy	Labour Requirement Dry Season Paddy
1.	Nursery preparation /1 (seeding, raising of seedling)	- 20	Seed Urea	30 kg 5 kg	4.3	4.5
2.	Field preparation (plowing)	- 10			11.3	12.8
3.	Field preparation (harrowing/puddling)	- 5	Urea T.S.P.	65 kg 50 kg	13.6	15.0
4.	1st fertilizer application	- 5	KCl	50 kg	2.5	2.5
5.	Transplanting /2	0			25.7	25.7
6.	1st weeding	+ 10			4.5	5.8
7.	2nd fertilizer application	+ 10	Urea	65 kg	1.5	1.5
8.	1st chemical application	+ 10	Insecticide	1 lit.	1.3	1.3
9.	2nd weeding	+ 15			4.5	5.8
10.	3rd weeding	+ 25			3.1	4.1
11.	2nd chemical application	+ 25	Insecticide	1 lit.	1.3	1.3
12.	3rd fertilizer application	+ 30	Urea	65 kg	1.5	1.5
13.	3rd chemical application	+ 50	Fungicide	1 lit.	1.3	1.3
14.	4th chemical application	+ 70	Insecticide Rodenticide	1 lit. 100 gr	1.8	1.8
15.	Harvesting	+ 90			22.9	22.9
16.	Thresing				18.2	18.2
17.	Drying				5.6	5.6
18.	Transportation				12.8	12.8
19.	Water management				5.0	5.0
	Total				142.7	149.4

Remarks: /1; Area of nursery bed: 1/20 of paddy field /2; Planting density; 30 cm x 15 cm, 3 seedling/hill
Planting depth ; 3 cm from the surface

This table compiled on the basis of data obtained from Central Research Institute for agriculature, Bogor and Agriculture Offices in Kab. Wajo and Sidrap.

Table 5.4 Annual Incremental Production of Paddy and Polowijo Crops under with and without Project

Description	W/O Project	W/Project	Increment
1. Total Paddy Field (ha)/1	10,300	9,800	- 500
2. Planted/Harvested Area (ha)/2	12,800	19,600	6,800
Wet season paddy	9,490	9,800	310
Dry season paddy	590	9,800	9,210
Polowijo crops	2,720	-	- 2,720
3. Unit Yield (tons/ha)			
Wet season paddy	2.97	5.00	2.03
Dry season paddy	2.84	5.00	2.16
Polowijo crops	0.73	-	
4. Production (tons)	29,870	98,000	68,130
Wet season paddy/3	28,190	49,000	20,810
Dry season paddy/3	1,680	49,000	47,320
Polowijo crops	(1,990)	(-)	(- 1,990)

Remarks: /1; The difference between with and without project conditions means losses of farmland for project facilities, i.e., the areas of the existing paddy fields which will become unproductive owing to the construction of the project facilities.

/2; The planted/harvested areas under without project condition area determined by applying the rate of the present drought damage area to the total paddy field area.

/3; Dried paddy

Table 5.5 Projected Financial Prices of Paddy and Polowijo Crops

Paddy

(Unit: Rp./Kg)

Year	Milled Rice			Dried Paddy		
	Wajo	Sidrap	Sul-Sel	Wajo	Sidrap	Sul-Sel
1975	90.16	77.18	93.95	61.31	52.48	63.89
1976	107.15	95.79	112.54	72.86	65.14	76.53
1977	105.73	98.27	115.25	71.90	66.82	78.37
1978	130.33	117.67	128.88	88.62	80.02	87.64
1979	139.48	144.96	164.50	94.85	98.57	111.86
1980	179.69	173.00	207.77	122.19	117.64	141.28
1981						
1. Projected Retail Price	182.35	182.41	211.01	124.00	124.04	143.48
2. Farm Gate Price (1 x 0.75)/1	136.76	136.81	158.26	93.00	93.03	107.61

Polowijo Crops/1

(Unit: Rp./Kg)

Year	Maize	Groundnuts	Greenbeans	Soybeans
1975	47.45	182.25	165.80	138.61
1976	69.24	230.63	233.23	174.50
1977	47.11	239.88	209.82	145.88
1978	46.79	254.38	200.21	-
1979	76.26	412.23	355.38	225.00
1980	87.53	537.50	289.27	-
1981				
1. Projected Retail Price	88.89	591.79	350.06	263.71
2. Farm Gate Price (1 x 0.75)/2	66.67	443.84	262.55	197.78

Source : Statistik Harga Hasil Pertanian Taraman Pangan, 1981.

Remarks: /1; The average price in Kab. Wajo and Sidrap.

/2; The ratio of retail price and farm gate price is obtained through farm economy survey.

Table 5.6 Financial Prices of Farm Products and Farm Inputs at Farm Gate (as of 1981)

(Unit: Rp./Kg, lit)

Description			Prices
1. Farm Products			
	Dried paddy		93
	Maize		67
	Groundnuts		444
	Greenbeans		263
	Soybeans		198
2. Farm Inputs			
	Seed	Paddy	160
		Maize	95
		Groundnuts	450
		Greenbeans	320
		Soybeans	300
	Fertilizers	Urea	75
		T.S.P.	75
		KCl	75
	Agro-chemicals	Insecticide	1,310
		Fungicide	1,310
		Rodenticide	4,260
	Labour	Heavy worker	1,070
		Light worker	800
		Female worker	530

Remark: Financial prices in 1981 are estirated by applying 6.6% per annum as the price escalation index to present prices in 1980 (refer to Tables 2.17 and 5.5.).

Table 5.7 Economic Prices of Farm Products and Farm Inputs at Farm Gate (1990)

(Unit: Rp./Kg, lit)

Description			Price
1. Farm Products			
	Dried paddy		200
	Maize		113
	Groundnuts		357
	Greenbeans		340
	Soybeans		286
2. Farm Inputs			
	Seed	Paddy	300
		Maize	140
		Groundnuts	380
		Soybeans	320
	Fertilizers	Urea	260
		T.S.P.	220
		KCl	100
	Agro-chemicals	Insecticide	6,500
		Fungicide	6,500
		Rodenticide	2,300
	Labour	Heavy worker	1,300
		Light worker	1,000
		Female worker	660

Source: Calculated from the data given in "Price Prospects for Major Primary Commodities", IBRD, June 1991.

Remark: Labour value increase is assumed by annual increase rate of 2.5% considering the regional socio-economic development in future.

Table 5.8 Calculation of 1990 Economic Farm Gate Price of Paddy
(Import Substitution Price)

(Unit: Rp./ton)

1.	International Market Price of Milled Rice (F.O.B. Bangkok, Thai 5% broken), US$613	383,125
2.	Quality Discount at 20%	306,500
3.	External Transportation Cost (Bangkok - Ujung Pandang)	+ 23,400
4.	Port Handling Charge and Storing Cost (including Cost of sack)	+ 14,260
5.	Price of Milled Rice at Ex-DOLOG (Ujung Pandang)	344,160
6.	Inland Transportation Cost (Ujung Pandang - Sengkang)	- 17,500
7.	Milling Charge	- 9,600
8.	Local Storage Loss (5%)	- 16,900
9.	Price of Milled Rice at Ex-mill Gate (Sengkang)	300,160
10.	Conversion to Price of Dry Paddy (x 0.68)	204,100
11.	Handling and Transportation Cost (farm gate to mill)	- 3,900
12.	Economic Farm Gate Price of Dried Paddy	200,200
		(≒ 200,000)

Source: Price Prospects for Major Primary Commodities, IBPD, 1981
(US$613, Projected price to 1990 at 1981 constant price)

Remark: All the data for 1981 were obtained from DOLOG, Sulawesi Selatan and were projected to 1990 by using the general price index in Sulawesi Selatan.
(Conversion rate; US$1 = Rp.625)

Table 5.9 Calculation of 1990 Economic Farm Gate Price of Polowijo Crops (Import substitution price)

(Unit: Rp./ton)

	Description	Maize		Groundnuts		Greenbeans		Soybeans	
1.	International Market Prices/1	US$162	101,250	US$561	350,625	US$532	332,500	US$441	275,625
2.	External Transportation Cost (to Ujung Pandang)		+ 25,600		+ 25,600		+ 25,600		+ 25,600
3.	Port Handling Charge and Storing Cost		+ 11,700		+ 11,700		+ 11,700		+ 11,700
4.	Market Prices at Ujung Pandang		138,550		387,925		369,800		312,925
5.	Inland Transportation Cost (Ujung Pandang - Sengkang)		- 8,000		- 8,000		- 8,000		- 8,000
6.	Marketing Cost, Sengkang/2		- 17,100		- 22,900		- 22,000		- 19,150
7.	Economic Farm Gate Prices		113,450		357,025		339,800		285,775

Source: Price Prospects for Major Primary Commodities, IBRD, 1981
(1990 Projection in 1981 constant price)

Remark: All the data for 1981 were obtained from DOLDG, Sulawesi Selatan and were projected to 1990 by using the general price index in Sulawesi Selatan.

/1: Conversion rate US$1 = RP.625

/2: Including cost of marketing, storing, handling and transportation from farm.

Table 5.10 Calculation of 1990 Economic Farm Gate Price of Farm Inputs (Import substitution price)

(Unit: Rp./ton)

Description	Price
1. Fertilizer	
(1) Urea	
Export price F.O.B. Europe US$301/1	188,125
External transportation cost to Ujung Pandang	25,000
Port handling charge and storing cost	12,500
Inland distribution cost/2	34,300
Economic farm gate price, Sengkang	259,925
	(≒ Rp.260/kg)
(2) Triple Super Phosphate	
Export price F.O.B. Gulf US$245/1	153,125
External transportation cost to Ujung Pandang	20,625
Port handling charge and storing cost	12,500
Inland distribution cost/2	33,700
Economic farm gate price, Sengkang	219,950
	(≒ Rp.220/kg)
(3) Muriate of Potash	
Export price F.O.B. Vancouver US$78/1	48,750
External transportation cost to Ujung Pandang	15,625
Port handling charge and storing cost	12,500
Inland distribution cost/2	23,500
Economic farm gate price, Sengkang	100,375
	(≒ Rp.100/kg)
2. Agro-chemicals	
(1) Insecticide, Fungicide	
Adjusted to 1981 prices	6,460,000
	(≒ Rp.6,500/lit)
(2) Rodenticide	
Adjusted to 1981 prices	2,300,000
	(= Rp.2,300/kg)

Source: Price Prospects for Major Primary Commodities, IBRD, 1981

Remark: All the date were projected to 1990 by using the general price index in Sulawesi Selatan.

/1: Conversion rate US$1 = Rp.625

/2: Including cost of storing, handling and transportation to KIOS.

Table 5.11 Production Cost of Paddy with and without Project

(Unit: Rp.)

Description	Unit Price	Without Project				With Project			
		Wet Season Paddy		Dry Season Paddy		Wet Season Paddy		Dry Season Paddy	
1. Farm Input									
(1) Seed	Rp. 300/kg	35 kg	10,500	35 kg	10,500	30 kg	9,000	30 kg	9,000
(2) Fertilizers									
Urea	Rp. 260/kg	100 kg	26,000	100 kg	26,000	200 kg	52,000	200 kg	52,000
T.S.P.	Rp. 220/kg	50 kg	11,000	-	-	50 kg	11,000	50 kg	11,000
KCl	Rp. 100/kg	-	-	-	-	50 kg	5,000	50 kg	5,000
(3) Agro-chemicals									
Insecticide	Rp. 6,500/lit	2 lit	13,000	1 lit	6,500	3 lit	19,500	3 lit	19,500
Fungicide	Rp. 6,500/lit	-	-	-	-	1 lit	6,500	1 lit	6,500
Rodenticide	Rp. 2,300/kg	0.1 kg	230	-	-	0.1 kg	230	0.1 kg	230
Sub-total			60,730		43,000		103,230		103,230
2. Labour Cost	(Rp./day)	(M/D)		(M/D)		(M/D)		(M/D)	
(1) Nursery Preparation	1,300	4.7	6,100	4.7	6,100	4.3	5,590	4.5	5,800
(2) Plowing	1,450	11.3	16,380	12.3	17,830	11.3	16,380	12.8	18,560
(3) Harrowing/Puddling	1,450	13.6	19,720	14.5	21,030	13.6	19,720	15.0	21,750
(4) Transplanting	1,300	25.7	33,410	25.7	33,410	25.7	33,410	25.7	33,410
(5) Weeding	1,300	11.9	15,470	14.5	18,850	12.1	15,730	15.7	20,410
(6) Fertilizer Application	600	3.0	1,800	2.0	1,200	5.5	3,300	5.5	3,330
(7) Chemical Application	1,300	3.0	3,900	2.0	2,600	5.7	7,410	5.7	7,410
(8) Harvesting	1,000	18.0	18,000	17.0	17,000	22.9	22,900	22.9	22,900
(9) Threshing	1,000	14.0	14,000	12.3	12,300	18.2	18,200	18.2	18,200
(10) Drying	1,000	4.0	4,000	3.6	3,600	5.6	5,600	5.6	5,600
(11) Transportation	660	9.2	6,070	8.0	5,280	12.8	8,450	12.8	8,450
(12) Water Management	600	1.5	900	2.0	1,200	5.0	3,000	5.0	3,000
Sub-total		119.9	139,750	118.6	140,400	142.7	159,690	149.4	168,790
3. Miscellaneous Cost (Equipment, tax etc.)	12% of (1 + 2)		24,060		22,010		31,550		32,600
Total (1 + 2 + 3)			224,540		205,410		294,470		304,660

Table 5.12 Production Cost of Polowijo Crops with Project

(Unit: Rp.)

Description	Unit Price	Maize		Groundnuts		Greenbeans		Soybeans	
1. Farm Input									
(1) Seed		50 kg	7,000	100 kg	39,000	25 kg	9,500	40 kg	12,800
(2) Fertilizers									
Urea	Rp. 260/kg	150 kg	39,000	100 kg	26,000	100 kg	26,000	75 kg	19,500
T.S.P.	Rp. 220/kg	100 kg	22,000	100 kg	22,000	100 kg	22,000	100 kg	22,000
(3) Agro-chemicals									
Insecticide	Rp. 6,500/lit	2 lit	13,000	2 lit	13,000	2 lit	13,000	2 lit	13,000
Rodenticide	Rp. 2,300/kg	0.1 kg	230	0.1 kg	230	0.1 kg	230	0.1 kg	230
Sub-Total			81,230		100,230		70,730		67,530
2. Labour Cost	(Rp./day)	(M/D)		(M/D)		(M/D)		(M/D)	
(1) Land Preparation	1,300	10	13,000	10	13,000	10	13,000	10	13,000
(2) Seeding	1,000	8	8,000	10	10,000	15	15,000	14	14,000
(3) Weeding	1,000	20	20,000	20	20,000	20	20,000	20	20,000
(4) Fertilizer Application	600	3	1,800	2	1,200	2	1,200	2	1,200
(5) Chemical Application	1,300	3	3,900	3	3,900	3	3,900	3	3,900
(6) Harvesting/Drying	660	15	9,900	30	19,800	25	16,500	25	16,500
(7) Transportation	660	4	2,640	3	1,980	3	1,980	3	1,980
(8) Water Management	600	3	1,800	3	1,800	3	1,800	3	1,800
Sub-Total		66	61,040	81	71,680	86	78,380	80	72,380
3. Miscellaneous Cost (Equipment, tax etc.)	10% of (1 + 2)		14,230		17,190		14,990		13,990
Total (1 + 2 + 3)			156,500		189,100		164,100		153,900

Table 5.13 Production Cost of Polowijo Crops without Project

(Unit: Rp.)

Description	Unit Price	Maize		Groundnuts		Greenbeans		Soybeans	
1. Farm Input									
(1) Speed		20 kg	2,800	65 kg	25,350	25 kg	9,500	30 kg	9,600
(2) Fertilizers									
Urea	Rp. 260/kg	-	-	50 kg	13,000	50 kg	13,000	-	-
T.S.P.	Rp. 220/kg	-	-	-	-	-	-	-	-
(3) Agro-chemicals									
Insecticide	Rp. 6,500/lit	-	-	2 lit	13,000	2 lit	13,000	2 lit	13,000
Sub-total			2,800		51,350		35,500		22,600
2. Labour Cost	(Rp./day)	(M/D)		(M/D)		(M/D)		(M/D)	
(1) Land Preparation	1,300	6	7,800	8	10,400	7	9,100	8	10,400
(2) Seeding	1,000	4	4,000	6	6,000	10	10,000	6	6,000
(3) Weeding	1,000	14	14,000	20	20,000	20	20,000	20	20,000
(4) Fertilizer Application	600	-	-	1	600	1	600	-	-
(5) Chemical Applilication	1,300	-	-	4	5,200	4	5,200	4	5,200
(6) Harvesting/Drying	660	14	9,200	24	15,840	22	14,520	22	14,520
(7) Transportation	660	3	1,980	3	1,980	2.5	1,650	2.5	1,650
(8) Water Management	600	1	600	1	600	1	600	1	600
Sub-total		42	37,580	63	60,620	67.5	61,670	59.5	58,370
3. Miscellaneous Cost (Equipment, tax etc.)	10% of (1 + 2)		4,040		11,200		9,730		8,030
Total (1 + 2 + 3)			44,420		123,170		106,900		89,000

Table 5.14 Annual Net Production Value per Ha under Future with and without Project

Description	Without Project	With Project	Increment
1. Planted/Harvested Area (ha)			
Wet season paddy	0.921	1.00	0.079
Dry season paddy	0.057	1.00	0.943
Polowijo crops	0.264	-	- 0.264
2. Unit Yield (tons/ha)			
Wet season paddy	2.97	5.00	2.03
Dry season paddy	2.84	5.00	2.16
Polowijo crops	0.73	-	-
3. Unit Prices (Rp./ton)			
Dry paddy	200,000	200,000	-
Polowijo crops	275,000	275,000	-
4. Unit Production Cost (Rp./ha)			
Wet season paddy	224,540	294,470	69,930
Dry season paddy	205,410	304,660	99,250
Polowijo crops	90,870	-	-
5. Gross Production Value (Rp./ha)	632,450	2,000,000	1,367,550
Wet season paddy	547,070	1,000,000	452,930
Dry season paddy	32,380	1,000,000	967,620
Polowijo crops	53,000	-	- 53,000
6. Production Cost (Rp./ha)	242,500	599,130	356,630
Wet season paddy	206,800	294,470	87,670
Dry season paddy	11,710	304,660	292,950
Polowijo crops	23,990	-	- 23,990
7. Net Production Value (Rp./ha)	389,950	1,400,870	1,010,920
Wet season paddy	340,270	705,530	365,260
Dry season paddy	20,670	695,340	674,670
Polowijo crops	29,010	-	- 29,010
8. Annual Net Production Value per Ha (Rp.)	389,950	1,400,870	1,010,920
	(US$624)	(US$2,241)	(US$1,617)

Table 6.1 Irrigation Benefits

Description		Without Project	With Project	Increment
1. Project Area	(ha)	10,900	9,800	-1,100
2. Planted/Harvested Area	(ha)			
Wet season paddy		9,490	9,800	310
Dry season paddy		590	9,800	9,210
Polowijo crops		2,720	-	-2,720
3. Gross Production Value	(10^6 Rp.)	6,518	19,600	13,082
Wet season paddy		5,637	9,800	4,163
Dry season paddy		335	9,800	9,465
Polowijo crops		546	-	-546
4. Total Production Cost	(10^6 Rp.)	2,499	5,872	3,373
Wet season paddy		2,131	2,886	755
Dry season paddy		121	2,986	2,865
Polowijo crops		247	-	-247
5. Net Production Value	(10^6 Rp.)	4,019	13,728	9,709
Wet season paddy		3,506	6,914	3,408
Dry season paddy		214	6,814	6,600
Polowijo crops		299	-	-299
6. Production Loss Value	(10^6 Rp.)	157	-	-157
Wet season paddy		136	-	-136
Dry season paddy		8	-	-8
Polowijo crops		13	-	-13
7. Annual Incremental Benefits	(10^6 Rp.)	4,176	13,728	9,552 (US$1,560/ha)

Table 6.2 Farm Budget of Average Size Farmer under with and without Project

Total Farm Land: 1.54 ha
Paddy field : 1.29 ha/1
Up-land field: 0.25 ha
Family Size : 5.5 persons

Description	W/o Project	W/Project	Increment
1. Gross Income			
Farm income			
Wet season paddy	328,160	521,920	
Dry season paddy	19,560	433,410	
Polowijo crops	58,850	16,880	
Up-land crops	43,200	43,200	
Non-farm income	54,980	-	
Sub-total	504,750	1,015,410	510,660
2. Gross Out-go			
Farming expenses			
Wet season paddy	48,150	87,490	
Dry season paddy	2,440	71,760	
Polowijo crops	8,630	2,480	
Up-land crops	6,280	6,280	
IPEDA tax, others	7,560	18,290	
Family living expenses	430,500	526,300	
Sub-total	503,560	712,600	209,040
3. Net Reserve (1 - 2)	1,190	302,810	301,620

Remark: /1; Out of 1.29 ha of paddy field, 0.92 ha will be put under the project area.

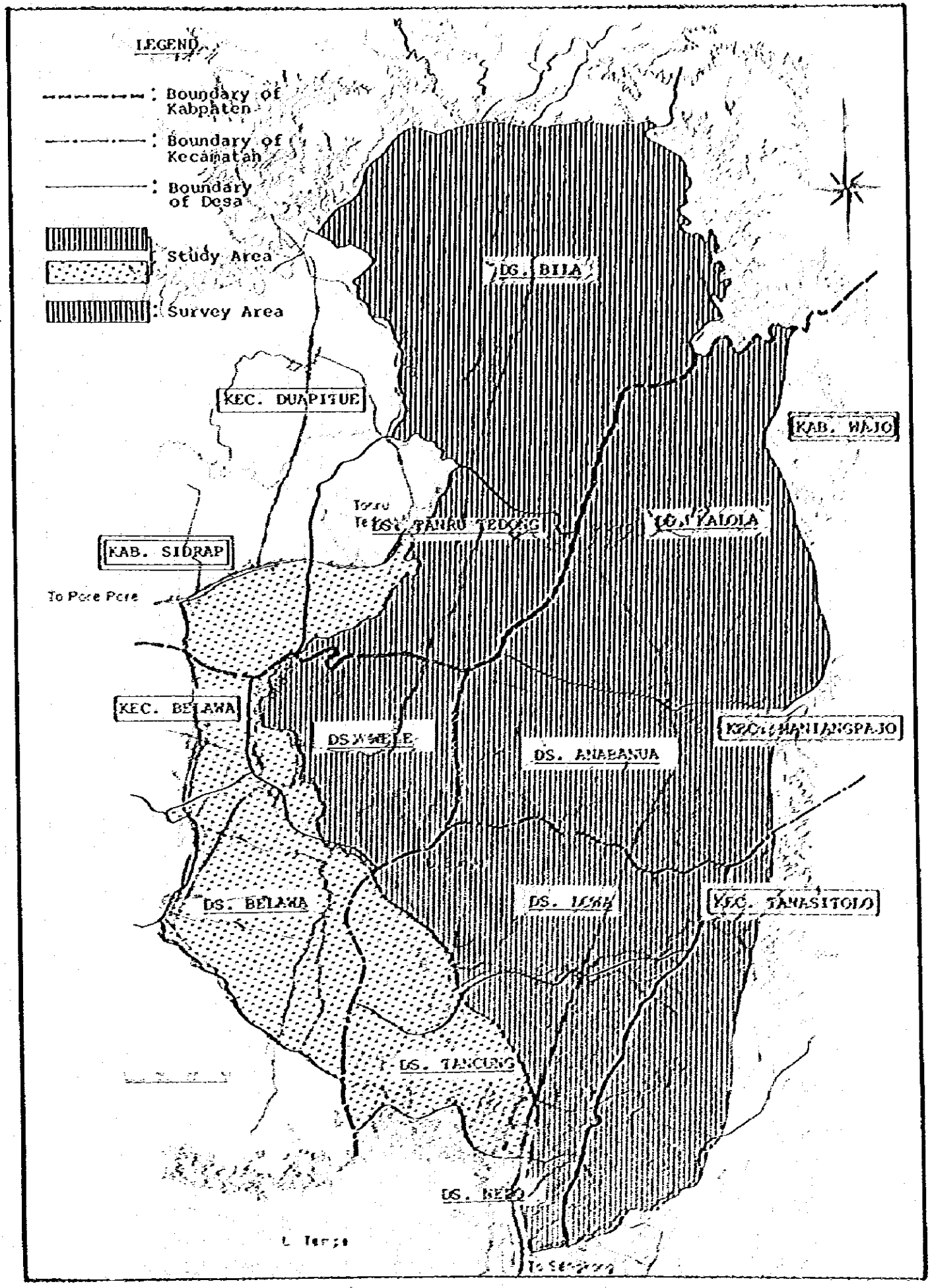
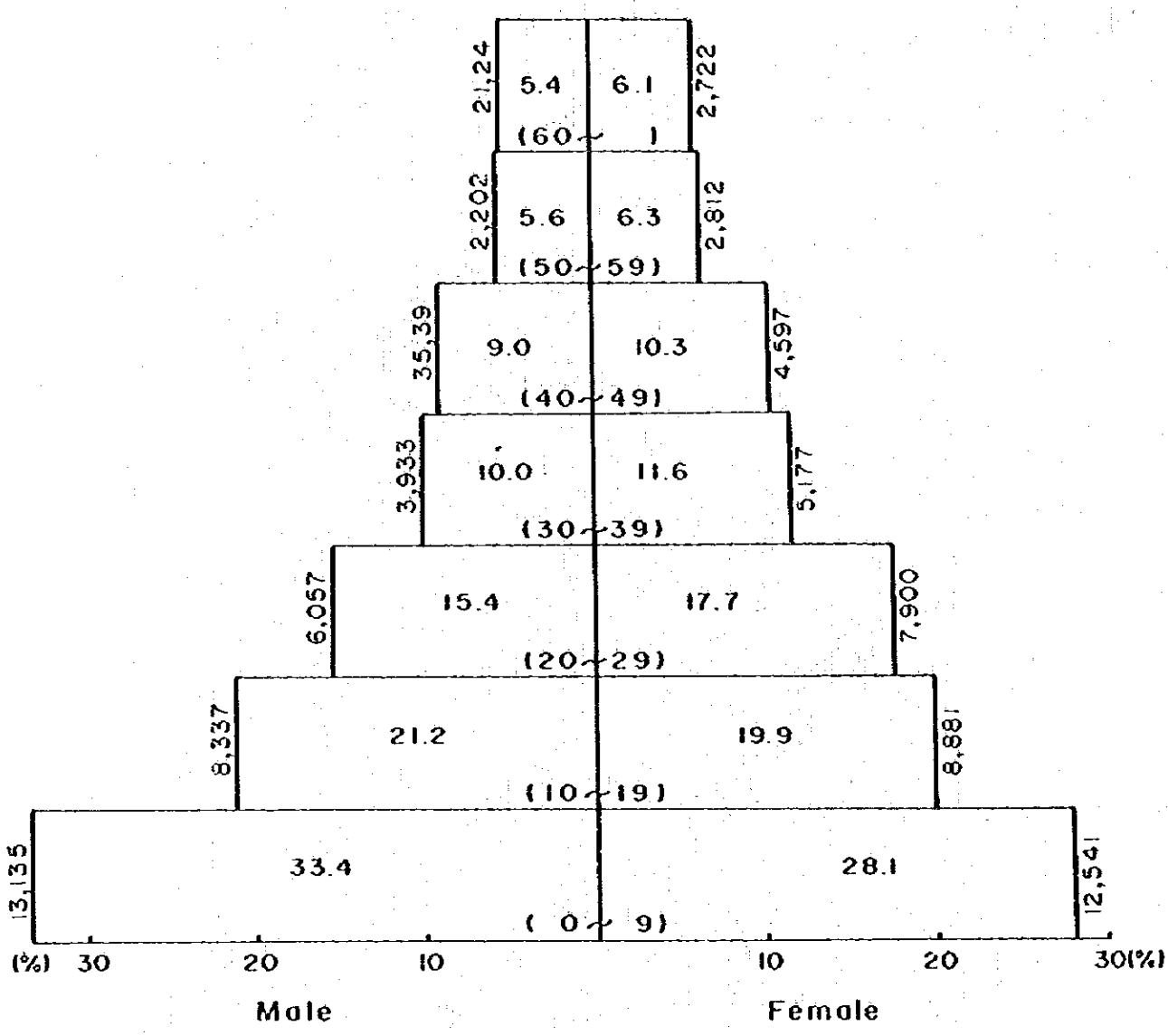


Fig. 2.1 ADMINISTRATIVE BOUNDARIES IN THE STUDY AREA



Total Population : 83,957

Male : 39,327

Female : 44,630

Source : Penduduk Propinsi Sulawesi Selatan 1980 (Hasil - Pencocahan Lengkap), Biro Pusat Statistik, Kantor Statistik Propinsi Selatan

Fig. 2.2 POPULATION STRUCTURE IN THE PROJECT AREA

LEGEND

Land Use Category	Study Area (ha)	Project Area (ha)	Proportional Extent (%)
Paddy field	13,700	11,200	
Upland field	700		
Orchard	1,260		
Forest / Gross land	3,800		
Villages / Others	540		
Total	20,000	11,200	100.0

Fig. 2.3 PRESENT LAND USE MAP IN THE STUDY AREA

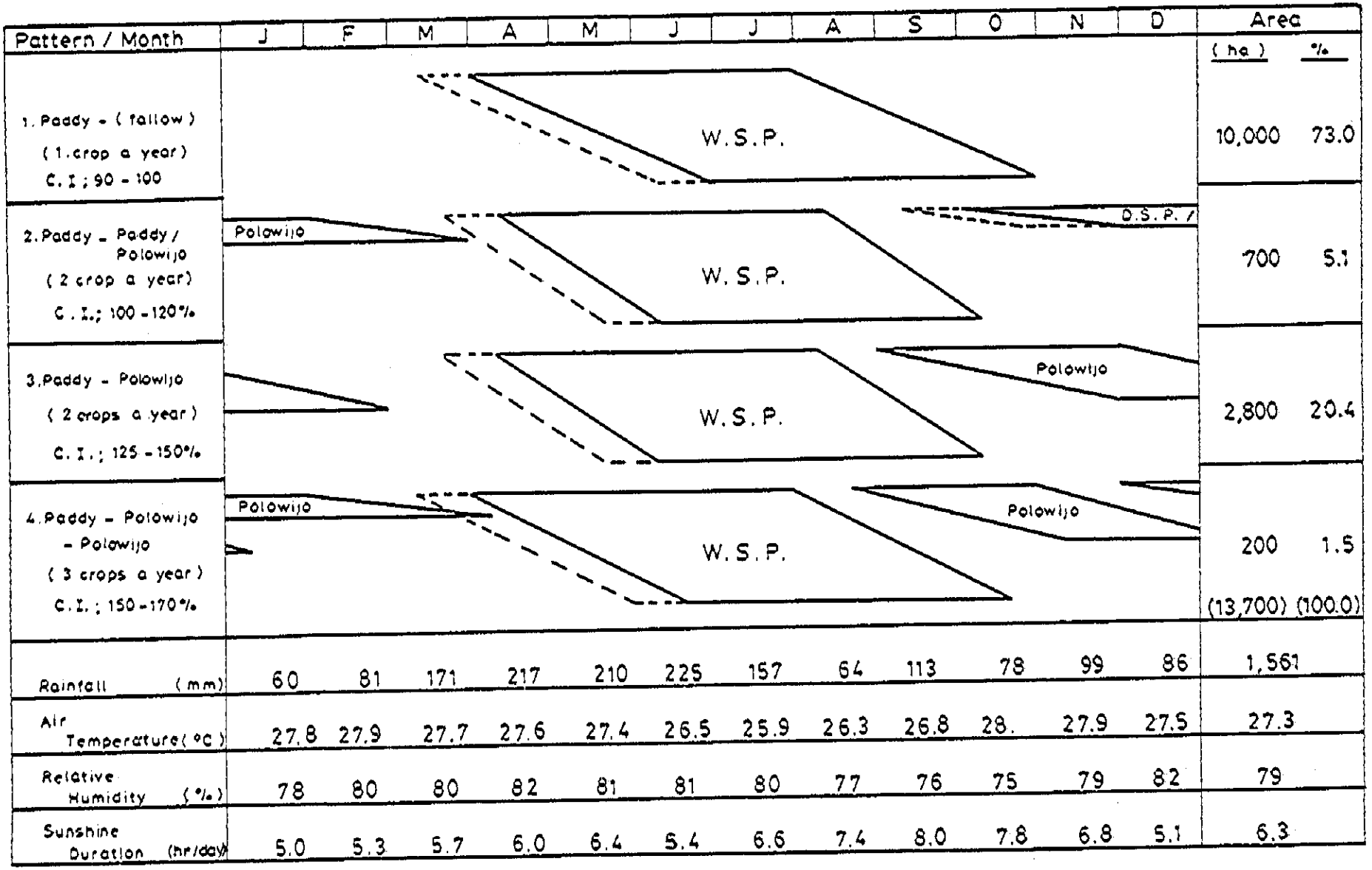


Fig. 2.4 PRESENT CROPPING PATTERNS IN THE STUDY AREA

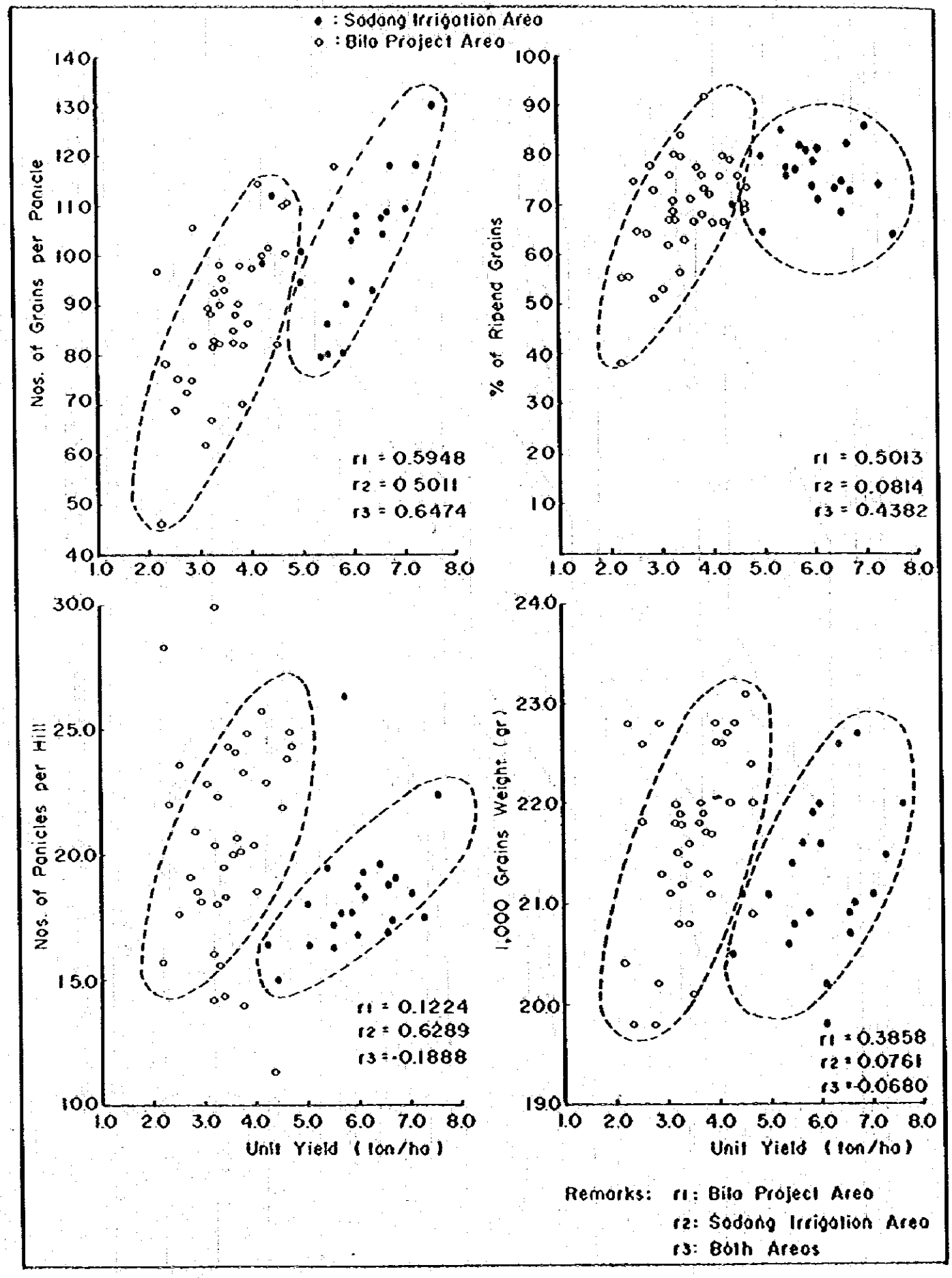
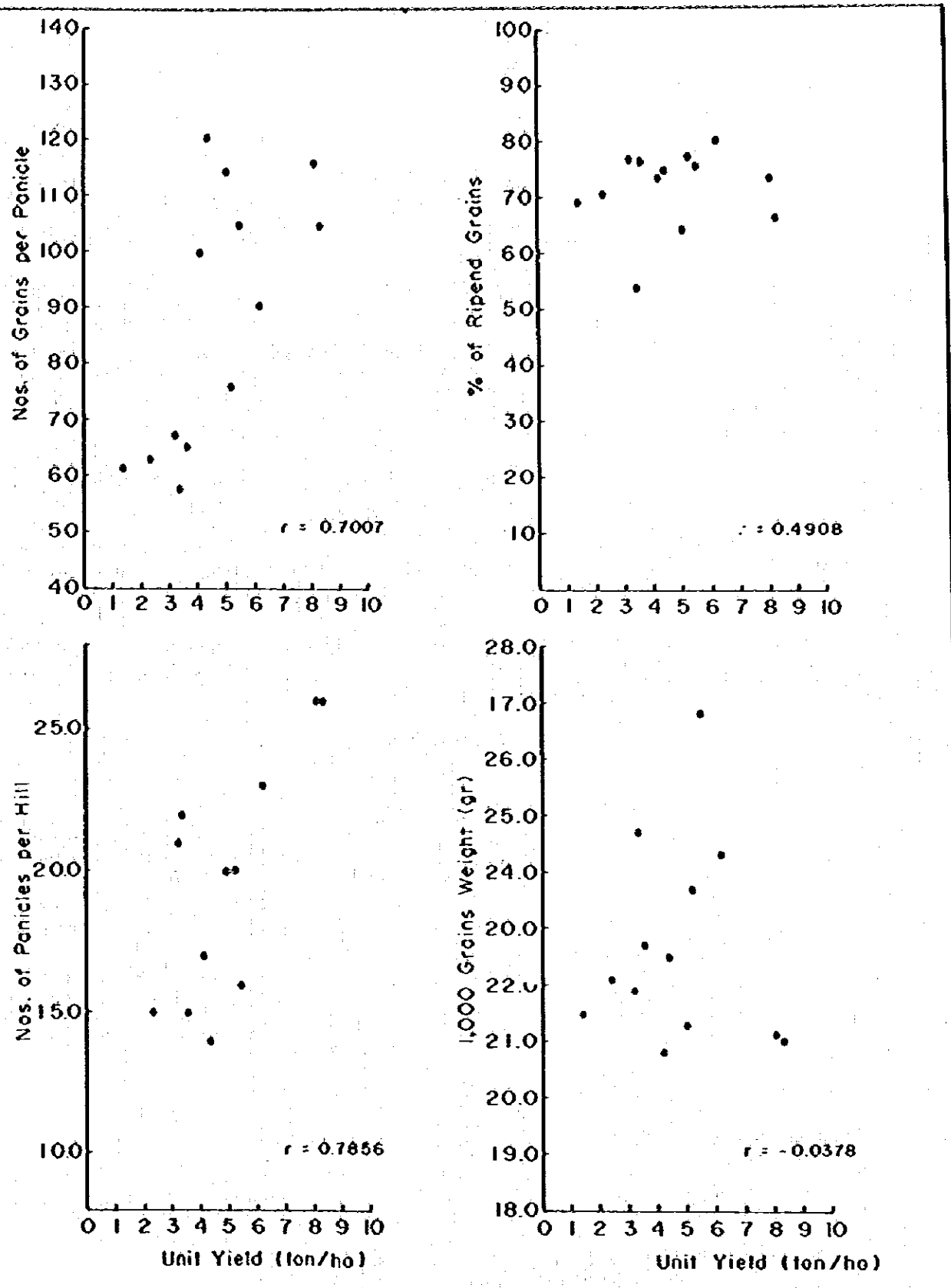
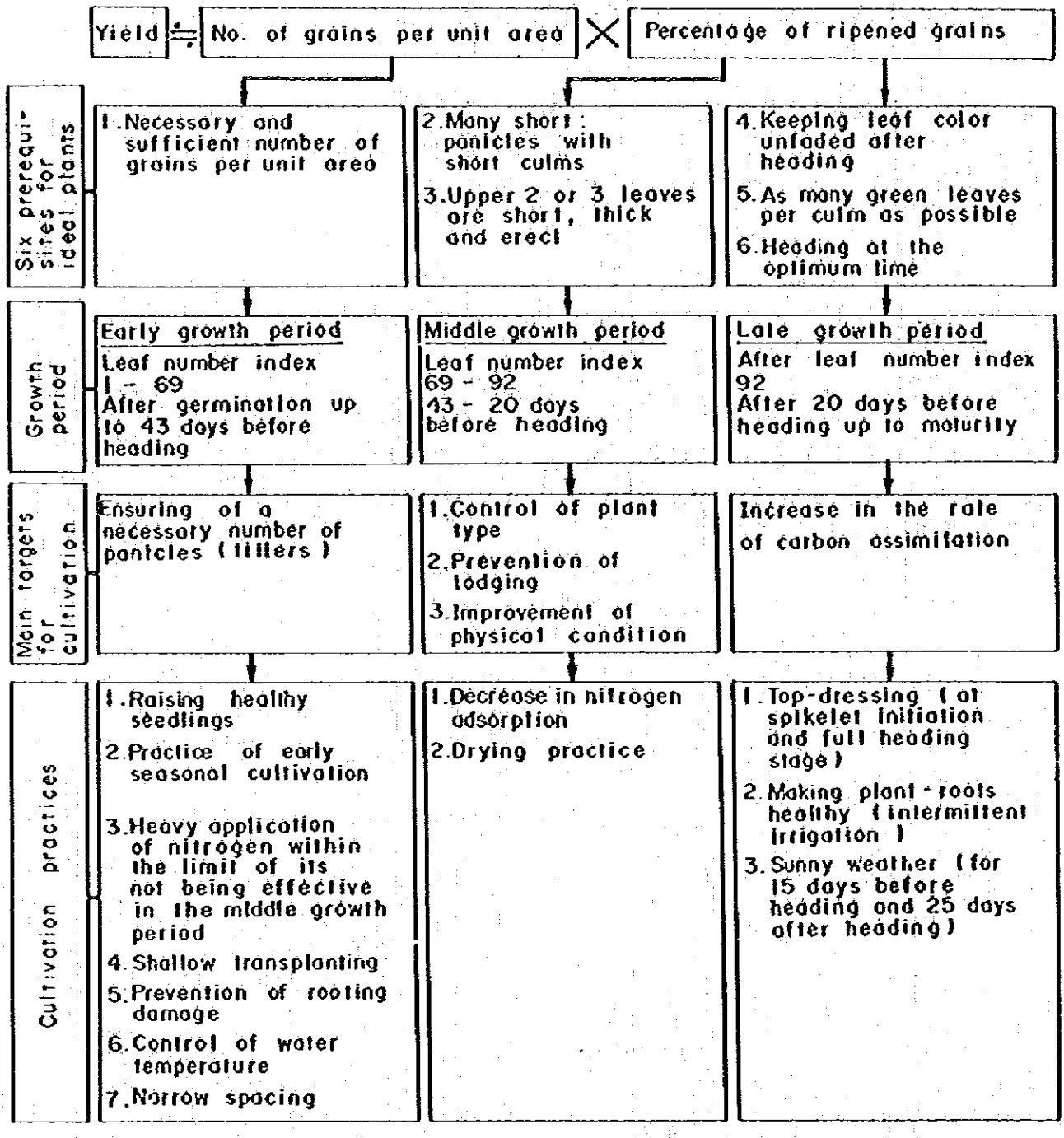


Fig. 2.5 RELATION BETWEEN PADDY YIELD AND YIELD COMPONENTS
(Wet Season Paddy)



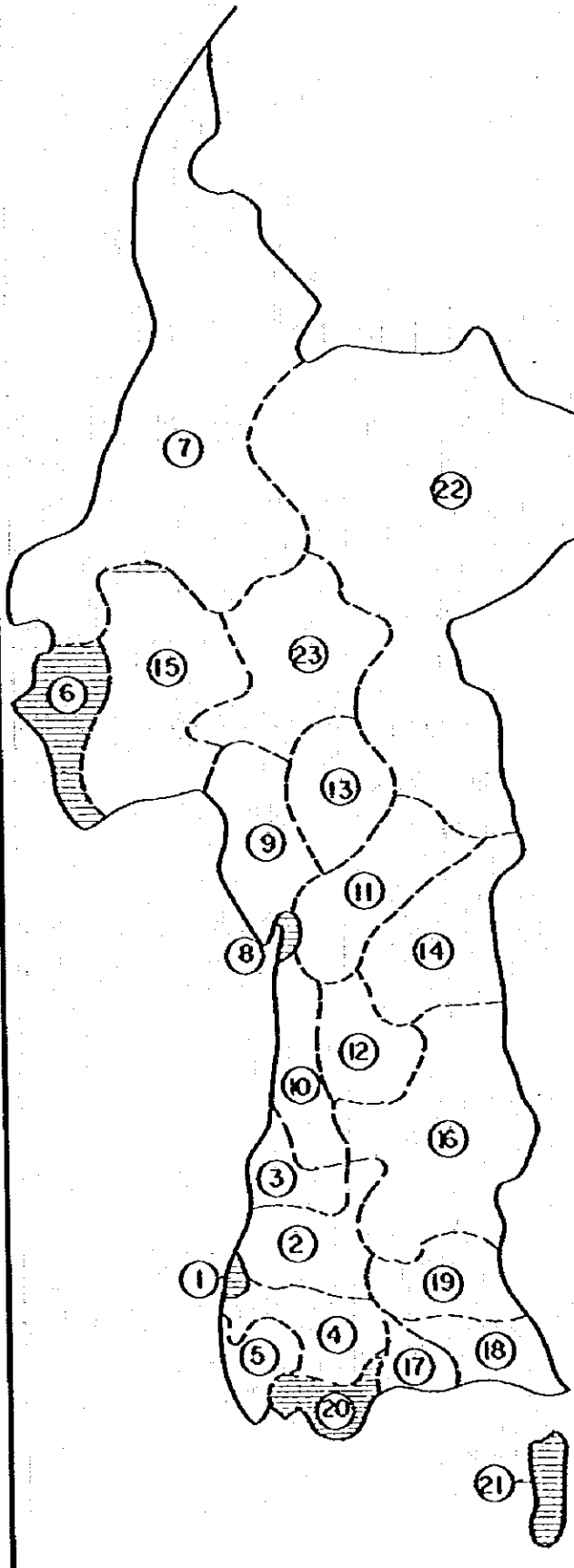
Source: Supporting Report (volume 2) of Master Plan for The Central South Sulawesi Water Resources Development Project, March 1980.

Fig. 2.6 RELATION BETWEEN PADDY YIELD AND YIELD COMPONENTS
(Dry Season Paddy)



Source : S. Matsushima, Rice cultivation for the Million, Japan Scientific Societies Press, 1980

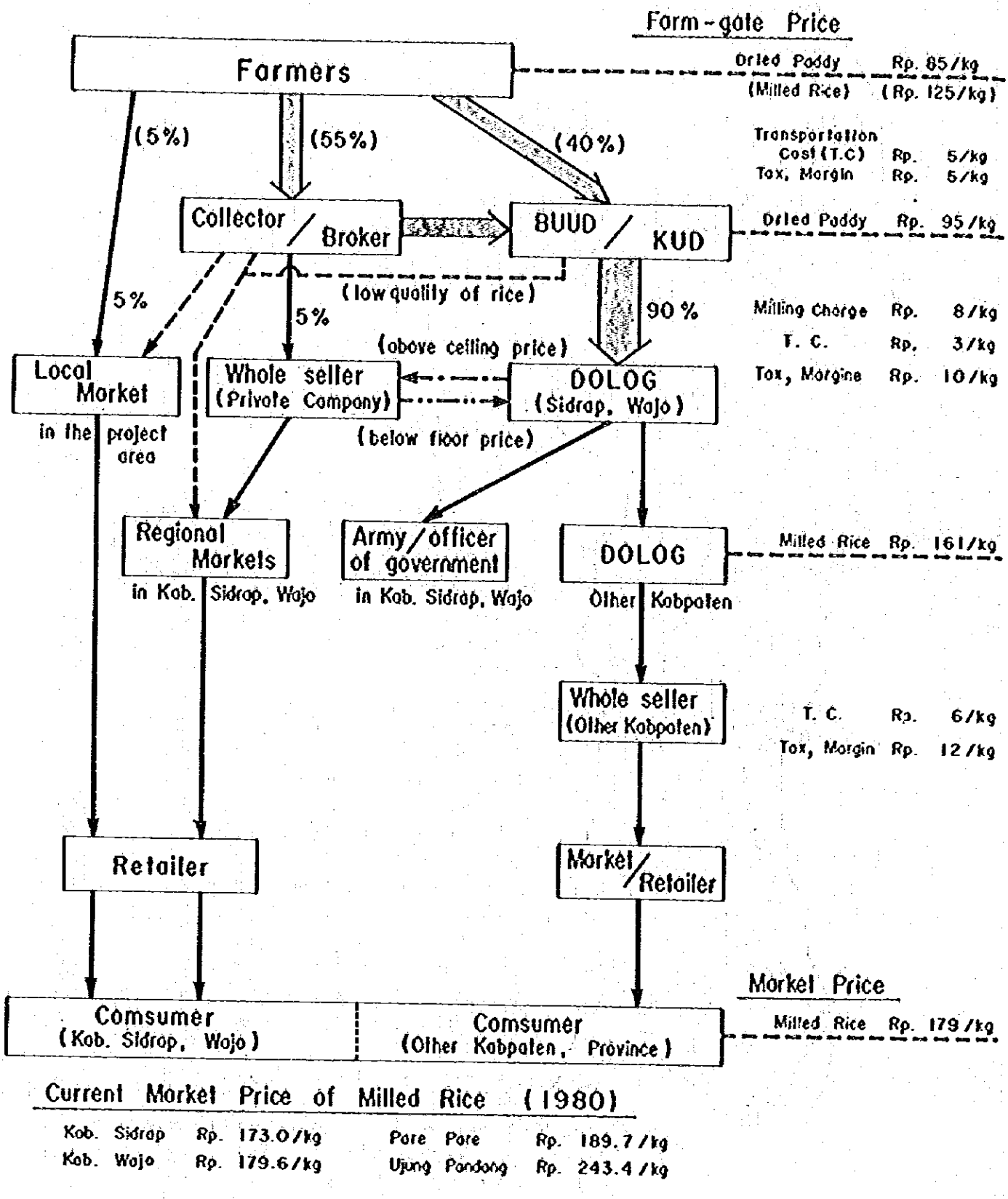
Fig. 2.7 DIAGRAMMATIC GUIDELINE FOR IMPROVEMENT OF RICE CULTIVATION PRACTICES



(Unit : 1,000 tons)

Kab.	Population ($X10^3$)	Paddy Consumption	Paddy Production	Surplus
(1) Ujung Pandang	624	144	10	-134
(2) Maros	186	43	95	52
(3) Pangkep	209	48	117	69
(4) Gowa	341	78	131	53
(5) Takalar	165	38	60	22
(6) Majene	114	26	6	-20
(7) Mamuju	92	21	25	4
(8) Pare Pare	82	19	5	-14
(9) Pinrang	261	60	329	269
(10) Barru	136	31	70	39
(11) Sidrap	200	46	275	229
(12) Soppeng	245	56	196	140
(13) Enrekang	130	30	37	7
(14) Wajo	354	81	257	176
(15) Polmas	361	83	93	10
(16) Bone	624	144	184	40
(17) Bantaeng	111	26	32	6
(18) Bulukumba	295	68	106	38
(19) Sinjai	165	38	50	12
(20) Jeneponto	228	52	40	-12
(21) Selayar	98	23	2	-21
(22) Luwu	453	104	179	75
(23) Tator	322	74	94	20
Total	5,794	1,333	2,395	1,060

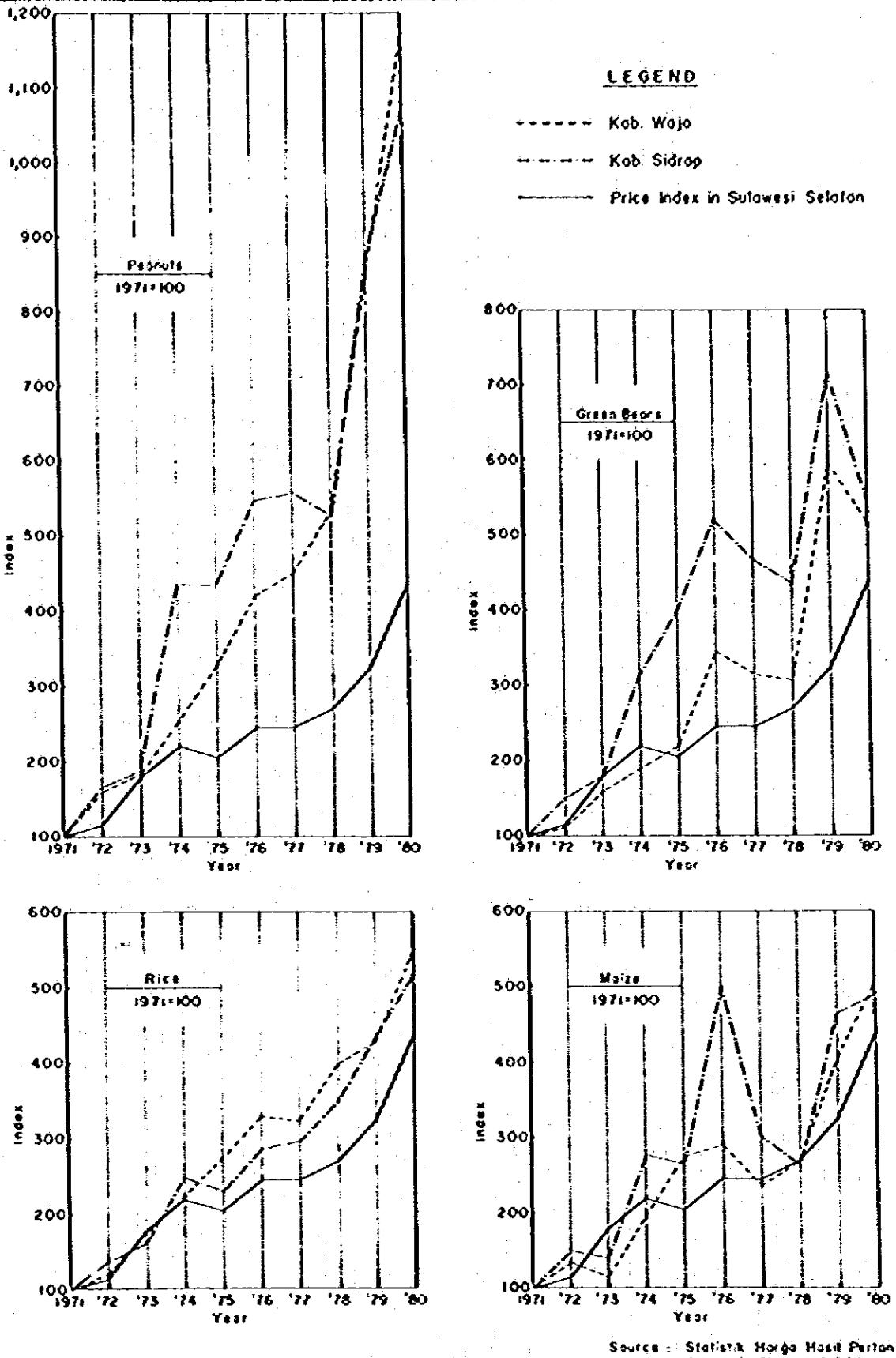
Fig. 2.8 RICE SURPLUS CONDITION IN SOUTH SULAWESI PROVINCE (1979/1980)



Current Market Price of Milled Rice (1980)

Kab. Sidrap	Rp. 173.0/kg	Pare Pare	Rp. 189.7/kg
Kab. Wajo	Rp. 179.6/kg	Ujung Pandang	Rp. 243.4/kg

Fig. 2.9 MARKETING FLOW OF RICE



Source : Statistik Harga Hasil Pertanian Tanaman Pangan (1969 to 1980) Ministry of Agriculture in Sulawesi Selatan, 1980.

Fig. 2.10 RETAIL PRICE OF FARM PRODUCTS IN KAB. WAJO AND KAB. SIDRAP

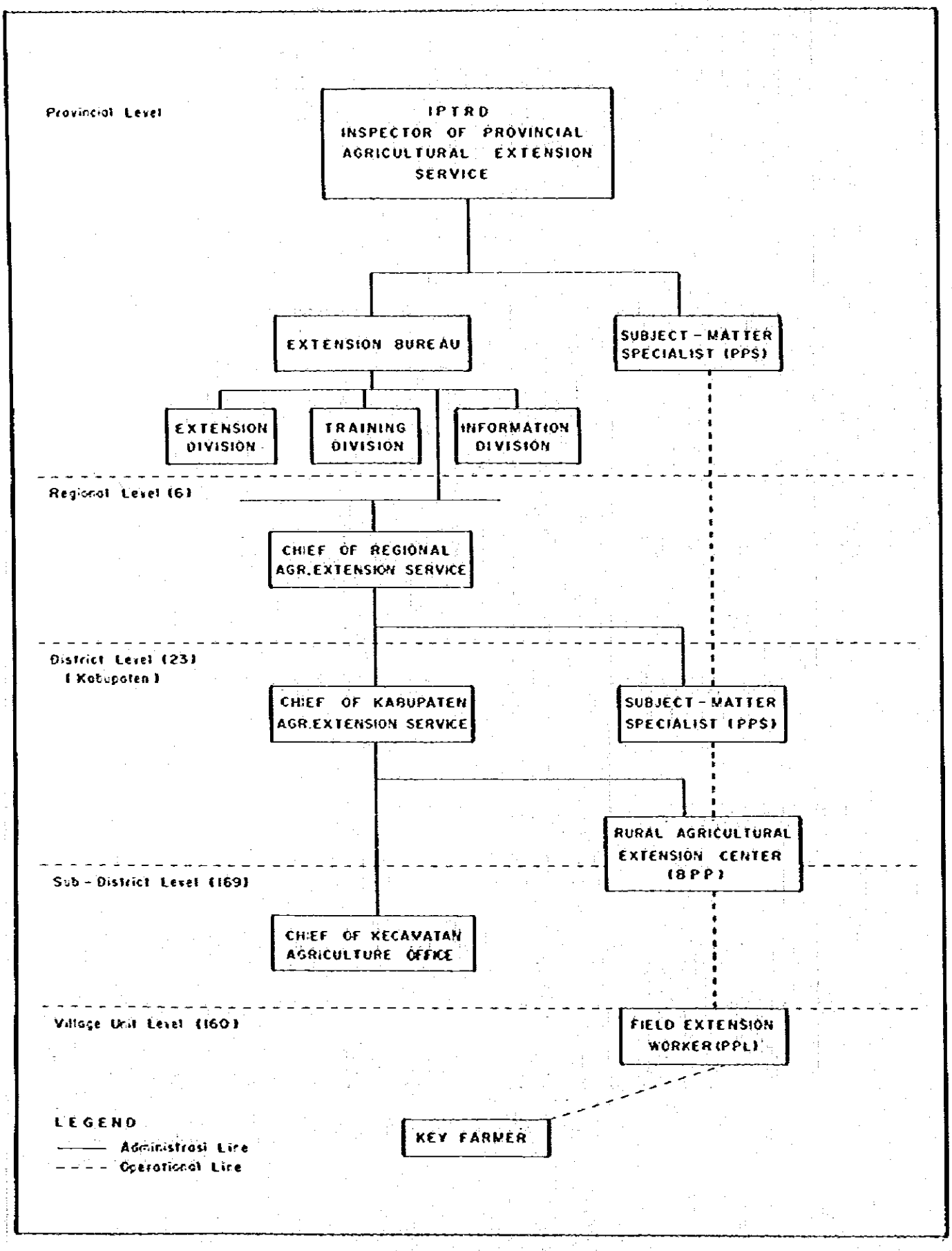


Fig. 3.1 ORGANIZATION CHART OF AGRICULTURAL EXTENSION SERVICE IN SOUTH SULAWESI PROVINCE

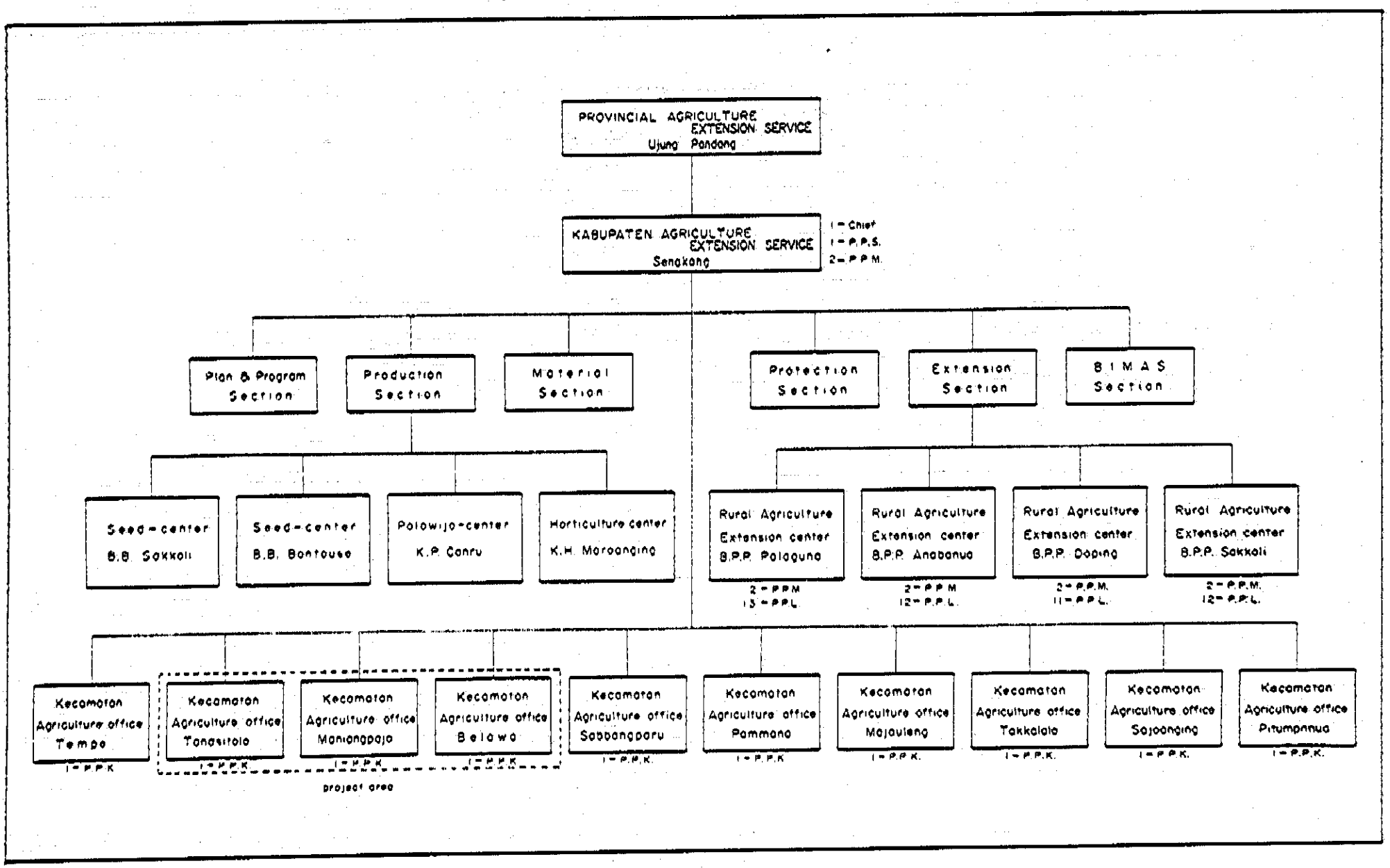


Fig. 3.2 ORGANIZATION FOR DEPARTMENT OF AGRICULTURE (1/2)

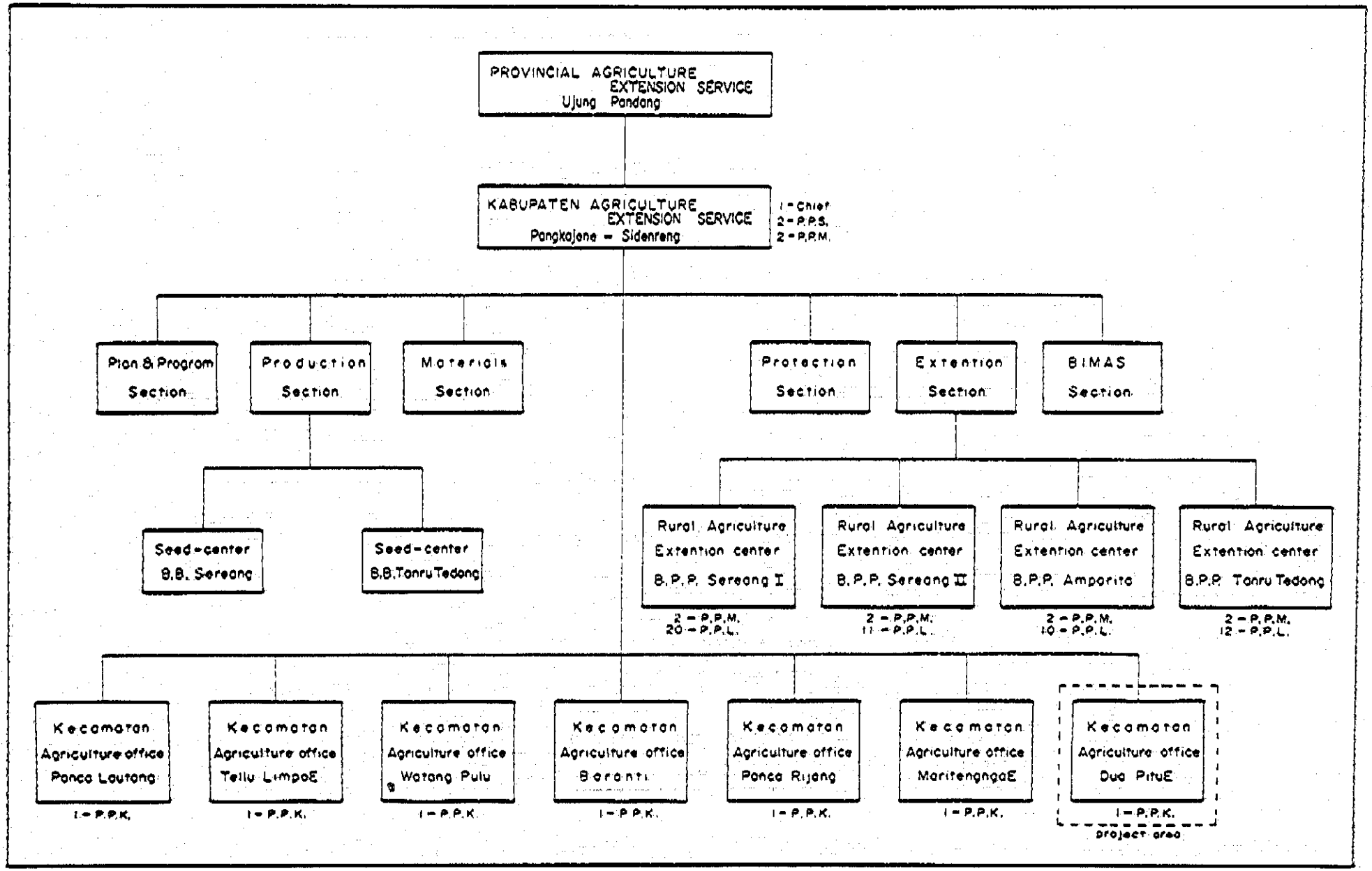


Fig. 3.2 ORGANIZATION FOR DEPARTMENT OF AGRICULTURE (2/2)

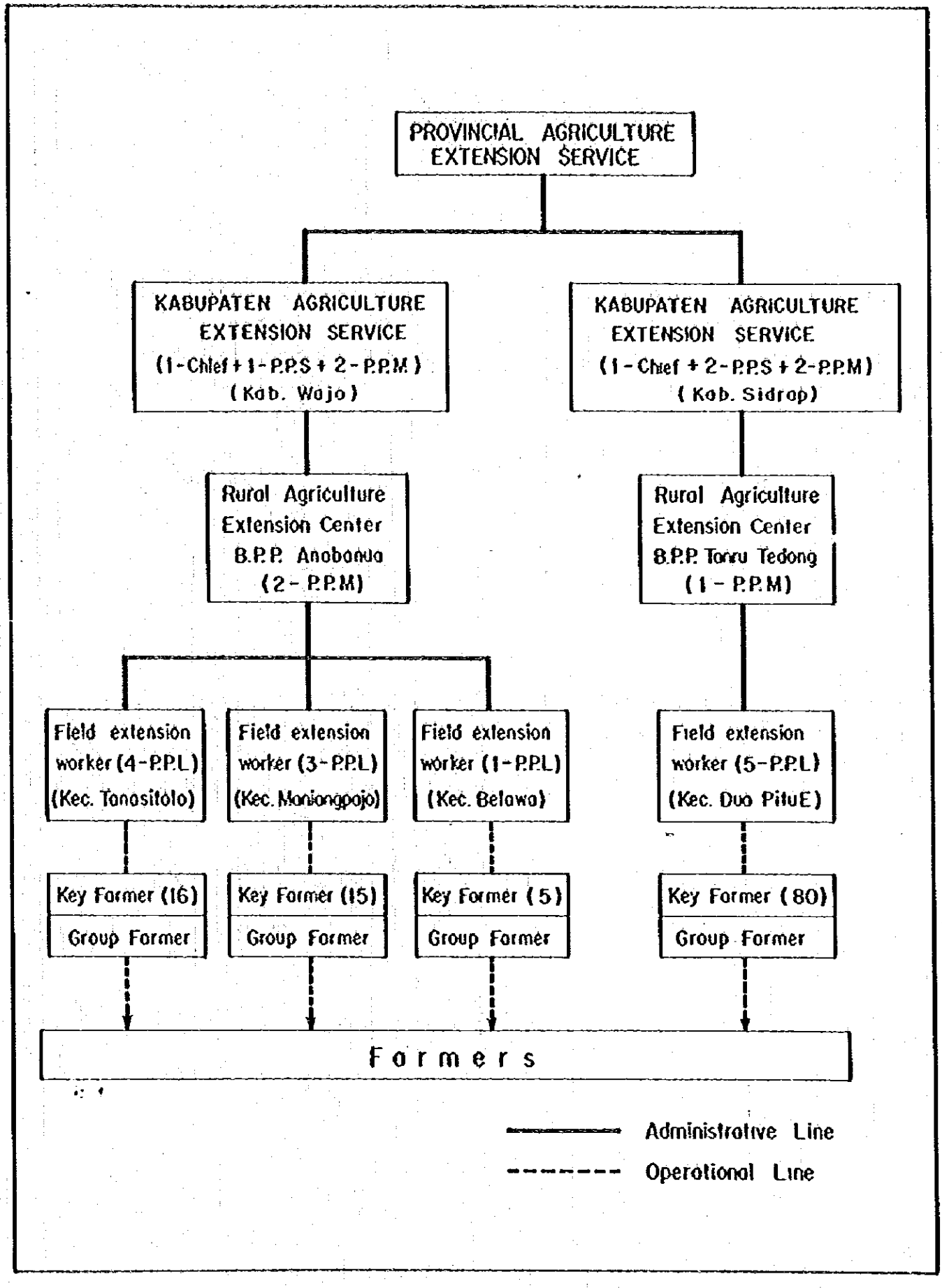


Fig. 3.3 STRUCTURAL ORGANIZATION OF AGRICULTURAL EXTENSION SERVICE IN THE STUDY AREA

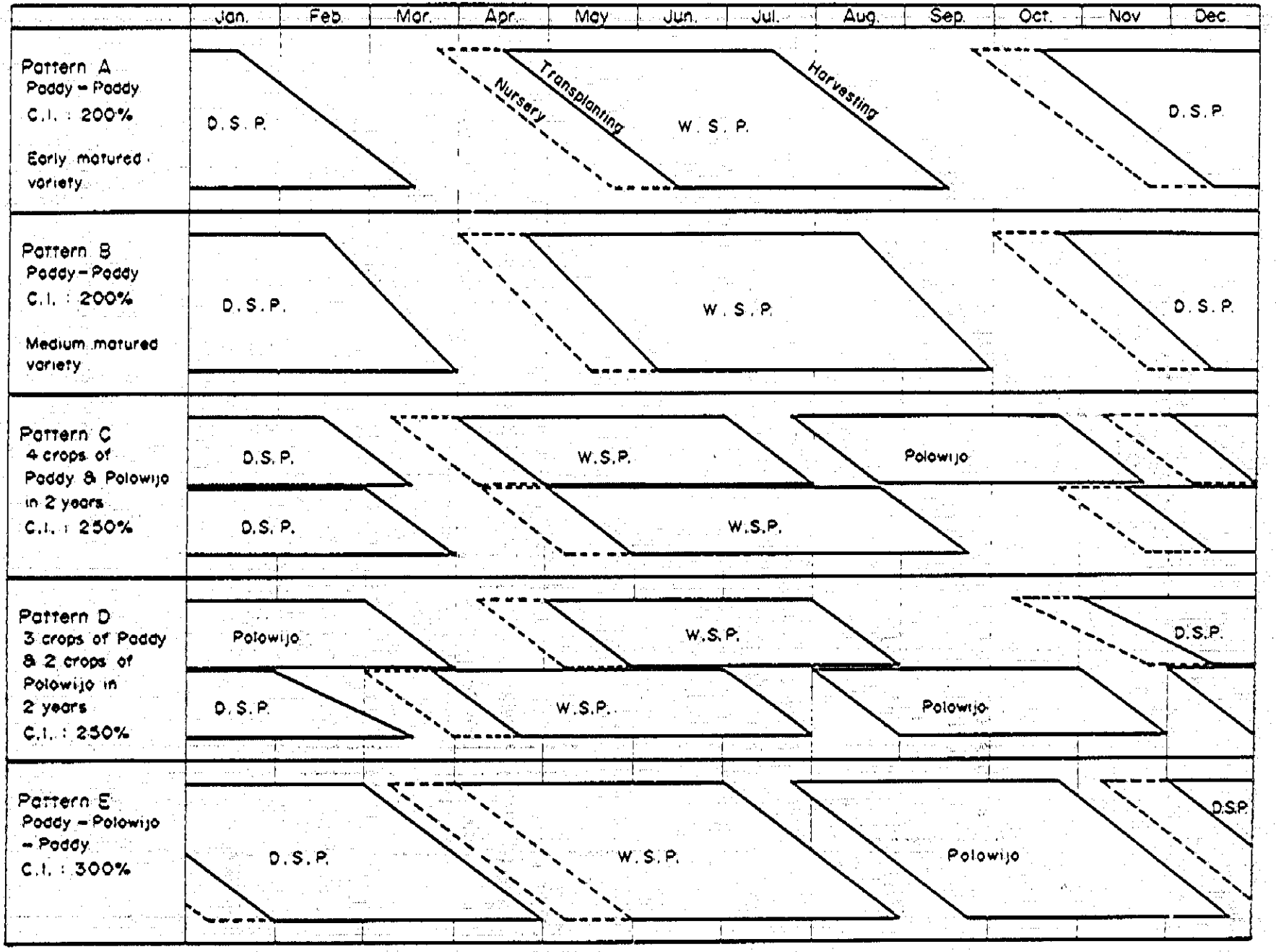


Fig. 5.1 ALTERNATIVE CROPPING PATTERNS

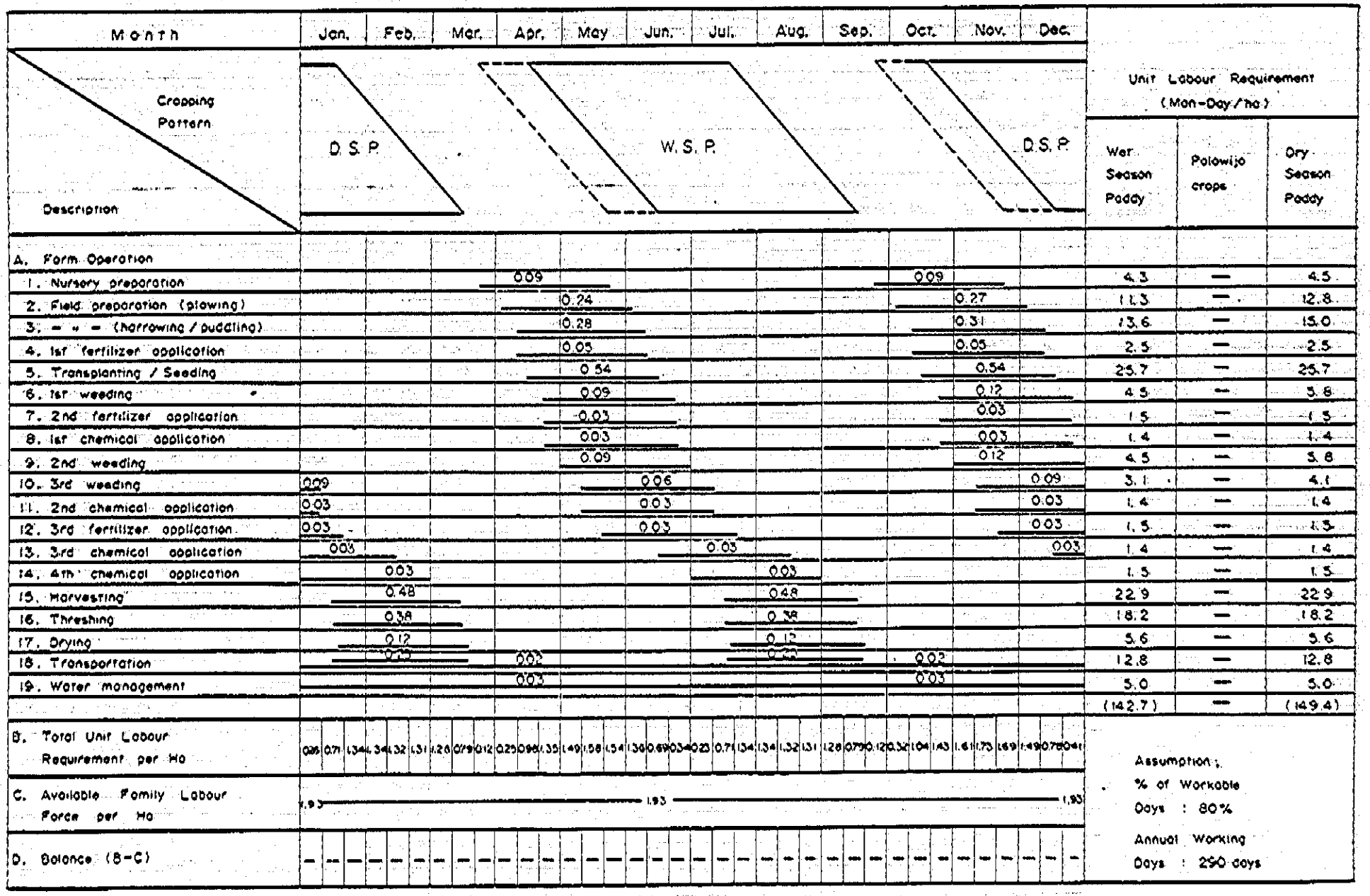


Fig. 5.2 UNIT LABOUR REQUIREMENT PER HA FOR PROPOSED CROPPING PATTERN VS. AVAILABLE LABOUR FORCE (Pattern A) (1/5)

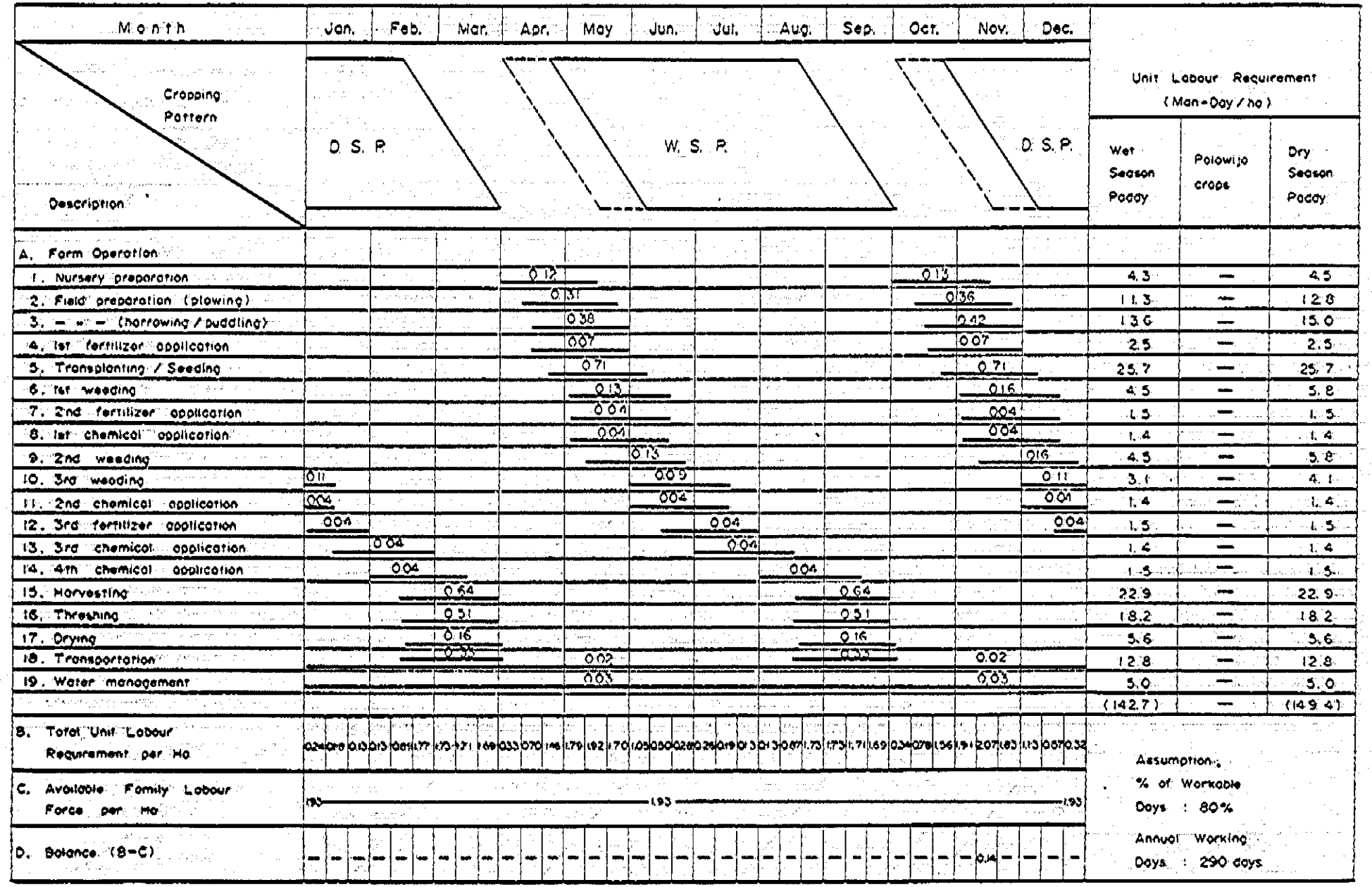
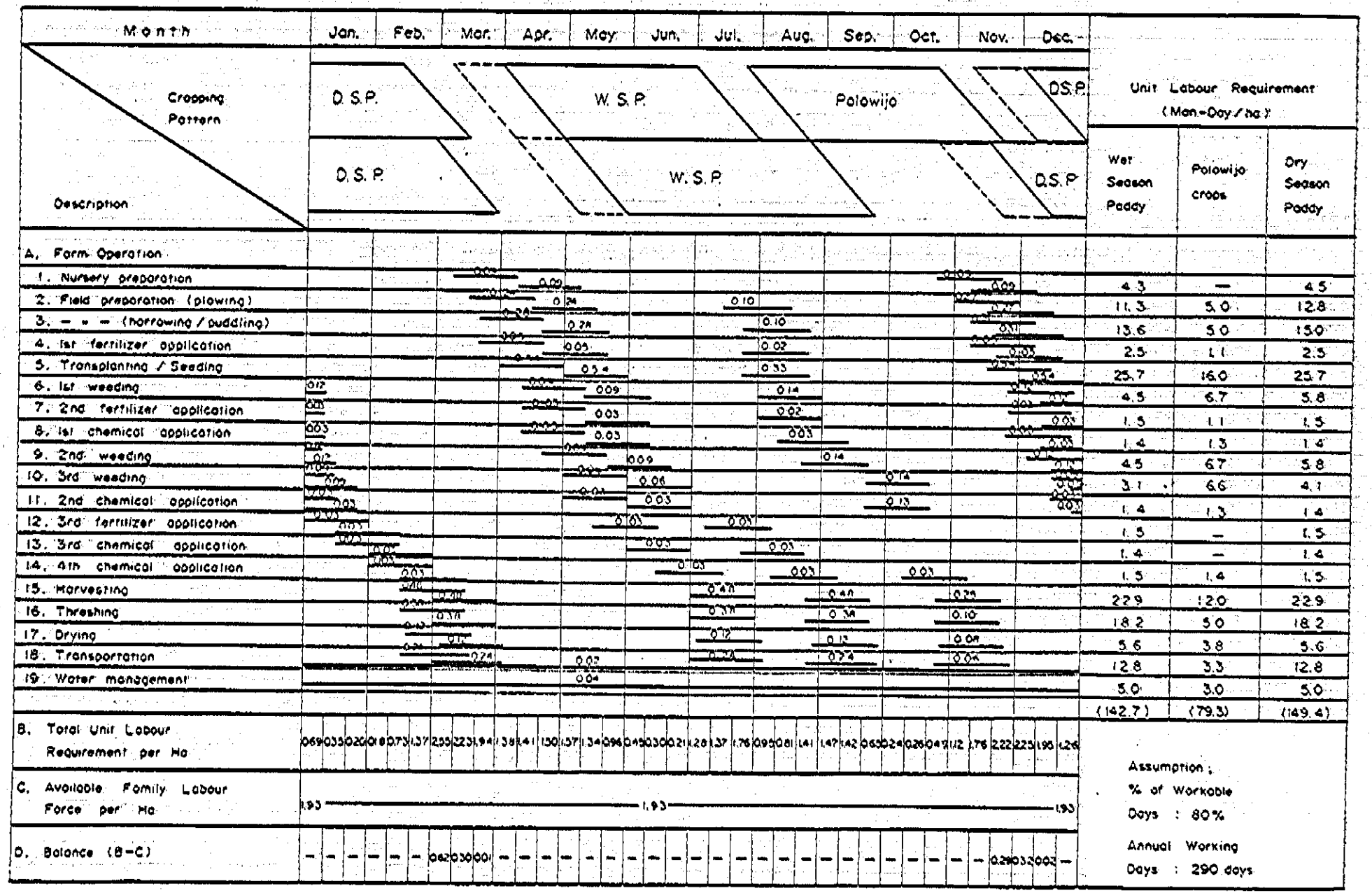


Fig. 5.2 UNIT LABOUR REQUIREMENT PER HA FOR PROPOSED CROPPING PATTERN VS. AVAILABLE LABOUR FORCE (Pattern B) (2/5)


Month
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
Cropping Pattern
Description
D.S.P.
W.S.P.
Polowijo
D.S.P.
D.S.P.
W.S.P.
D.S.P.
Unit Labour Requirement (Man-Day / ha)
Wet Season Paddy
Polowijo crops
Dry Season Paddy
A. Farm Operation
1. Nursery preparation 4.3 — 4.5
2. Field preparation (plowing) 11.3 5.0 12.8
3. — " — (harrowing / puddling) 13.6 5.0 15.0
4. 1st fertilizer application 2.5 1.1 2.5
5. Transplanting / Seeding 25.7 16.0 25.7
6. 1st weeding 4.5 6.7 5.8
7. 2nd fertilizer application 1.5 1.1 1.5
8. 1st chemical application 1.4 1.3 1.4
9. 2nd weeding 4.5 6.7 5.8
10. 3rd weeding 3.1 6.6 4.1
11. 2nd chemical application 1.4 1.3 1.4
12. 3rd fertilizer application 1.5 — 1.5
13. 3rd chemical application 1.4 — 1.4
14. 4th chemical application 1.5 1.4 1.5
15. Harvesting 22.9 12.0 22.9
16. Threshing 18.2 5.0 18.2
17. Drying 5.6 3.8 5.6
18. Transportation 12.8 3.3 12.8
19. Water management 5.0 3.0 5.0
(142.7) (79.3) (149.4)
B. Total Unit Labour Requirement per Ha
0.69 0.33 0.20 0.18 0.73 1.37 2.55 2.23 1.94 1.38 1.41 1.50 1.37 1.34 0.96 0.45 0.30 0.21 1.28 1.37 1.76 0.95 0.81 1.41 1.47 1.42 0.65 0.24 0.26 0.47 1.12 1.76 2.22 2.25 1.93 1.26
C. Available Family Labour Force per Ha
1.93
1.93
1.93
D. Balance (B-C)
— — — — — — 0.62 0.30 0.01 — — — — —

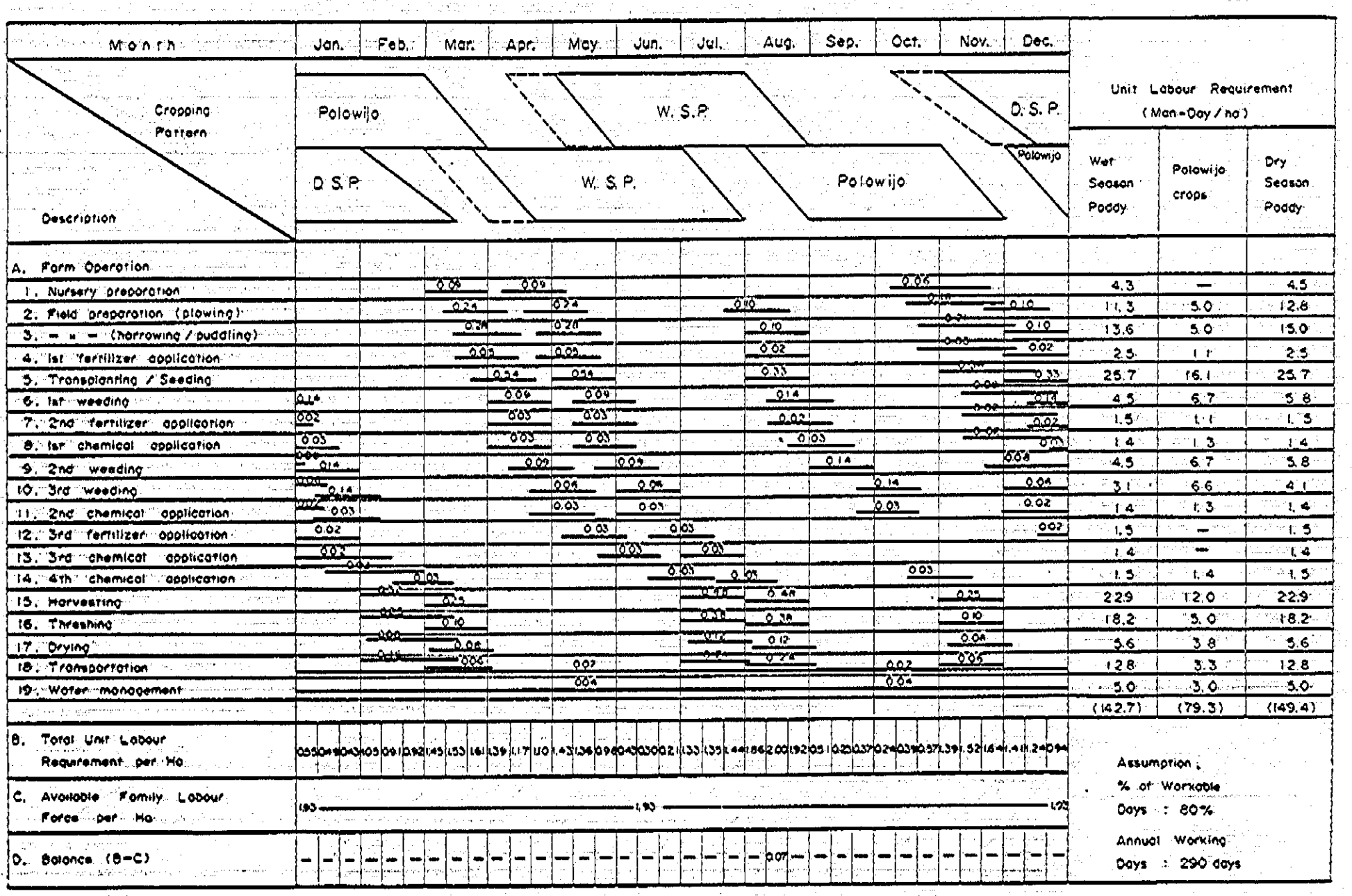


Fig. 5.2 UNIT LABOUR REQUIREMENT PER HA FOR PROPOSED CROPPING PATTERN VS. AVAILABLE LABOUR FORCE (Pattern D) (4/5)

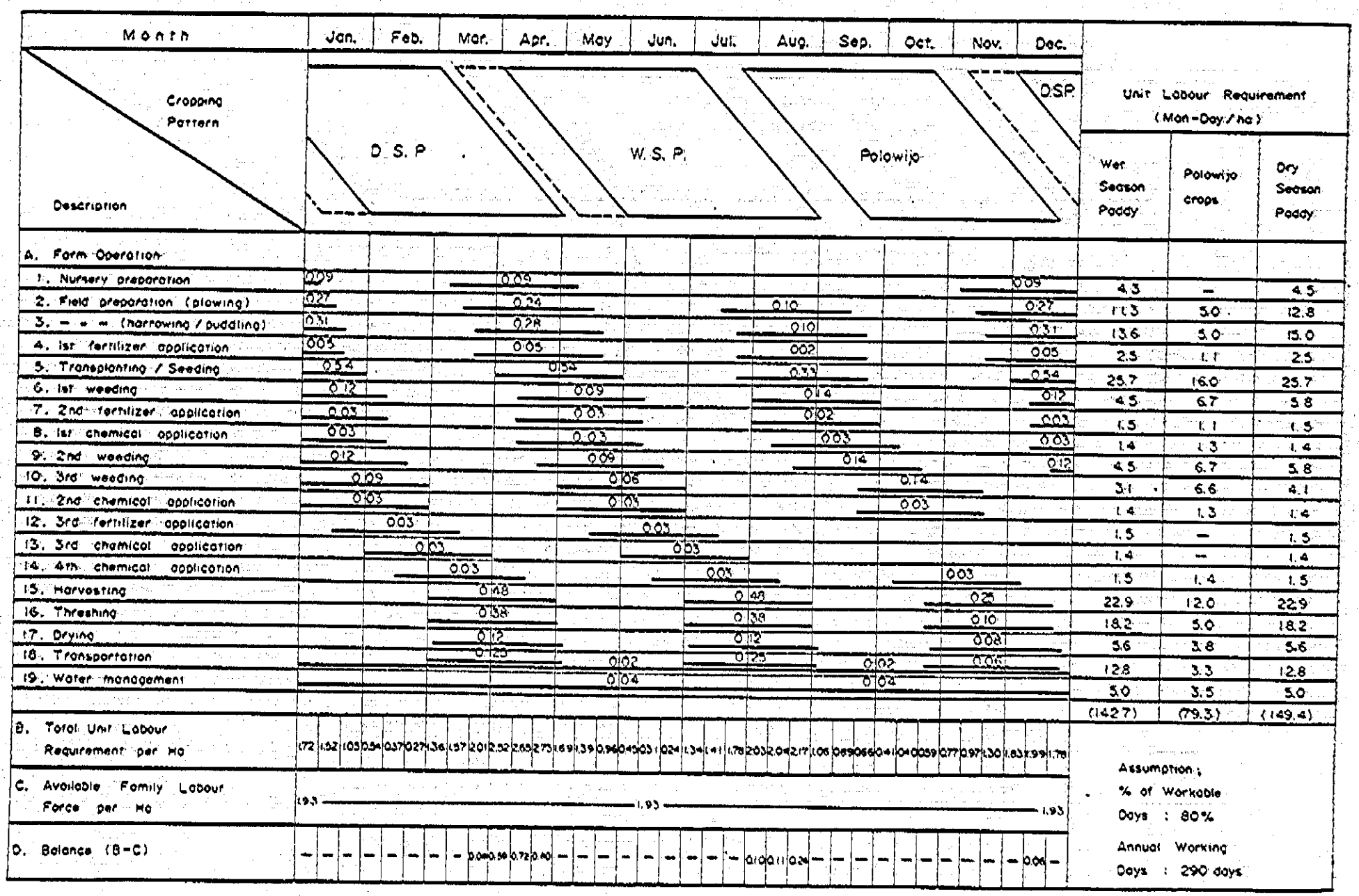


Fig. 5.2 UNIT LABOUR REQUIREMENT PER HA FOR PROPOSED CROPPING PATTERN VS. AVAILABLE LABOUR FORCE (Pattern E) (5/5)

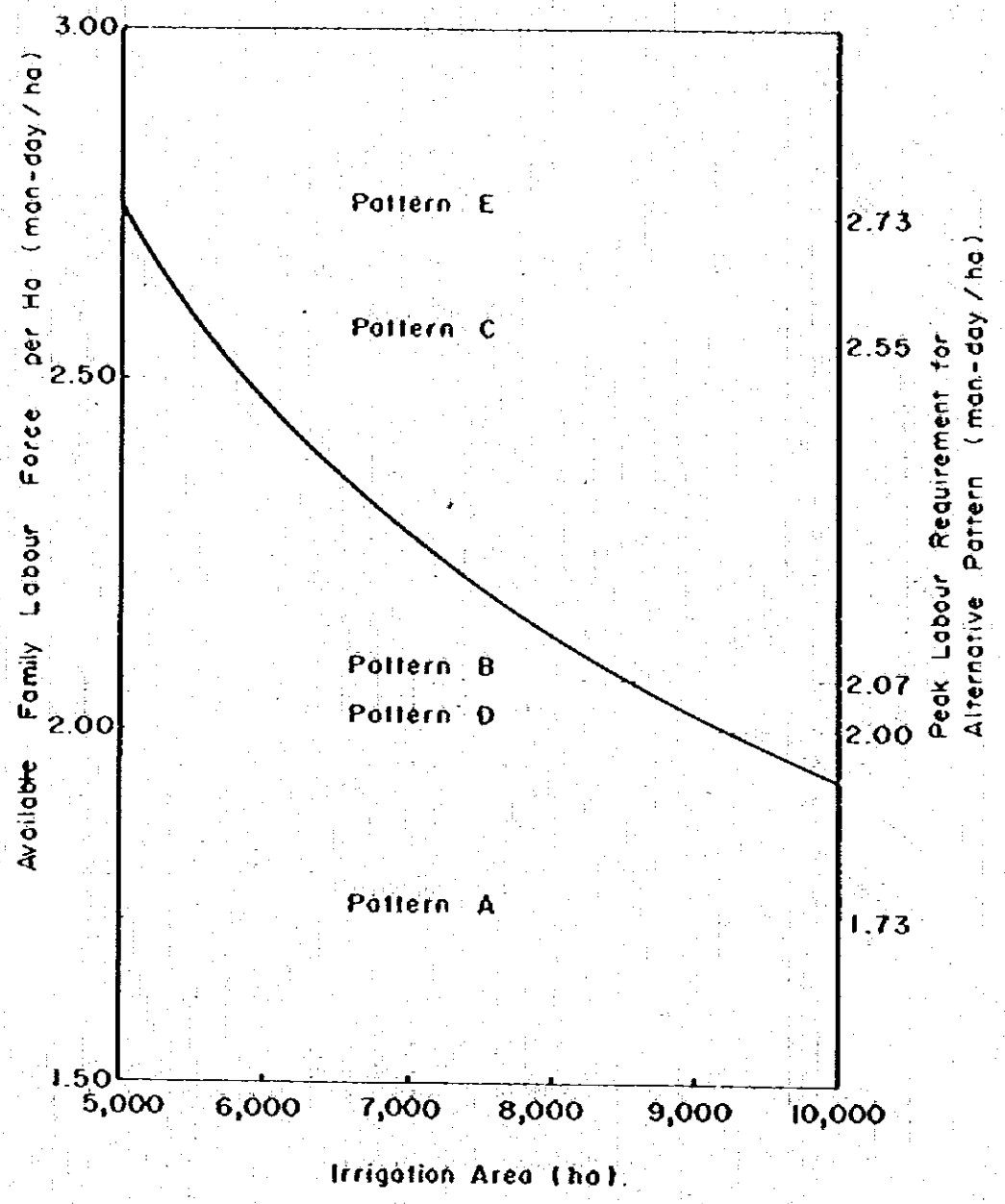


Fig. 5.3 RELATION BETWEEN AVAILABLE LABOUR FORCE AND IRRIGABLE AREA (Adaptability of alternative Cropping Pattern under different Irrigation Areas)

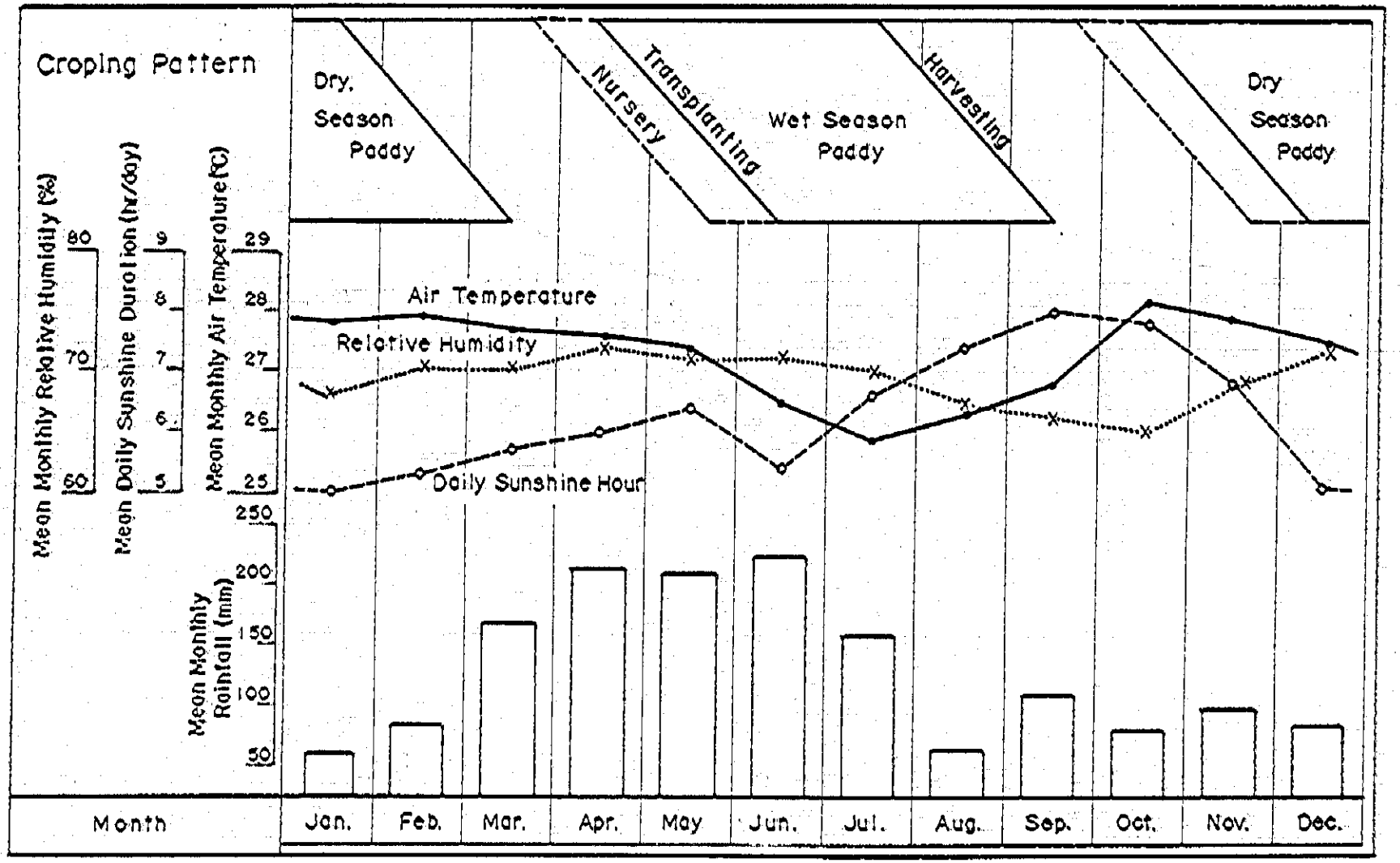


Fig. 5.4 PROPOSED CROPPING PATTERN
(Pattern A)

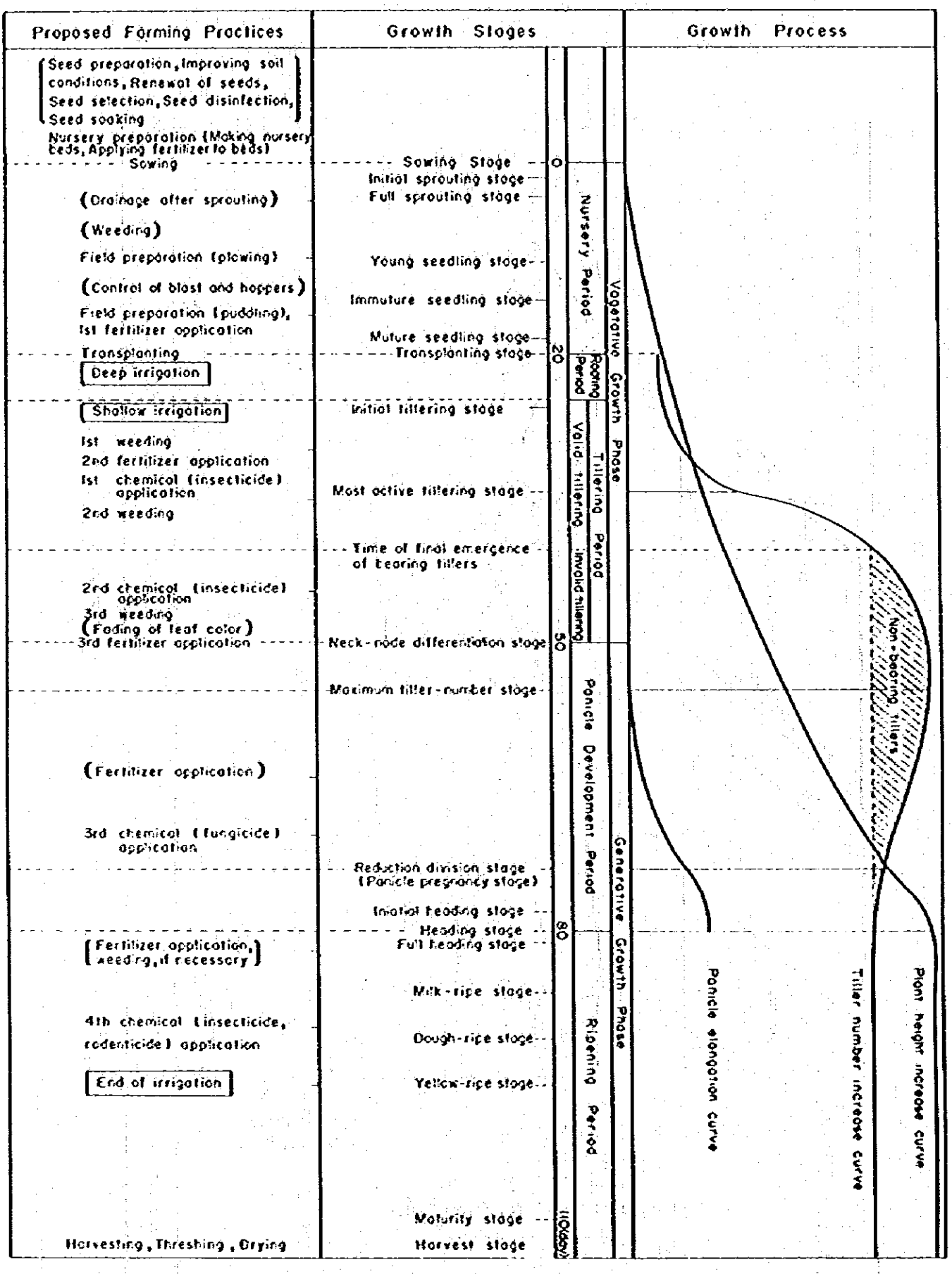


Fig. 5.5 GROWTH PROCESS OF THE RICE PLANT AND PROPOSED FARMING PRACTICES AT EACH GROWTH STAGE