

Table IV.2.3 AGRICULTURAL LAND USE IN THE PROJECT AREA

Area	Net	Paddy	Maize	Wheat	Maize/ Soyabean	Mustard	Buck- wheat	Barley	Potato	Chili	Total
I. WET LAND											
Lhuntshi District											
1 Pang Khar	6	6	-	-	-	-	-	-	-	-	6
2 Ganzoor	16	16	-	-	-	-	-	-	-	-	16
3 Tangmachhu	185	184	-	4	-	-	-	-	-	-	188
4 Minji	116	116	-	-	-	-	-	-	-	-	116
5 Menjibi	12	12	-	-	-	-	-	-	-	-	12
6 Kupinesa	16	16	-	-	-	-	-	-	-	-	16
7 Wambur	43	43	-	-	-	-	-	-	-	-	43
Sub-total	394	393	0	4	0	0	0	0	0	0	397
Mongar District											
8 Chali	54	54	16	-	-	-	-	-	-	-	70
9 Karbithang	10	10	-	-	-	-	-	-	-	-	10
10 Karibee	0	-	-	-	-	-	-	-	-	-	0
11 Masangdaza	16	16	-	-	-	-	-	-	-	-	16
12 Pangsibi	0	-	-	-	-	-	-	-	-	-	0
13 Gyelposhing	38	21	-	-	-	-	1	-	-	1	23
14 Kalapang	0	-	-	-	-	-	-	-	-	-	0
15 Yadi	29	29	-	-	-	-	10	-	-	-	39
16 Chaskhar	46	46	-	-	-	-	4	-	-	-	50
Sub-total	193	176	16	0	0	0	15	0	0	1	192
Wet land total	587	569	16	4	0	0	15	0	0	1	585
II. DRY LAND											
Lhuntshi District											
1 Pang Khar	19	-	-	-	19	-	-	-	-	2	21
2 Ganzoor	18	-	18	-	-	-	-	-	-	-	18
3 Tangmachhu	102	-	102	-	-	-	-	-	-	-	102
4 Minji	42	-	-	-	42	-	-	-	-	-	42
5 Menjibi	7	-	7	-	-	-	-	-	-	-	7
6 Kupinesa	38	-	-	-	38	-	-	-	-	-	38
7 Wambur	81	-	-	-	81	-	-	-	-	-	81
Sub-total	307	0	127	0	180	0	0	0	0	2	309
Mongar District											
8 Chali	100	-	100	8	-	8	-	-	-	-	116
9 Karbithang	0	-	-	-	-	-	-	-	-	-	0
10 Karibee	22	-	36	-	-	-	-	-	-	-	36
11 Masangdaza	39	-	39	-	-	-	22	-	-	-	61
12 Pangsibi	18	-	18	-	-	-	-	-	-	-	18
13 Gyelposhing	4	-	4	-	-	-	-	-	-	1	5
14 Kalapang	9	-	9	-	-	-	2	-	-	-	11
15 Yadi	77	-	77	-	-	-	2	40	-	-	119
16 Chaskhar	186	-	186	-	-	-	-	100	10	-	296
Sub-total	455	0	469	8	0	8	26	140	10	1	662
Dry land total	762	0	596	8	180	8	26	140	10	3	971
III. TSHERI LAND											
Lhuntshi District											
1 Pang Khar	9	-	-	2	-	-	-	-	-	-	2
2 Ganzoor	4	-	2	-	-	-	-	-	-	-	2
3 Tangmachhu	98	-	14	-	-	-	-	-	-	-	14
4 Minji	20	-	-	-	6	-	-	-	-	-	6
5 Menjibi	3	-	1	-	-	-	-	-	-	-	1
6 Kupinesa	32	-	-	-	6	-	-	-	-	-	6
7 Wambur	16	-	5	-	-	-	-	-	-	-	5
Sub-total	182	0	22	2	12	0	0	0	0	0	36
Mongar District											
8 Chali	50	-	10	0	-	-	-	-	-	-	10
9 Karbithang	0	-	0	0	-	-	-	-	-	-	0
10 Karibee	15	-	3	0	-	-	-	-	-	-	3
11 Masangdaza	0	-	0	0	-	-	-	-	-	-	0
12 Pangsibi	5	-	2	0	-	-	-	-	-	-	2
13 Gyelposhing	0	-	0	0	-	-	-	-	-	-	0
14 Kalapang	5	-	3	0	-	-	-	-	-	-	3
15 Yadi	30	-	6	0	-	-	-	-	-	-	6
16 Chaskhar	73	-	14	4	-	-	-	-	-	-	18
Sub-total	178	0	38	4	0	0	0	0	0	0	42
Tsheri land total	360	0	60	6	12	0	0	0	0	0	78

Table IV.2.4 LAND HOLDING STATUS IN THE STUDY AREA

Land Holding Size (ha)	Owner Operator		Area		Average Size (ha)
	Number	(%)	Area (ha)	(%)	
<u>I. Lhuntshi District</u>					
Below 0.2	10	1.8	1.4	0.1	0.14
0.2 - 0.4	5	0.9	1.4	0.2	0.28
0.4 - 0.6	14	2.6	4.2	0.5	0.30
0.6 - 0.8	26	4.7	15.1	1.6	0.58
0.8 - 1.0	100	18.2	76.7	8.3	0.77
1.0 - 1.2	84	15.3	95.7	10.4	1.14
1.2 - 1.4	16	2.9	20.4	2.2	1.28
1.4 - 1.6	35	6.4	41.0	4.5	1.17
1.6 - 1.8	90	16.4	146.5	15.9	1.63
1.8 - 2.0	45	8.2	101.7	11.0	2.26
Above 2.0	124	22.6	416.9	45.3	3.36
Total	549	100	921.0	100	1.68
<u>II. Masangdaza District</u>					
Below 0.2	118	15.5	11.5	1.4	0.10
0.2 - 0.4	72	9.5	18.5	2.3	0.26
0.4 - 0.6	57	7.5	30.6	3.7	0.54
0.6 - 0.8	82	10.8	59.9	7.3	0.73
0.8 - 1.0	93	12.2	81.3	10.0	0.87
1.0 - 1.2	65	8.5	79.3	9.7	1.22
1.2 - 1.4	81	10.6	100.6	12.3	1.24
1.4 - 1.6	50	6.6	69.3	8.5	1.39
1.6 - 1.8	42	5.5	80.9	9.9	1.93
1.8 - 2.0	23	3.0	43.7	5.4	1.90
Above 2.0	78	10.3	240.8	29.5	3.09
Total	761	100.0	816.4	100.0	1.07

Source : Demographic surveys in the project schemes.

Table IV.2.5 CROPPING INTENSITY IN THE PROJECT AREA

Area	Wet land			Dry land			Tsheri land			Total		
	Net	Cropped area	Intensity	Net	Cropped area	Intensity	Net	Cropped area	Intensity	Net	Cropped area	Intensity
Lhuntshi District												
1 Pang Khar	6	6	100%	19	21	111%	9	2	22%	34	29	85%
2 Ganzoor	16	16	100%	18	18	100%	4	2	50%	38	36	95%
3 Tangmachhu	185	188	102%	102	102	100%	98	14	14%	385	304	79%
4 Minji	116	116	100%	42	42	100%	20	6	30%	178	164	92%
5 Menjibi	12	12	100%	7	7	100%	3	1	33%	22	20	91%
6 Kupinesa	16	16	100%	38	38	100%	32	6	19%	86	60	70%
7 Wambur	43	43	100%	81	81	100%	16	5	31%	140	129	92%
Sub-total	394	397	101%	307	309	101%	182	36	20%	883	742	84%
Mongar District												
8 Chali	54	70	130%	100	116	116%	50	10	20%	204	196	96%
9 Karbithang	10	10	100%	0	0	-	0	0	-	10	10	100%
10 Karibee	0	0	-	22	36	164%	15	3	20%	37	39	105%
11 Masangdaza	16	16	100%	39	61	156%	0	0	-	55	77	140%
12 Pangsiibi	0	0	-	18	18	100%	5	2	40%	23	20	87%
13 Gyelposhing	38	22	58%	4	5	125%	0	0	-	42	27	64%
14 Kalapang	0	0	0%	9	11	122%	5	3	60%	14	14	97%
15 Yadi	29	39	134%	77	119	155%	30	6	20%	136	164	121%
16 Chaskhar	46	50	109%	186	296	159%	73	18	25%	305	364	119%
Sub-total	193	207	107%	455	662	145%	178	42	24%	826	911	110%
Grand Total	587	604	103%	762	971	127%	360	78	22%	1,709	1,653	97%

Table IV.2.6 STATISTICAL DATA ON CULTIVATED AREA, PRODUCTION AND YIELD
IN THE STUDY AREA

Crop	Wet land (ha)	Dry land (ha)	Tsheri land (ha)	Other* land (ha)	Total area (ha)	Total Production (ton)	Unit Yield (ton/ha)
LHUNTSHI DISTRICT							
Total net area	839	1,943	758	93	3,633		
Cereals							
Paddy	772	0	0	0	772	772	1.0
Maize	0	1,360	200	0	1,560	1,385	0.9
Wheat	478	53	0	0	531	531	1.0
Barley	0	80	0	0	80	40	0.5
Buckwheat	0	80	0	0	80	30	0.4
Millet	0	200	0	0	200	100	0.5
total	1,250	1,773	200	0	3,223	2,858	
Legumes							
Soyabean	0	400	0	0	400	200	0.5
Others	0	40	0	0	40	10	0.3
total	0	440	0	0	440	210	
Oil seed							
Mustard	12	40	20	0	72	18	0.3
Vegetables							
Potato	20	60	40	16	136	1,000	7.4
Chilli	0	320	80	20	420	300	0.7
Others	4	10	0	40	54	40	0.7
total	24	390	120	76	610	1,340	
Total	1,286	2,643	340	76	4,345	4,426	
MONGAR DISTRICT							
Total net area	527	2,896	2,454	88	5,965		
Cereals							
Paddy	543	0	0	0	543	815	1.5
Maize	20	3,456	30	0	3,506	7,013	2.0
Wheat	8	172	0	0	180	180	1.0
Barley	0	240	0	0	240	222	0.9
Buckwheat	16	60	0	0	76	86	1.1
Millet	0	20	120	0	140	144	1.0
total	587	3,948	150	0	4,685	8,460	
Legumes							
Soyabean	0	240	0	0	240	180	0.8
Others	0	144	0	0	144	108	0.8
total	0	384	0	0	384	288	
Oil seed							
Mustard	0	200	0	0	200	175	0.9
Vegetables							
Potato	0	360	0	0	360	3,150	8.8
Chilli	0	144	0	0	144	270	1.9
Others	0	220	0	0	220	275	1.3
total	0	724	0	0	724	3,695	
Total	587	5,256	150	0	5,993	12,618	
STUDY AREA							
Total net area	1,366	4,839	3,212	181	9,598		
Cereals							
Paddy	1,315	0	0	0	1,315	1,587	1.2
Maize	20	4,816	230	0	5,066	8,398	1.7
Wheat	486	225	0	0	711	711	1.0
Barley	0	320	0	0	320	262	0.8
Buckwheat	16	140	0	0	156	116	0.7
Millet	0	220	120	0	340	244	0.7
total	1,837	5,721	350	0	7,908	11,318	
Legumes							
Soyabean	0	640	0	0	640	380	0.6
Others	0	184	0	0	184	118	0.6
total	0	824	0	0	824	498	
Oil seed							
Mustard	12	240	20	0	272	193	0.7
Vegetables							
Potato	20	420	40	16	496	4,150	8.4
Chilli	0	464	80	20	564	570	1.0
Others	4	230	0	40	274	315	1.1
total	24	1,114	120	76	1,334	5,035	
Total	1,873	7,899	490	76	10,338	17,044	

Source : Lhuntshi and Mongar Districts

* : Others includes orchard and kitchen garden

Table IV.2.7 ESTIMATED CROP PRODUCTION IN THE STUDY AREA

District	Crop	Wet land (ha)	Dry land (ha)	Tsheri land (ha)	Total area (ha)	Total Production (ton)	Unit*1 Yield (ton/ha)
I. LHUNTSHI DISTRICT							
	Total net area	1,190	1,820	700	3,710		
	Paddy	1,190	0	0	1,190	1,430	1.2
	Maize	0	1,220	130	1,350	2,300	1.7
	Wheat	10	50	10	70	70	1.0
	Barley	0	70	0	70	60	0.8
	Buckwheat	0	90	0	90	60	0.7
	Millet	0	200	0	200	140	0.7
	Soyabean	0	340	20	360	220	0.6
	Mustard	0	40	0	40	30	0.7
	Potato	0	50	0	50	420	8.4
	Chilli	0	320	0	320	320	1.0
	Total	1,200	2,380	160	3,740		
II. MONGAR DISTRICT							
	Total net area	910	3,920	3,290	8,120		
	Paddy	830	0	0	830	1,000	1.2
	Maize	80	4,020	700	4,800	8,160	1.7
	Wheat	0	200	80	280	280	1.0
	Barley	0	250	0	250	200	0.8
	Buckwheat	70	100	0	170	120	0.7
	Millet	0	20	0	20	10	0.7
	Soyabean	0	220	0	220	130	0.6
	Mustard	0	230	0	230	160	0.7
	Potato	0	260	0	260	2,180	8.4
	Chilli	0	90	0	90	90	1.0
	Total	1,890	9,310	4,070	15,270		
III. STUDY AREA							
	Total net area	2,100	5,740	3,990	11,830		
	Paddy	2,020	0	0	2,020	2,430	1.2
	Maize	80	5,240	830	6,150	10,460	1.7
	Wheat	10	250	90	350	350	1.0
	Barley	0	320	0	320	260	0.8
	Buckwheat	70	190	0	260	180	0.7
	Millet	0	220	0	220	150	0.7
	Soyabean	0	560	20	580	350	0.6
	Mustard	0	270	0	270	190	0.7
	Potato	0	310	0	310	2,600	8.4
	Chilli	0	410	0	410	410	1.0
	Total	2,180	7,770	940	10,890		

*1 Unit yields of crops are the average yields of statistical data, mentioned in Table IV. 2.6.

**Table IV.2.8 NUMBER OF LIVESTOCK AND POULTRY
IN THE STUDY AREA**

	Districts			
	Lhuntshi		Mongar	
	Head	(%)	Head	(%)
Cattle				
Local Varieties	15,042	96	30,819	99
Improved Varieties	581	4	322	1
Total	15,623	100	31,141	100
Yak	276	-	-	-
Bufalow	-	-	-	-
Sheep				
Local Varieties	391	80	140	100
Improved Varieties	99	20	-	-
Total	490	100	140	100
Goat	-	9	-	-
Horse				
Local Varieties	1,087	96	1,530	99
Improved Varieties	42	4	17	1
Total	1,129	100	1,547	100
Pigs				
Local Varieties	3,054	99	6,518	99
Improved Varieties	39	1	89	1
Total	3,093	100	6,607	100
Poultry				
Local Varieties	7,696	94	14,272	93
Improved Varieties	532	6	1,063	7
Total	8,228	100	15,335	100

Source: District (Dzongkhag) Administration

Table IV.2.9 LIVESTOCK AND POULTRY PRODUCTIVITY (1/2)

Item	Unit	Cattle		Pigs		Horses	
		Local (Siri)	Improved	Local	Improved	Local	Improved
1. Age at puberty	Month	36	24	16	10	36	26
2. Age at first parturition	Year	4	3	2	1	4	3.5
3. Average number of young per parturition	No.	1	1	7-8	10-12	1	1
4. Interparturition period	Month	24	14	6	-	24	-
5. Adult live-weight	kg						
- Male		350	450	60	80	400	500
- Female		275	400	55	90	400	450
6. Adult dressed weight	kg						
- Male		195	-	45	60	-	-
- Female		130	-	42	65	-	-
7. Feed requirement	kg/day						
(Dry matter)		4.5	5	-	-	-	-
- Calves		6.0	6.8	-	-	-	-
- Heifers		10.5	13.5	-	-	-	-
- Bulls							
8. Milk production							
- Yield	kg/year	300	900	-	-	-	-
- Butter fat content	%	4.0-4.5	4.5-6.0	-	-	-	-

Source: Mongar Animal Husbandry Farm, 1988.

Table IV.2.9 LIVESTOCK AND POULTRY PRODUCTIVITY (2/2)

Item	Unit	Chicken	
		Local	Improved
1. Age of maturity	Month	8-9	6-7
2. Egg production	No./year	150	200-225
3. Average egg weight	gram	35-40	50-55
4. Mature live-weight	kg	0.75-1.0	1.0-1.25
5. Carcass weight	kg	0.5-0.75	0.75-1.0
6. Dressing-out percentage	%	25	25

Source: Mongar Animal Husbandry Farm, 1988

Table IV.2.10 EXISTING MILLS IN THE STUDY AREA (1/2)
(LHUNTSHI DISTRICT)

Block	Rice Mill		Oil Mill	
	Number	Total Capacity (ton/year)	Number	Total Capacity (ton/year)
1 Dungkhar	2	300	-	-
2 Gangzoor	6	900	-	-
3 Khoma	2	300	-	-
4 Minji	4	600	-	-
5 Tangmachhu	8	1,200	-	-
6 Metsho	-	-	-	-
7 Jarrey	1	150	-	-
8 Chengkhar	4	600	-	-
Total	27	4,050	-	-

Note : Annual capacity of a rice mill is estimated about 150 ton on the basis following assumptions ;
 - Milling capacity / hour ; 150 Kg
 - Operational hours / day ; 5 hours
 - Annual workable days / year ; 200 days

Table IV.2.10 EXISTING MILLS IN THE STUDY AREA (2/2)
(MONGAR DISTRICT)

Block	Rice Mill		Oil Mill	
	Number	Total Capacity (ton/year)	Number	Total Capacity (ton/year)
1 Chakaling	6	900	-	-
2 Chamang	-	-	-	-
3 Chaskhar	-	-	-	-
4 Demchi	5	750	-	-
5 Ngatshang	4	600	1	15
6 Gongdu	-	-	-	-
7 Kengkhar	-	-	-	-
8 Mongar	5	750	1	15
9 Salling	3	450	-	-
10 Silambi	-	-	-	-
11 Thangrong	-	-	-	-
Total	23	3,450	2	30

Note : Annual capacity of a oil mill is estimated about 15 ton on the basis following assumptions ;
 - Milling capacity / hour ; 30 Kg
 - Operational hours / day ; 5 hours
 - Annual workable days / year ; 100 days

Table IV.2.11 PRESENT FARM ECONOMY OF AVERAGE SIZE FARMERS
IN THE STUDY AREA

Item	Lhuntshi Project Area			Mongar Project Area		
I. Average Farm Size (ha)						
-Wet Land		0.7		0.3		
-Dry Land		0.6		0.6		
-Tshery Land		0.3		0.2		
-Others		0.1				
Total		1.7		1.1		
II. Crop Production						
	Area (ha)	Yield (t/ha)	Production (t)	Area (ha)	Yield (t/ha)	Production (t)
-Paddy	0.70	2.90	2.03	0.27	1.50	0.41
-Maize	0.66	1.90	1.25	0.69	2.00	1.38
-Wheat	0.01	0.50	0.02	0.01	1.00	0.01
-Buckwheat	-	-	-	0.06	0.90	0.05
-Barley	-	-	-	0.18	0.90	0.16
-Soybeans *	0.37	0.70	0.26	-	-	-
-Others	0.06	-	-	-	-	-
Total	1.43			1.21		
III. Cropping Intensity						
	84%			110%		
IV. Crop Production Value (Nu)						
			10,940			5,320
V. Farm Income						
-Crops			980			130
-Livestocks			1,270			730
-Others			-			60
Total (V)			2,250			920
* Commercial Rate of Crops (%)						
(Crop Income / IV)			9			2
VI. Non-Farm Income (Nu)						
-Government Employment			270			320
-Others			360			440
Total (VI)			630			760
VII. Total Income (Nu)						
(VII = V + VI)			2,880			1,680
VIII. Living Expenses (Nu)						
-Foods			630			600
-Clothes			1,060			510
-Fuel			140			130
-Others			1,010			440
Total (VIII)			2,840			1,680
IX. Net Reserve (Nu)						
(VII - VIII)			40			0

Note : *; Intercropped with maize.

Table IV.2.12 POPULATION AND HOUSEHOLDS IN THE MODEL PROJECT AREA (1/2)
(TANGMACHHU)

Village	Wet Land Owner		Dry Land Owner		Landless Farmer		Absent Land Owner		Total
	No. of Population Household	No. of Population Household	No. of Population Household	No. of Population Household	No. of Population Household	No. of Population Household	No. of Population Household	No. of Population Household	
(1) Nebi	42	402	3	43	3	15	0	48	460
(2) Peri	1	11	0	0	2	12	0	3	23
(3) Yongri	1	15	0	0	0	0	0	1	15
(4) Dosagang	0	0	1	37	5	56	0	6	93
(5) Takila	2	16	0	0	4	36	0	6	52
(6) Khandar	20	203	4	13	2	8	0	26	224
(7) Tungkhar	3	26	0	0	0	0	0	3	26
(8) Khasaling	14	86	0	0	3	13	0	17	99
(9) Kusumphei	8	53	1	12	0	0	0	9	65
(10) Gorgan	11	120	3	16	0	0	8	22	192
(11) Baming Dangsha	11	102	0	0	0	0	0	11	102
(12) Tangmachhu	9	83	0	0	0	0	11	20	188
(13) Domashong	32	104	2	14	0	0	0	34	118
(14) Sangtong	2	17	0	0	0	0	0	2	17
(15) Fakidung	36	370	0	0	0	0	10	46	433
(16) Thinlay Pang	1	10	0	0	0	0	0	1	10
(17) Larjeep	0	0	0	0	4	16	0	4	16
(18) Murmo	5	109	0	0	0	0	0	5	109
(19) Ngunmaling	12	350	0	0	0	0	0	12	350
(20) Bushong	6	59	0	0	0	0	0	6	59
Total	216	2,136	14	135	23	156	29	224	2,651

	Wet Land Owner	Dry Land Owner	Landless Farmer	Total
Total Population	2,136	135	156	2,427
Total Household	216	14	23	253
Family Size	9.9	9.6	6.8	9.6

Source : Population census and land registered record in Tangmachhu Block.

Table IV.2.12 POPULATION AND HOUSEHOLDS IN THE MODEL PROJECT AREA (2/2)
(MASANGDAZA)

Village	Wet Land Owner		Dry Land Owner		Landless Farmer		Absent Land Owner		Total	
	No. of Household	Population	No. of Household	Population	No. of Household	Population	No. of Household	Population		
(1) Karibee	13	119	5	38	3	21	2	0	23	178
(2) Karibithang	0	0	0	0	0	0	3	0	3	0
(3) Masangdaza	33	150	4	18	0	0	2	0	39	168
(4) Bongdima	8	78	0	0	0	0	11	0	19	78
(5) Pangsiabi	19	69	2	5	0	0	0	0	21	74
Total	73	416	11	61	3	21	18	0	105	498

	Wet Land Owner	Dry Land Owner	Landless Farmer	Total
Total Population	416	61	21	498
Total Household	73	11	3	87
Family Size	5.7	5.5	7.0	5.7

Source : Population census and land registered record in Salling Block.

Table IV.2.13 POPULATION DISTRIBUTION BY AGE AND SEX
IN THE MODEL PROJECT AREA (1/2)
(TANGMACHHU)

Age Group	Population			Percentage Distribution (%)		
	Male	Female	Total	Male	Female	Total
0 - 4	56	48	104	4.71	3.88	4.29
5 - 9	126	158	284	10.60	12.76	11.70
10 - 14	147	151	298	12.36	12.20	12.28
15 - 19	92	81	173	7.74	6.54	7.13
20 - 24	92	84	176	7.74	6.79	7.25
25 - 29	103	110	213	8.66	8.89	8.78
30 - 34	100	92	192	8.41	7.43	7.91
35 - 39	70	62	132	5.89	5.01	5.44
40 - 44	107	92	199	9.00	7.43	8.20
45 - 49	111	140	251	9.34	11.31	10.34
50 - 54	55	73	128	4.63	5.90	5.27
55 - 59	96	114	210	8.07	9.21	8.65
60 - 64	23	22	45	1.93	1.77	1.85
65 -	11	11	22	0.92	0.88	0.91
Total	1,189 (48.99%)	1,238 (51.01%)	2,427 (100.00%)	100.00	100.00	100.00

Note: Population distribution data are based on the result of demographic survey in Tangmachhu model project area.

Table IV.2.13 POPULATION DISTRIBUTION BY AGE AND SEX
IN THE MODEL PROJECT AREA (2/2)
(MASANGDAZA)

Age Group	Population			Percentage Distribution (%)		
	Male	Female	Total	Male	Female	Total
0 - 4	35	19	54	12.59	8.64	10.84
5 - 9	39	32	71	14.03	14.55	14.26
10 - 14	39	23	62	14.03	10.45	12.45
15 - 19	28	24	52	10.07	10.91	10.44
20 - 24	30	19	49	10.79	8.64	9.84
25 - 29	11	19	30	3.96	8.64	6.02
30 - 34	21	11	32	7.55	5.00	6.43
35 - 39	17	17	34	6.12	7.73	6.83
40 - 44	7	8	15	2.52	3.64	3.01
45 - 49	16	17	33	5.76	7.73	6.63
50 - 54	15	12	27	5.40	5.45	5.42
55 - 59	10	8	18	3.60	3.64	3.61
60 - 64	2	7	9	0.71	3.17	1.81
65 -	8	4	12	2.87	1.81	2.41
Total	278 (55.82%)	220 (44.18%)	498 (100.00%)	100.00	100.00	100.00

Note: Population distribution data are based on the result of demographic survey in Masangdaza model project area consisting of Karbithang, Karibee, Masangdaza including Bongdima, and Pangsihi.

Table IV.2.14 LAND HOLDING STATUS BY OWNERSHIP
IN THE MODEL PROJECT AREA (1/2)
(TANGMACHHU)

Item	Wet Land Owner	Dry Land Owner	Absent Land Owner	Landless Farmer	Total
No. of Household	216	14	29	(23)	282 (259) (23)
Land Holding (ha)					
-Wet Land	188	0	36	0	224
-Dry Land	108	2	4	0	114
-Tsheri	93	2	0	0	95
-Others	42	3	0	0	45
Total	431	7	40	0	478
Average Holding Size					/_1
-Wet Land	0.87	0	1.24	0	0.86
-Dry Land	0.50	0.14	0.14	0	0.44
-Tsheri	0.43	0.14	0	0	0.37
-Others	0.19	0.21	0	0	0.17
Total	1.99	0.49	1.38	0	1.84

/_1 : Land holding size divided by the number of land owner ; excluding
the number of landless farmer.

Table IV.2.14 LAND HOLDING STATUS BY OWNERSHIP
IN THE MODEL PROJECT AREA (2/2)
(MASANGDAZA)

Item	Wet Land Owner	Dry Land Owner	Absent Land Owner	Landless Farmer	Total
No. of Household	73	11	18	(3)	105 (102) (3)
Land Holding (ha)					
-Wet Land	19	0	11	0	30
-Dry Land	68	10	3	0	81
-Tsheri	2	1	0	0	3
-Others	0	0	9	0	9
Total	89	11	23	0	123
Average Holding Size					/_1
-Wet Land	0.26	0	0.61	0	0.29
-Dry Land	0.93	0.91	0.17	0	0.79
-Tsheri	0.03	0.09	0	0	0.03
-Others	0	0	0.50	0	0.09
Total	1.22	1.00	1.28	0	1.20

/_1 : Land holding size divided by the number of land owner ; excluding
the number of landless farmer.

Table IV.2.15 LAND HOLDING STATUS BY SIZE IN THE MODEL PROJECT AREA (1/2)
(TANGMACHHU)

Land Holding Size (ha)	Wet Land			Dry Land			Wet/Dry Land Total			Tseri Land		
	Number	Area (ha)	Average Size (ha)	Number	Area (ha)	Average Size (ha)	Number	Area (ha)	Average Size (ha)	Number	Area (ha)	Average Size (ha)
0	14	0.00	0.00	70	0.00	0.00	7	0.00	0.00	161	0.00	0.00
~ 0.2	20	2.45	0.12	43	5.41	0.13	12	1.58	0.13	20	2.25	0.11
0.2 ~ 0.4	40	12.48	0.31	52	15.02	0.29	26	7.68	0.30	20	6.00	0.30
0.4 ~ 0.6	45	22.59	0.50	34	17.21	0.51	26	12.89	0.50	13	6.29	0.48
0.6 ~ 0.8	29	20.20	0.70	18	12.18	0.68	36	24.55	0.68	9	5.98	0.66
0.8 ~ 1.0	26	23.44	0.90	8	7.24	0.91	14	12.52	0.89	15	12.90	0.86
1.0 ~ 1.2	28	30.79	1.10	9	10.00	1.11	21	23.02	1.10	4	4.54	1.14
1.2 ~ 1.4	10	13.12	1.31	9	11.81	1.31	25	32.75	1.31	3	3.86	1.29
1.4 ~ 1.6	19	28.12	1.48	4	5.98	1.50	14	21.05	1.50	1	1.53	1.53
1.6 ~ 1.8	3	5.03	1.68	2	3.26	1.63	16	26.87	1.68	1	1.77	1.77
1.8 ~ 2.0	8	14.80	1.85	3	5.63	1.88	18	33.96	1.89	2	3.76	1.88
2.0 ~ 2.2	2	3.99	2.00	1	2.00	2.00	10	20.80	2.08	2	4.27	2.14
2.2 ~ 2.4	4	8.83	2.21	3	6.72	2.24	3	7.10	2.37	0	0.00	0.00
2.4 ~ 2.6	0	0.00	0.00	0	0.00	0.00	7	17.32	2.47	0	0.00	0.00
2.6 ~ 2.8	4	10.55	2.64	0	0.00	0.00	4	10.83	2.71	0	0.00	0.00
2.8 ~ 3.0	0	0.00	0.00	0	0.00	0.00	4	11.59	2.90	0	0.00	0.00
3.0 ~ 3.2	0	0.00	0.00	1	3.01	3.01	2	6.23	3.12	1	3.17	3.17
3.2 ~ 3.4	0	0.00	0.00	0	0.00	0.00	2	6.70	3.35	1	3.33	3.33
3.4 ~ 3.6	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	3.46	3.46
3.6 ~ 3.8	4	14.52	3.63	0	0.00	0.00	3	11.07	3.69	0	0.00	0.00
3.8 ~ 4.0	2	7.80	3.90	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.0 ~ 4.2	0	0.00	0.00	2	8.27	4.14	0	0.00	0.00	1	4.01	4.01
4.2 ~ 4.4	0	0.00	0.00	0	0.00	0.00	1	4.39	4.39	1	4.27	4.27
4.4 ~ 4.6	0	0.00	0.00	0	0.00	0.00	1	4.51	4.51	0	0.00	0.00
4.6 ~ 4.8	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.8 ~ 5.0	0	0.00	0.00	0	0.00	0.00	2	9.77	4.89	0	0.00	0.00
Above 5.0	1	5.92	5.92	0	0.00	0.00	5	31.19	6.24	3	23.92	7.97
Total	259	224.63	0.87	259	113.74	0.44	259	338.37	1.31	259	95.31	0.37

Land Holding Size (ha)	Fallow			Home Garden / Others			Total		
	Number	Area (ha)	Average Size (ha)	Number	Area (ha)	Average Size (ha)	Number	Area (ha)	Average Size (ha)
0	189	0.00	0.00	135	0.00	0.00	0	0.00	0.00
~ 0.2	25	3.00	0.12	89	7.19	0.08	16	2.05	0.13
0.2 ~ 0.4	25	7.16	0.29	32	8.52	0.27	14	4.11	0.29
0.4 ~ 0.6	10	5.19	0.52	2	0.90	0.45	19	9.29	0.49
0.6 ~ 0.8	3	2.03	0.68	1	0.72	0.72	33	22.94	0.70
0.8 ~ 1.0	5	4.52	0.90	0	0.00	0.00	12	10.97	0.91
1.0 ~ 1.2	0	0.00	0.00	0	0.00	0.00	16	17.77	1.11
1.2 ~ 1.4	0	0.00	0.00	0	0.00	0.00	30	38.88	1.30
1.4 ~ 1.6	0	0.00	0.00	0	0.00	0.00	11	16.47	1.50
1.6 ~ 1.8	0	0.00	0.00	0	0.00	0.00	8	13.60	1.70
1.8 ~ 2.0	0	0.00	0.00	0	0.00	0.00	19	36.04	1.90
2.0 ~ 2.2	1	2.10	2.10	0	0.00	0.00	13	27.00	2.08
2.2 ~ 2.4	0	0.00	0.00	0	0.00	0.00	10	22.47	2.25
2.4 ~ 2.6	0	0.00	0.00	0	0.00	0.00	6	14.76	2.46
2.6 ~ 2.8	0	0.00	0.00	0	0.00	0.00	10	26.91	2.69
2.8 ~ 3.0	0	0.00	0.00	0	0.00	0.00	4	11.53	2.88
3.0 ~ 3.2	1	3.03	3.03	0	0.00	0.00	9	28.07	3.12
3.2 ~ 3.4	0	0.00	0.00	0	0.00	0.00	5	16.59	3.32
3.4 ~ 3.6	0	0.00	0.00	0	0.00	0.00	1	3.58	3.58
3.6 ~ 3.8	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
3.8 ~ 4.0	0	0.00	0.00	0	0.00	0.00	1	3.95	3.95
4.0 ~ 4.2	0	0.00	0.00	0	0.00	0.00	2	8.13	4.07
4.2 ~ 4.4	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.4 ~ 4.6	0	0.00	0.00	0	0.00	0.00	2	9.07	4.54
4.6 ~ 4.8	0	0.00	0.00	0	0.00	0.00	1	4.62	4.62
4.8 ~ 5.0	0	0.00	0.00	0	0.00	0.00	2	9.88	4.94
Above 5.0	0	0.00	0.00	0	0.00	0.00	15	119.36	7.96
Total	259	27.03	0.10	259	17.33	0.07	259	478.04	1.85

Table IV.2.15 LAND HOLDING STATUS BY SIZE IN THE MODEL PROJECT AREA (2/2)
(MASANGDAZA)

Land Holding Size (ha)	Wet Land			Dry Land			Wet/Dry Land Total			Tsheri		
	Number	Area (ha)	Average Size (ha)	Number	Area (ha)	Average Size (ha)	Number	Area (ha)	Average Size (ha)	Number	Area (ha)	Average Size (ha)
0	24	0.00	0.00	16	0.00	0.00	11	0.00	0.00	91	0.00	0.00
~ 0.2	43	3.85	0.09	5	0.51	0.10	2	0.23	0.12	5	0.48	0.10
0.2 ~ 0.4	19	4.85	0.26	2	0.40	0.20	3	0.68	0.23	4	1.02	0.26
0.4 ~ 0.6	7	3.14	0.45	9	4.49	0.50	3	1.39	0.46	2	1.10	0.55
0.6 ~ 0.8	1	0.61	0.61	11	7.51	0.68	3	2.02	0.67	0	0.00	0.00
0.8 ~ 1.0	2	1.60	0.80	12	10.14	0.85	18	14.90	0.83	0	0.00	0.00
1.0 ~ 1.2	3	3.60	1.20	29	31.49	1.09	10	11.04	1.10	0	0.00	0.00
1.2 ~ 1.4	0	0.00	0.00	9	11.16	1.24	34	41.40	1.22	0	0.00	0.00
1.4 ~ 1.6	2	3.00	1.50	2	3.03	1.52	3	4.61	1.54	0	0.00	0.00
1.6 ~ 1.8	0	0.00	0.00	4	6.46	1.62	10	16.41	1.64	0	0.00	0.00
1.8 ~ 2.0	0	0.00	0.00	2	3.68	1.84	1	1.96	1.96	0	0.00	0.00
2.0 ~ 2.2	0	0.00	0.00	0	0.00	0.00	1	2.19	2.19	0	0.00	0.00
2.2 ~ 2.4	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
2.4 ~ 2.6	0	0.00	0.00	0	0.00	0.00	1	2.46	2.46	0	0.00	0.00
2.6 ~ 2.8	0	0.00	0.00	1	2.68	2.68	0	0.00	0.00	0	0.00	0.00
2.8 ~ 3.0	0	0.00	0.00	0	0.00	0.00	1	2.91	2.91	0	0.00	0.00
3.0 ~ 3.2	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
3.2 ~ 3.4	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
3.4 ~ 3.6	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
3.6 ~ 3.8	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
3.8 ~ 4.0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.0 ~ 4.2	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.2 ~ 4.4	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.4 ~ 4.6	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.6 ~ 4.8	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.8 ~ 5.0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
Above 5.0	1	9.60	9.60	0	0.00	0.00	1	9.60	9.60	0	0.00	0.00
Total	102	30.25	0.30	102	81.55	0.80	102	111.80	1.10	102	2.60	0.03

Land Holding Size (ha)	Fallow			Home Garden / Others			Total		
	Number	Area (ha)	Average Size (ha)	Number	Area (ha)	Average Size (ha)	Number	Area (ha)	Average Size (ha)
0	91	0.00	0.00	102	0.00	0.00	0	0.00	0.00
~ 0.2	0	0.00	0.00	0	0.00	0.00	1	0.10	0.10
0.2 ~ 0.4	0	0.00	0.00	0	0.00	0.00	4	0.88	0.22
0.4 ~ 0.6	0	0.00	0.00	0	0.00	0.00	3	1.39	0.46
0.6 ~ 0.8	0	0.00	0.00	0	0.00	0.00	2	1.40	0.70
0.8 ~ 1.0	11	8.80	0.80	0	0.00	0.00	29	23.70	0.82
1.0 ~ 1.2	0	0.00	0.00	0	0.00	0.00	7	7.69	1.10
1.2 ~ 1.4	0	0.00	0.00	0	0.00	0.00	36	44.16	1.23
1.4 ~ 1.6	0	0.00	0.00	0	0.00	0.00	3	4.56	1.52
1.6 ~ 1.8	0	0.00	0.00	0	0.00	0.00	11	17.97	1.63
1.8 ~ 2.0	0	0.00	0.00	0	0.00	0.00	2	3.81	1.91
2.0 ~ 2.2	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
2.2 ~ 2.4	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
2.4 ~ 2.6	0	0.00	0.00	0	0.00	0.00	2	5.03	2.52
2.6 ~ 2.8	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
2.8 ~ 3.0	0	0.00	0.00	0	0.00	0.00	1	2.91	2.91
3.0 ~ 3.2	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
3.2 ~ 3.4	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
3.4 ~ 3.6	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
3.6 ~ 3.8	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
3.8 ~ 4.0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.0 ~ 4.2	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.2 ~ 4.4	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.4 ~ 4.6	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.6 ~ 4.8	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
4.8 ~ 5.0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
Above 5.0	0	0.00	0.00	0	0.00	0.00	1	9.60	9.60
Total	102	8.80	0.09	102	0.00	0.00	102	123.20	1.21

Table IV. 2.16 NUMBER OF LIVESTOCK AND POULTRY
IN THE MODEL PROJECT AREA

Item	Cattle	Horse	Pig	Poultry
I. Tangmachhu.				
1. No. of Livestock and Poultry				
- Young (0-3 year)	770	60	397	692
- Adult (3-year)	771	101	132	274
Total	1,541	161	529	966
2. No. of Household	----- 253 -----			
3. Average Holding (1/2)	6.1	0.6	2.1	3.8
II. Masangdaza				
1. No. of Livestock and Poultry				
- Young (0-3 year)	241	19	66	126
- Adult (3-year)	406	40	26	227
Total	647	59	92	353
2. No. of Household	----- 87 -----			
3. Average Holding (1/2)	7.4	7.0	1.1	4.1

Source: Estimation based on the data, which are collected from Animal Husbandry Farm in Lingmethang, Mongar and the veterinary center in Tangmachhu, and the result of farm economic survey.

Table IV.2.17 RESULTS OF FARM ECONOMIC SURVEY

(1) Basic Data

Farm Size (ha)	No. of Sampling Farmers	Average Family Size (Persons)	Average Land Holding (ha)			Livestock/Poultry Holding			
			Net Land	Dry Land	Total	Cattle	Horses	Pigs	Poultry
I. Tangmachhu									
Below 0.59	10	6.4	0.25	0.16	0.41	3.1	0.4	2.1	3.4
0.59 - 1.08	19	7.3	0.64	0.19	0.83	6.0	0.7	2.3	4.3
1.08 - 1.74	5	9.2	1.07	0.29	1.36	12.8	1.0	2.6	5.2
Over 1.74	6	12.3	2.20	0.60	2.80	10.0	0.7	2.2	4.7
Average	(40)	8.1	0.83	0.26	1.09	6.7	0.7	2.3	4.2
II. Masangdaza									
Below 0.80	8	4.1	0.14	0.42	0.56	6.9	1.4	1.3	2.9
0.80 - 1.20	9	5.4	0.17	0.68	0.86	5.4	0.1	0.8	4.7
1.20	3	5.7	0.11	1.09	1.20	9.0	1.0	1.7	3.3
Over 1.20	9	6.9	0.38	1.38	1.76	10.3	0.6	1.2	5.1
Average	(29)	5.6	0.22	0.86	1.08	7.7	0.7	1.1	4.2

(2) Disposal of Farm Products

Farm Size (ha)	Share of Disposition of Farm Products (%)										Consumption (kg) Per Capita Cereals					
	Paddy					Maize					Paddy	Maize	Others	Total		
	Food	Alcohol	Seed	Sold	Others	Food	Alcohol	Seed	Sold	Others						
I. Tangmachhu																
Below 0.59	86.3	0.1	2.7	4.0	6.9	100.0	90.4	6.5	3.1	0	0	100.0	187 (51)	35	6	228
0.59 - 1.08	82.1	0.9	2.6	13.7	0.7	100.0	85.0	7.6	4.2	0	3.2	100.0	215 (12)	39	11	265
1.08 - 1.74	90.5	4.4	1.6	3.2	0.3	100.0	83.3	13.4	3.3	0	0	100.0	205	40	7	252
Over 1.74	74.3	2.3	2.7	17.9	2.8	100.0	92.1	3.5	4.4	0	0	100.0	215	36	6	257
Average	82.0	1.8	2.5	11.7	2.0	100.0	87.1	7.5	4.0	0	1.4	100.0	212 (15)	39	9	260
II. Masangdaza																
Below 0.80	83.2	0	2.1	0	14.7	100.0	74.1	9.7	2.5	5.2	8.5	100.0	60 (10)	148	14	212
0.80 - 1.20	89.8	0	2.3	1.3	6.6	100.0	83.0	6.5	2.3	1.2	7.0	100.0	57 (16)	292	2	352
1.20	90.0	0	2.0	0	8.0	100.0	85.0	9.1	4.1	0	1.8	100.0	32	275	10	317
Over 1.20	75.9	0	2.3	7.2	14.6	100.0	69.2	8.9	2.7	9.0	10.2	100.0	96 (17)	283	3	371
Average	81.0	0	2.3	4.3	12.4	100.0	74.8	8.5	2.8	5.7	8.2	100.0	71 (13)	230	6	307

*: () ; Purchased paddy out of total paddy consumption.

(3) Living Expenses (Cash Outgo)

Farm Size (ha)	Share of Living Expenses (%)										
	Foods					Transport					
	Rice	Salt	Oil	Others	Total	Clothing	Fuel	Cost	Ceremony	Others	Total
I. Tangmachhu											
Below 0.59	43.0	4.9	7.1	7.0	62.0	19.7	3.6	0.4	9.9	4.4	100.0
0.59 - 1.98	8.4	3.2	7.9	9.5	29.0	37.6	11.4	2.5	8.6	10.9	100.0
1.08 - 1.74	0	2.2	3.5	3.3	9.0	32.0	4.4	4.8	25.3	24.5	100.0
Over 1.74	0	2.3	5.1	6.5	13.9	31.1	5.9	3.3	20.0	25.8	100.0
Average	10.6	3.1	6.3	7.1	27.1	32.2	7.6	2.8	14.6	15.7	100.0
II. Masangdaza											
Below 0.80	14.5	8.7	0	2.0	25.2	38.2	1.5	0	6.7	28.4	100.0
0.80 - 1.20	23.9	6.2	28.7	5.0	63.8	20.8	1.0	0	11.3	3.1	100.0
1.20	0	15.5	0	4.2	19.7	41.5	0	0	18.7	20.1	100.0
Over 1.20	25.3	7.3	0	4.2	36.8	31.9	3.6	1.0	18.1	8.6	100.0
Average	21.4	7.5	9.4	4.0	42.3	30.1	2.2	0.4	13.4	11.6	100.0

(4) Farm Economy

Farm Size (ha)	Farm Income				Non-Farm Income (Nu) (II)	Total Income (III=I+II)	Living Expenses (IV)	Net Reserve (III-IV)
	Paddy	Maize	Others	Total (I)				
I. Tangmachhu								
Below 0.59	120	0	185	305	1,590	1,895	1,840	55
0.59 - 1.98	745	0	150	895	2,020	2,915	2,520	399
1.08 - 1.74	275	0	3,195	3,470	2,195	5,665	4,910	755
Over 1.74	1,910	0	1,950	3,860	980	4,840	3,590	1,250
Average	705	0	805	1,510	1,775	3,285	2,805	480
II. Masangdaza								
Below 0.80	0	130	160	290	395	685	690	-5
0.80 - 1.20	10	80	125	215	670	885	880	5
1.20	0	0	280	280	225	505	320	185
Over 1.20	155	830	310	1,295	375	1,670	1,100	570
Average	50	315	205	570	455	1,025	840	185

Table IV.2.13 PRESENT LABOUR REQUIREMENT PER HOUSEHOLD IN THE MODEL PROJECT AREA (1/2)
(TANGMACHHU MODEL PROJECT AREA)

Labour Requirement Person/day/household	January			February			March			April			May			June			July			August			September			October			November			December		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd			
Paddy (Wet Land) Man-day/ha	0	0	0	0	0	0	0	0.30	0.30	0.30	0.30	0.30	1.47	1.47	2.31	2.35	2.35	2.60	1.43	1.43	1.43	0.58	0.58	1.38	1.38	1.13	1.13	1.13	1.13	1.13	1.13	0	0	0		
Area (ha)	0	0	0	0	0	0	0	0.27	0.27	0.27	0.27	1.30	1.30	2.06	2.09	2.09	2.31	1.27	1.27	1.27	0.52	0.52	1.23	1.23	1.01	1.01	1.01	1.01	1.01	1.01	0	0	0			
Wheat (Wet Land) Man-day/ha	0.16	0.16	0	0	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0	0	0	0	0	0	0	0	0	0	0.44	0.44	0.51	0.51	0.51	0.67	0.67	0.23	0.23	0.16		
Area (ha)	0	0	0	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0		
Potato (Wet Land) Man-day/ha	0.63	0.63	0.79	0.79	0.16	0.16	0	0	0	0	0	0	0.69	0.69	0.69	0.69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Area (ha)	0.01	0.01	0.01	0.01	0.008	0.008	0	0	0	0	0	0	0.01	0.01	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Maize/Soyabean (Dry Land) Man-day/ha	0	0	0	0	0.51	0.51	0.51	0.51	0.70	0.90	0.90	0.39	0.60	0.60	0.60	0.60	0.41	0.21	0.21	0.57	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0	0	0	0	0	
Area (ha)	0	0	0	0	0.22	0.22	0.22	0.22	0.31	0.40	0.40	0.17	0.27	0.27	0.27	0.27	0.18	0.09	0.09	0.25	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0	0	0	0	0	
Chilli (Dry Land) Man-day/ha	0	0	0	0	0	0	0	0	0.12	0.12	0.12	0.68	1.34	1.34	1.86	1.86	1.74	1.18	1.18	0.53	0.60	0.60	0.60	3.60	3.60	3.07	3.07	0	0	0	0	0	0	0	0	
Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.00	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0	0	0	0	0		
Maize (Dry Land) Man-day/ha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.18	1.18	1.62	0.44	0.44	0.48	0.48	0.48	0.48	0.48	0.48	1.10	1.10	1.10	0	0	0	
Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0.01	0	0	0	0	0	0	0	0	0.01	0.01	0.01	0	0		
Mustard (Dry Land) Man-day/ha	0.46	0.46	0.46	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	0.46	0.46	0.46	
Area (ha)	0.01	0.01	0.01	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	0.01	0.01	0.01	
Maize (Thirt Land) Man-day/ha	0	0	0	0	0.71	0.71	0.97	0.97	0.97	0.97	0.97	0.55	0.29	0.58	0.29	0.29	0.29	0	0	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0	0	0	0	0	
Area (ha)	0	0	0	0	0.11	0.11	0.15	0.15	0.15	0.15	0.15	0.08	0.04	0.09	0.04	0.04	0.04	0	0	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0	0	0	0	0	
Total	0.02	0.02	0.02	0.01	0	0.34	0.34	0.38	0.65	0.73	0.76	0.76	1.54	1.69	2.44	2.42	2.34	2.24	1.55	1.45	1.56	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	1.03	1.03	1.03	0.02	0.02	

Note: Average holding size of farm land in Tangmachhu project area is wet land of 0.89 ha, dry land of 0.45 ha and thirt land of 0.38 ha.

Table IV.2.19 AVAILABLE LABOUR FORCE
IN THE MODEL PROJECT AREA

	Unit	Tangmachhu	Masangdaza
I. Available Labour Force (Age groupe of 15-54 years old)			
(1) Male		730*0.9=657	145*0.9=131
(2) Female		734*0.6=440	127*0.6=76
Total	Person	1,097	207
II. Labour Force per Household			
(1) No. of Household	No.	253	87
(2) Available labour Force per Household	Man-Days /Household	4.33	2.37
III. Labour Requirement other than Wet/Dry Land Cultivation			
(1) Household			
- Family Size	Person	9.6	5.7
- Requirement per household	Man-Days /Household	0.50	0.30
(2) Herding	Man-Days /Household	0.25	0.16
		(90 man-days /365 days)	(60 man-days 365 days)
(3) Duty on Public Works / Private Employments	Man-Days /Household	1.00	0.04
		(20 man-days /month)	(15 man-days /years)
Total	Man-Days /Household	1.75	0.5
IV. Available Labour Force per Household for Wet/Dry Land Cultivation			
	Man-Days /Household	2.58	1.87

Note : Estimation on the basis of field survey.

Table IV.3.1 PROPOSED FARMING PRACTICE (1/5 PADDY)

I. Managenet of Nursery	
1 Type of nursery	: Wet nursery, semi-dry method
2 Amount of seed	: 50 kg / ha
3 Area of nursery bed	: 5 % of planting field (500 sq.m per ha)
4 Sowing	: Seed selection by water
5 Duration of nursery	: 40 days
6 Renewal of seed	: Every four years, renewal to register seed
II. Land Preparation	
1 Starting	: 20 days before transplantiong
2 Animal power	: Double bullock with single operator Improved steel plough
3 1st ploughing	: Under dry condition
4 2nd ploughing	: After applying irrigation water
5 Puddling	: 1 day before transplanting
III. Planting	
1 Planting method	: Line transplanting
2 Planting density	: 20 to 30 hills per sq. m
3 No. of seedlings	: 3 seedling per hill
IV. Application of Fertilizer	
1 Nursery bed	Urea : 5 kg per bed (2.1 kg N)
2 Basal dressing	Urea : 80 kg per ha (36.8 kg N) TSP : 70 kg per ha (29.4kg P2O5) F.M.Y. : 4,000 kg per ha
3 1st top dressing at 30 day after transplanting	Urea : 70 kg per ha (32.2 kg N)
V. Weeding	
1 Method	: Rotary weeder and manual or herbicide at 1 to 2 days after transplanting
2 1st weeding	: At 20 day after transplanting
3 2nd weeding	: At 50 day after transplanting
VI. Applicaation of Agro-chemicals	
1 Application	: On the basis of obserbation
VII. Water Management	
<u>Growing stage</u>	<u>Depth of water</u>
1 Transplanting-rooting	: Deep
2 Most tillering stage	: Shallow with intermitted irrigation
3 Neck-node differenciation -panicle formation	: Midseason drainaige
4 Panicle formation-heading	: Shallow
5 Full ripening-harvesting	: Water drained
VIII. Harvesting, Threshing	
1 Harvesting	: Cutting stem near ground surface by sickle
2 Threshing	: By pedal thresher after drying 1 to 2 days in the field
3 Drying	: By sun light in farm yard to reduce water content less than 14%

Table IV.3.1 PROPOSED FARMING PRACTICE (2/5 MAIZE AND SOYABEAN)

I. Land Preparation	
1 Ploughing	: 2 times 1 time after sowing to cover seed sown
2 Animal power	: Double bullock with single operator Improved steel plough
II. Planting	
1 Planting method	: Line planting
2 Seed rate	: 25 kg / ha for maize 30 kg / ha for soyabean Soyabean seed inoculated
3 Spacing of maize	: 60 cm in rows 20 cm in lines
4 Spacing of soyabean	: 20 cm in rows 5 cm in lines
5 Interval of maize and soyabean	maize : 3 lines Soyabea : 7 lines
III. Application of Fertilizer	
1 Basal dressing for land preparation	F.M.Y. : 4,000 kg per ha
IV. Weeding	
1 Method	: by manual or intertilling
2 1st weeding	: At 30 day after germination
3 2nd weeding	: At 60 day after germination
V. Application of Agro-chemicals	
1 Application	: Application
2 Stem borax for maize	: 1 liter of Nuvacron or Thiodane
3 Cutworm for maize	: 25 kg of Thimet 10 granule
4 Armyworm for maize	: 25 kg of Thimet 10 granule
VI. Harvesting, Threshing	
1 Harvesting	Maize : Removing cobs Soyabean : Picking up the plant
2 Drying	Maize : By sun light in farm yard Soyabean : By sun light in field
3 Threshing	Maize : By maize shellar after drying Soyabean : By hitting with stick

Table IV.3.1 PROPOSED FARMING PRACTICE (3/5 WHEAT)

I. Land Preparation	
1 Ploughing	: 1 time after rain or application of irrigation water or just after harvesting the previous crop
2 Animal power	: Double bullock with single operator
3 After ploughing	: Improved steel plough : Planking by hand
II. Planting	
1 Planting method	: Broadcasting
2 Amount of seed	: 100 to 120 kg per ha
III. Application of Fertilizer	
1 Basal dressing for land preparation	F.M.Y. : 4,000 kg per ha
2 Top dressing at 30 days after germination	Urea : 60 kg per ha (27.6 kg N) (irrigated crop only)
V. Weeding	
1 Method	: Hand weeding
2 Weeding	: At 30 day after germination
VI. Application of Agro-chemicals	
1 Application	: Seed treatment
2 Loose Smut	: 1g of Vitavax for 2 kg seed
V. Water Management	
Irrigation water should be applied not excess to wet soil because wheat is easy to get damage by overwet.	
<u>Growing stage</u>	<u>Depth of water</u>
1 Crown root initiation	: Moist soil by irrigation water
2 Maximum tillering	: Moist soil by irrigation water
3 Panicle initiation	: Moist soil by irrigation water
4 Flowering	: Moist soil by irrigation water
5 Milking stage	: Moist soil by irrigation water
VI. Harvesting, Threshing	
1 Harvesting	: By cutting stem with sickle after full mature
2 Threshing	: By pedal thresher in the field
3 Drying	: By sun light in farm yard to reduce water content less than 14%

Table IV.3.1 PROPOSED FARMING PRACTICE (4/5 MUSTARD)

I. Land Preparation	
1 Ploughing	: 1 time after rain or application of irrigation water or just after harvesting the previous crop
2 Animal power	: Double bullock with single operator Improved steel plough
3 After ploughing	: Planking by hand
II. Planting	
1 Planting method	: Broadcasting or line sowing
2 Amount of seed	: 10 to 12 kg / ha
3 Thinning	: Thinning 5 cm in lines and 30 cm in rows during growth
III. Application of Fertilizer (for irrigated crop only)	
1 Basal dressing before sowing	Urea : 70 kg of urea per ha (32.2 kg N) TSP : 60 kg of TSP per ha (25.5 kg P ₂ O ₅)
IV. Weeding	: Hand weeding
1 Method	: 2 times
2 Weeding time	
V. Application of Agro-chemicals	: On the basis of obserbation
1 Application	: 1 ml/1 lit. of Nuvacron
2 Aphid	
VI. Water Management	: Moist soil when dry
1 Application	
VII. Harvesting, Threshing	: By sickle
1 Harvesting	: after changing pod colour to yellow
2 Threshing	: By beating with stick
3 Drying	: By sun light in farm yard

Table IV.3.1 PROPOSED FARMING PRACTICE (5/5 CHILLI)

I. Managenet of Nursery	
1 Type of nursery	: Dry raise bed nursery
2 Sowing method	: Line sowing
3 Amount of seed	: 1 to 2 kg / ha
4 Duration of nursery	: 5 to 7 weeks after planting
5 Area of nursery	: 5 to 10 % of transplanted area
II. Land Preparation	
1 Ploughing	: 1 times
2 Animal power	: Double bullock with single operator Improved steel plough
3 After ploughing	: Planking by hand
4 Type of field	: Raise bed with 40 cm width
III. Transplanting	
1 Planting method	: Line transplanting
2 Planting density	: 25 to 30 cm interval
IV. Application of Fertilizer	
1 Nursery	: F.M.Y.
2 Basal dressing	Urea : 120 kg of urea per ha (50.4kg N)
before transplanting	TSP : 110 kg of TSP per ha (46.2 kg P2O5)
	F.M.Y. : 4,000 kg of manure per ha
3 Top dressing at one month after transplanting	Urea : 100 kg per ha (42 kg N)
V. Weeding	
1 Method	: Cultivating or intertilling
2 1st weeding	: At 10 to 15 days after transplanting
3 2nd weeding	: At 20 to 30 days after transplanting
4 3rd weeding	: At 30 to 45 days after transplanting (at least)
VI. Application of Agro-chemicals	
1 Application	: On the basis of obserbation
2 Anthracnose	: 2% copper fungicide solution
3 Cutworm	: 25 kg of Thimet 10 granule per ha
VII. Harvesting, Threshing	
1 Harvesting	: By picking pods after changing color to red
2 Drying	: By sun light in farm yard

Table IV.3.2. FUTURE LABOUR REQUIREMENTS IN THE MODEL PROJECT AREA (1/2)
(TANGMACHU MODEL PROJECT AREA)

Crop req- ment	January			February			March			April			May			June			July			August			September			October			November			December					
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd			
Paddy (wet land) Man-day/ha 179 Area 0.87 ha Person/day/household	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.22	0.22	0.75	0.84	1.83	1.87	1.87	2.11	1.54	1.79	0.80	0.30	0.58	0.30	1.57	1.36	1.36	1.27	1.23	1.23	0.00	0.00	0.00	0.00	0.00	0.00
Wheat (wet land) Man-day/ha 58 Area 0.22 ha Person/day/household	0.07	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.04	0.04	1.14	1.14	1.83	1.62	1.59	1.62	1.83	1.34	1.56	0.70	0.51	0.26	1.37	1.18	1.18	1.10	1.07	1.07	0.00	0.00	0.00	0.00	0.00	0.00
Mustard (wet land) Man-day/ha 39 Area 0.22 ha Person/day/household	0.17	0.22	0.22	0.22	0.04	0.04	0.22	0.22	0.22	0.75	0.75	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maize/soyabean (dry land) Man-day/ha 83 Area 0.23 ha Person/day/household	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.42	0.42	0.64	0.64	0.64	0.53	0.53	0.53	0.58	0.58	0.58	0.48	0.48	0.48	0.32	0.28	0.28	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.00	0.00	0.00	0.00	0.00	0.00
Chilli (dry land) Man-day/ha 291 Area 0.23 ha Person/day/household	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.22	0.22	0.86	0.86	0.86	1.84	1.62	1.62	1.69	2.35	2.35	2.35	2.35	2.35	1.37	1.37	4.04	4.04	2.74	2.74	2.74	2.74	2.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wheat (dry land) Man-day/ha 53 Area 0.12 ha Person/day/household	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14	1.14	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mustard (dry land) Man-day/ha 37 Area 0.12 ha Person/day/household	0.20	0.20	0.02	0.02	0.02	0.02	0.20	0.20	0.20	0.75	0.75	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Person/day/household	0.14	0.08	0.06	0.06	0.02	0.04	0.09	0.22	0.29	0.62	0.99	1.33	1.19	1.14	1.25	2.26	2.30	2.05	2.22	1.72	2.55	1.76	1.27	1.02	2.13	1.32	1.18	1.17	1.28	1.35	0.26	0.22	0.19	0.23	0.17	0.17			

Note : Average holding size of farm land in Masangdaza project area is wet land of 0.87 ha and dry land 0.46 ha.

Table IV.3.2. FUTURE LABOUR REQUIREMENTS IN THE MODEL PROJECT AREA (2/2)
(MASANGDAZA MODEL PROJECT AREA)

Labour Requirement	January			February			March			April			May			June			July			August			September			October			November			December			
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	
Paddy (wet land)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Man-day/ha	169																																				
Area	0.79	ha																																			
Person/day/household	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Wheat (wet land)	0.39	0.39	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
Man-day/ha	65																																				
Area	0.20	ha																																			
Person/day/household	0.08	0.08	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Mustard (wet land)	0.41	0.41	0.28	0.28	0.03	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	
Man-day/ha	69																																				
Area	0.20	ha																																			
Person/day/household	0.08	0.08	0.06	0.06	0.01	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	
Maize/soyabean (dry land)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Man-day/ha	83																																				
Area	0.38	ha																																			
Person/day/household	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Wheat (dry land)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Man-day/ha	59																																				
Area	0.09	ha																																			
Person/day/household	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Mustard (dry land)	0.23	0.23	0.78	0.78	0.78	0.78	0.57	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	
Man-day/ha	59																																				
Area	0.09	ha																																			
Person/day/household	0.02	0.02	0.07	0.07	0.07	0.07	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
Total	0.18	0.18	0.14	0.14	0.14	0.13	0.18	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	
Person/day/household	1.69	1.69	1.49	1.49	1.49	1.49	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	

Note : Average holding size of farm land in Masangdaza project area is wet land of 0.79 ha and dry land 0.38 ha.

Table IV.3.3 FUTURE CROP PRODUCTION
IN THE MODEL PROJECT AREA

Area	Crop	Cropped Area (ha)	Unit yield (ton/ha)	Total production (ton)
I. Tangmachhu model project area				
Wet land	Paddy	220	5.0	1,100
	Wheat	55	1.8	99
	Mustard	55	0.9	50
Dry land	Maize	57	1.5	86
	Soyabean	57	0.5	29
	Chilli	57	2.0	114
	Wheat	29	1.2	35
	Mustard	29	0.6	17
Total	Paddy	220	-	1,100
	Maize	57	-	86
	Wheat	84	-	134
	Mustard	84	-	67
	Soyabean	57	-	29
	Chilli	57	-	114
II. Masangdaza model project area				
Wet land	Paddy	80	5.0	400
	Wheat	20	1.8	36
	Mustard	20	0.9	18
Dry land	Maize	31	1.5	47
	Soyabean	31	0.5	16
	Wheat	8	1.2	10
	Mustard	8	0.6	5
Total	Paddy	80	-	400
	Maize	31	-	47
	Wheat	28	-	46
	Mustard	28	-	23
	Soyabean	31	-	16

Table IV.3.4 ECONOMIC PRICES FOR AGRICULTURAL OUTPUTS AND INPUTS, 1995 (1/2)
(1988 CONSTANT PRICE)

I. Paddy

Item	Unit	Import Parity Price
1) Projected 1995 price /_1	US\$/ton	293
2) Ocean freight and insurance	US\$/ton	35
3) Grade differential /_2	US\$/ton	-44
4) CIF Calcutta price	US\$/ton	284
5) Converted to Ngultrum (Nu14.0/US\$)	Nu/ton	3,976
6) Port charges, handling and storage	Nu/ton	300
7) Transport cost (Calcutta-Project Area)	Nu/ton	500
8) Wholesale price in Project Area	Nu/ton	4,776
9) Milling cost	Nu/ton	-180
10) Ex-mill price of paddy /_3	Nu/ton	2,987
11) Transportation cost (farm-mill)	Nu/ton	-50
12) Farm gate price of paddy	Nu/ton	2,937
		: 2,900

/_1 World Bank price projection for 5% broken rice (FOB Bangkok)
/_2 Applied quality discount rate of 15% to 5% broken rice
of Thailand
/_3 Applied milling rate of 65%

III. Wheat

Item	Unit	Import Parity Price
1) Projected 1995 price /_1	US\$/ton	187
2) Ocean freight and insurance	US\$/ton	40
4) CIF Calcutta price	US\$/ton	227
5) Converted to Ngultrum (Nu14.0/US\$)	Nu/ton	3,178
6) Port charges, handling and storage	Nu/ton	300
7) Transport cost (Calcutta-Project Area)	Nu/ton	500
8) Wholesale price in Project Area	Nu/ton	3,978
9) Transportation cost (farm-market)	Nu/ton	-50
10) Farm gate price of wheat	Nu/ton	3,928
		: 3,900

/_1 World Bank price projection for Canadian No. 1 Western
Red Spring, Thunder Bay

V. Mustard

Item	Unit	Import Parity Price
1) Projected 1995 price /_1	US\$/ton	603
2) Ocean freight and insurance	US\$/ton	40
3) CIF Calcutta price	US\$/ton	643
4) Converted to Ngultrum (Nu14.0/US\$)	Nu/ton	9,002
5) Port charges, handling and storage	Nu/ton	300
6) Repackaging	Nu/ton	700
7) Transport cost (Calcutta-Project Area)	Nu/ton	500
8) Wholesale price in Project Area	Nu/ton	10,502
9) Extraction cost	Nu/ton	-500
10) Value of extracting by-product	Nu/ton	400
11) Ex-mill price of seed /_2	Nu/ton	3,640
12) Transportation cost (farm-mill)	Nu/ton	-50
13) Farm gate price of seed	Nu/ton	3,590
		: 3,600

/_1 World Bank price projection for Malaysian palm oil
(CIF European ports)
/_2 Applied extraction rate of 35%

II. Maize

Item	Unit	Import Parity Price
1) Projected 1995 price /_1	US\$/ton	130
2) Ocean freight and insurance	US\$/ton	40
4) CIF Calcutta price	US\$/ton	170
5) Converted to Ngultrum (Nu14.0/US\$)	US\$/ton	2,380
6) Port charges, handling and storage	Nu/ton	300
7) Transport cost (Calcutta-Project Area)	Nu/ton	500
8) Wholesale price in Project Area	Nu/ton	3,180
9) Transportation cost (farm-market)	Nu/ton	-50
10) Farm gate price of maize	Nu/ton	3,130
		: 3,100

/_1 World Bank price projection for US No. 2 yellow
(FOB US Gulf port)

IV. Soyabean

Item	Unit	Import Parity Price
1) Projected 1995 price /_1	US\$/ton	288
2) Ocean freight and insurance	US\$/ton	40
4) CIF Calcutta price	US\$/ton	328
5) Converted to Ngultrum (Nu14.0/US\$)	US\$/ton	4,592
6) Port charges, handling and storage	Nu/ton	300
7) Transport cost (Calcutta-Project Area)	Nu/ton	500
8) Wholesale price in Project Area	Nu/ton	5,392
9) Transportation cost (farm-mill)	Nu/ton	-50
10) Farm gate price of soyabean	Nu/ton	5,342
		: 5,300

/_1 World Bank price projection for US soyabean
(CIF Rotterdam)

Table IV.3.4

ECONOMIC PRICES FOR AGRICULTURAL
 OUTPUTS AND INPUTS, 1995 (2/2)
 (1988 CONSTANT PRICE)

Item	Unit	Import Parity Price		
		Urea	T.S.P	KCl
1) Projected 1995 world market price /_1	US\$/ton	229	199	114
2) Ocean freight and insurance	US\$/ton	35	45	35
3) CIF Calcutta price	US\$/ton	264	244	149
4) Converted to Ngultrum (Nu14.0/US\$)	Nu/ton	3,696	3,416	2,086
5) Port charges, handling and storage	Nu/ton	260	260	260
6) Transportation cost (Calcutta-Project Area)	Nu/ton	500	500	500
7) Wholesale price in Project Area	Nu/ton	4,456	4,176	2,846
8) Transportation cost (store-farm)	Nu/ton	50	50	50
9) Farm gate price	Nu/ton	4,506	4,226	2,896
		(N:42%)	(P2O5:46%)	(K2O:60%)
Price per nutrient	Nu/Kg	10.7	9.2	4.8

/_1 World Bank price projection

Urea : FOB Europe
 T.S.P : FOB US Gulf
 KCl : FOB Vancouver

Table IV.3.6 DEMAND AND SUPPLY OF AGRICULTURAL PRODUCTS IN THE MODEL PROJECT AREA, 1995

Area/ Crops	Future Production (t)	Food		Local Consumption			Others		Marketable		
		Per Capita (kg)	Total (t)	Planted Area (ha)	Seed Rate (kg/ha)	Total Consumption (t)	Percent to Production (%)	Total Consumption (t)	Quantity (t)	Quantity Percent to Production (%)	
I. Tangmachhu											
1) Paddy	1,100	250	697	220	60	13	5	55	765	335	30
2) Maize	86	27	75	57	30	2	10	9	86	0	0
3) Wheat	134	23	64	84	125	11	10	13	88	46	34
4) Soyabean	29	0	0	57	30	2	10	3	5	24	83
5) Mustard	67	0	0	84	13	1	10	7	8	59	88
6) Chilli	114	2	5	57	1.5	1	0	0	6	108	95
I. Masangdaza											
1) Paddy	400	250	148	80	60	5	5	20	173	227	57
2) Maize	47	50	29	31	30	1	10	5	35	12	26
3) Wheat	46	0	0	28	125	4	10	5	9	37	80
4) Soyabean	16	0	0	31	30	1	10	2	3	13	81
5) Mustard	23	0	0	28	13	1	10	2	3	20	87

Note : Food demand is estimated on the basis of the future population in 1995 ;
Tangmachhu of 2,788 and Masangdaza of 572 applying population growth rate of 2 % p.a.

Table IV.3.7 DISTRIBUTION OF MARKETABLE AGRICULTURAL PRODUCTS FROM THE MODEL PROJECT AREA

Item	Unit	Tangmachhu	Masangdaza	Total
I. Rice (paddy)				
1. Marketable Quantity	t	335	227	562
- Paddy	t	217	147	364
- Rice (Milling rate of 65%)	t	120	270	390
2. Deficit of Rice (1988)	%	181	54	93
3. Percentage of (1) to (2)				
II. Maize				
1. Marketable Quantity/District Consumption	t	0	12	12
III. Wheat				
1. Marketable Quantity	t	46	37	83
2. Deficit (1988)	t	10	30	40
3. Transport Q'ty to Other Region	t	36	7	43
IV. Soyabean				
1. Marketable Quantity/Exportation	t	24	13	37
V. Mustard				
1. Marketable Quantity	t	59	20	79
- Seed	t	20	7	27
- Oil (Extraction rate of 35%)		10	13	23
2. Deficit of Oil (1988)		10	-6	4
3. Transport Q'ty to Other Region				
VI. Chilli				
1. Marketable Quantity/Exportation	t	108	-	108

Table IV.3.8 ECONOMIC PRODUCTION COST
UNDER WITHOUT PROJECT CONDITION (1/4)

Description	Unit	Price (Nu/unit)	Quantity (unit/ha)	Amount (NU/ha)
PADDY				
I Labour Cost				
(1) Nursery	man-day	13.5	16	216
(2) Manuring	man-day	13.5	4	54
(3) Land preparation	man-day	13.5	58	783
(4) Transplanting	man-day	13.5	45	608
(5) 1st Weeding	man-day	13.5	17	230
(6) 2nd Weeding	man-day	13.5	17	230
(7) Harvesting	man-day	13.5	26	351
(8) Drying	man-day	13.5	1	14
(9) Threshing	man-day	13.5	34	459
(10) Transportation	man-day	13.5	8	108
(11) Water management	man-day	13.5	6	81
Sub-total			232	3,132
II Bullock	pair-day	54.0	13	702
III Farm Input				
(1) Seed	kg	0.0	50	0
(2) Farm yard manure	kg	0.0	3,000	0
Sub-total				0
IV Miscellaneous	5% of (I+II+III)	5%	3,834	192
V Grand Total (I+II+III+IV)				4,026 (4,030)
MAIZE/SOYABEAN				
I Labour Cost				
(1) Land preparation	man-day	13.5	23	311
(2) Manuring	man-day	13.5	4	54
(3) Sowing	man-day	13.5	10	135
(4) 1st Weeding	man-day	13.5	11	149
(5) 2nd Weeding	man-day	13.5	11	149
(6) Harvesting	man-day	13.5	15	203
(7) Threshing	man-day	13.5	10	135
(8) Transportation	man-day	13.5	0	0
Sub-total			84	1,137
II Bullock	pair-day	54.0	12	648
III Farm Input				
(8) Seed (maize)	kg	0.0	25	0
(soyabean)	kg	0.0	30	0
Farm yard manure	kg	0.0	3,000	0
Sub-total				0
IV Miscellaneous	5% of (I+II+III)	5%	1,785	89
V Grand Total (I+II+III+IV)				1,875 (1,870)

Table IV.3.8 ECONOMIC PRODUCTION COST
UNDER WITHOUT PROJECT CONDITION (2/4)

Description	Unit	Price (Nu/unit)	Quantity (unit/ha)	Amount (Nu/ha)
MAIZE				
I Labour Cost				
(1) Land preparation	man-day	13.5	23	311
(2) Manuring	man-day	13.5	4	54
(3) Sowing	man-day	13.5	10	135
(4) 1st Weeding	man-day	13.5	11	149
(5) 2nd Weeding	man-day	13.5	11	149
(6) Harvesting	man-day	13.5	15	203
(7) Threshing	man-day	13.5	10	135
Sub-total			84	1,137
II Bullock	pair-day	54.0	6	324
III Farm Input				
(1) Seed	kg	0.0	30	0
(2) Farm yard manure	kg	0.0	3,000	0
Sub-total				0
IV Miscellaneous	5% of (I+II+III)	5%	1,461	73
V Grand Total (I+II+III+IV)				1,534 (1,530)
WHEAT				
I Labour Cost				
(1) Land preparation	man-day	13.5	23	311
(2) Manuring	man-day	13.5	4	54
(3) Sowing	man-day	13.5	4	54
(4) 1st Weeding	man-day	13.5	5	68
(5) 2nd Weeding	man-day	13.5	5	68
(6) Harvesting	man-day	13.5	15	203
(7) Drying	man-day	13.5	1	14
(8) Threshing	man-day	13.5	20	270
(9) Transportation	man-day	13.5	2	27
Sub-total			79	1,067
II Bullock	pair-day	54.0	4	216
III Farm Input				
(1) Seed	kg	0.0	100	0
(2) Farm yard manure	kg	0.0	3,000	0
Sub-total				0
IV Miscellaneous	5% of (I+II+III)	5%	1,283	64
V Grand Total (I+II+III+IV)				1,347 (1,350)

Table IV.3.8 ECONOMIC PRODUCTION COST
UNDER WITHOUT PROJECT CONDITION (3/4)

Description	Unit	Price (Nu/unit)	Quantity (unit/ha)	Amount (Nu/ha)
MUSTARD				
I Labour Cost				
(1) Land preparation	man-day	13.5	10	135
(2) Sowing	man-day	13.5	5	68
(3) Harvesting	man-day	13.5	5	68
(4) Drying	man-day	13.5	3	41
(5) Threshing	man-day	13.5	7	95
(6) Transportation	man-day	13.5	1	14
Sub-total			31	419
II Bullock	pair-day	54.0	3	162
III Farm Input				
(1) Seed	kg	0.0	10	0
(2) Farm yard manure	kg	0.0	3,000	0
Sub-total				0
IV Miscellaneous	5% of (I+II+III)	5%	581	29
V Grand Total (I+II+III+IV)				610 (610)
CHILLI				
I Labour Cost				
(1) Nursery	man-day	13.5	10	135
(2) Land preparation	man-day	13.5	30	405
(3) Manuring	man-day	13.5	6	81
(4) Transplantig	man-day	13.5	40	540
(5) 1st Weeding	man-day	13.5	20	270
(6) 2nd Weeding	man-day	13.5	20	270
(7) Harvesting	man-day	13.5	80	1,080
(8) Drying	man-day	13.5	50	675
(9) Transportation	man-day	13.5	10	135
Sub-total			266	3,591
II Bullock	pair-day	54.0	10	540
III Farm Input				
(1) Seed	kg	180.0	0	0
(2) Farm yard manure	kg	0.0	0	0
Sub-total				0
IV Miscellaneous	5% of (I+II+III)	5%	4,131	207
V Grand Total (I+II+III+IV)				4,338 (4,340)

Table IV.3.8 ECONOMIC PRODUCTION COST
UNDER WITHOUT PROJECT CONDITION (4/4)

Description	Unit	Price (Nu/unit)	Quantity (unit/ha)	Amount (Nu/ha)
BUCKWHEAT				
I Labour Cost				
(1) Land preparation	man-day	13.5	10	135
(2) Sowing	man-day	13.5	2	27
(3) Harvesting	man-day	13.5	5	68
(4) Drying	man-day	13.5	2	27
(5) Threshing	man-day	13.5	6	81
(6) Transportation	man-day	13.5	3	41
Sub-total			28	378
II Bullock	pair-day	54.0	2	108
III Farm Input				
(1) Seed	kg		50	0
(2) Farm yard manure	kg	0.0	0	0
Sub-total				0
IV Miscellaneous	5% of (I+II+III)	5%	486	24
V Grand Total (I+II+III+IV)				510 (510)
POTATO				
I Labour Cost				
(1) Land preparation	man-day	13.5	15	203
(2) Manuring	man-day	13.5	4	54
(3) Sowing	man-day	13.5	5	68
(4) Harvesting	man-day	13.5	16	216
(5) Transportation	man-day	13.5	5	68
Sub-total			45	608
II Bullock	pair-day	54.0	4	216
III Farm Input				
(1) Seed	kg	2.4	900	2,160
(2) Farm yard manure	kg	0.0	0	0
Sub-total				2,160
IV Miscellaneous	5% of (I+II+III)	5%	2,984	149
V Grand Total (I+II+III+IV)				3,133 (3,130)

Table IV.3.9 ECONOMIC PRODUCTION COST UNDER
WITH PROJECT CONDITION (1/4)

Description	Unit	Price (Nu/unit)	Quantity (unit/ha)	Amount (NU/ha)
PADDY				
I Labour Cost				
(1) Nursery	man-day	13.5	10	135
(2) Manuring	man-day	13.5	4	54
(3) Land preparation	man-day	13.5	20	270
(4) Transplanting	man-day	13.5	45	608
(5) 1st Weeding	man-day	13.5	10	135
(6) 1st Fertilizer	man-day	13.5	11	149
(7) 2nd Weeding	man-day	13.5	10	135
(8) Pest Control	man-day	13.5	3	41
(9) Harvesting	man-day	13.5	35	473
(10) Drying	man-day	13.5	1	14
(11) Threshing	man-day	13.5	10	135
(12) Transportation	man-day	13.5	10	135
(13) Water management	man-day	13.5	10	135
Sub-total			179	2,417
II Bullock	pair-day	54.0	8	432
III Farm Input				
(1) Seed (25% every year)	kg	5.4	12.5	68
(2) Urea	N/kg	10.7	71.1	761
(3) TSP	P205/kg	9.2	29.4	270
(4) Farm yard manure	kg	0.0	4,000	0
(5) Hinosan	lit.	100.1	0.1	10
(6) Thimet 10 granule	kg	16.4	25	410
(7) Nuvacron	lit.	100.1	0.1	10
Sub-total				1,529
IV Miscellaneous	5% of I+II+III	5%	4,377	219
V Grand Total (I+II+III+IV)				4,596 (4,600)
MAIZE/SOYABEAN				
I Labour Cost				
(1) Land preparation	man-day	13.5	15	203
(2) Manuring	man-day	13.5	5	68
(3) Sowing	man-day	13.5	10	135
(4) 1st Weeding	man-day	13.5	10	135
(5) 2nd Weeding	man-day	13.5	10	135
(6) Pest Control	man-day	13.5	5	68
(7) Harvesting	man-day	13.5	10	135
(8) Drying	man-day	13.5	3	41
(9) Threshing	man-day	13.5	10	135
(10) Transportation	man-day	13.5	5	68
Sub-total			83	1,124
II Bullock	pair-day	54.0	8	432
III Farm Input				
(1) Seed (25% every year)				
(maize)	kg	10.4	6.3	65
(soyabean)	kg	9.6	7.5	72
(2) Urea	N/kg	10.7	0.0	0
(3) TSP	P205/kg	9.2	0.0	0
(4) Farm yard manure	kg	0.0	4,000	0
(5) Nuvacron	lit.	100.1	0.1	10
(6) Thimet 10 granule	kg	16.4	25	410
Sub-total				557
IV Miscellaneous	5% of I+II+III	5%	2,113	106
V Grand Total (I+II+III+IV)				2,218 (2,220)

Table IV.3.9 ECONOMIC PRODUCTION COST UNDER
WITH PROJECT CONDITION (2/4)

Description	Unit	price (Nu/unit)	Quantity (unit/ha)	Amount (Nu/ha)
RAINFED WHEAT				
I Labour Cost				
(1) Land preparation	man-day	13.5	10	135
(2) Manuring	man-day	13.5	4	54
(3) Sowing	man-day	13.5	5	68
(4) 1st Weeding	man-day	13.5	5	68
(5) Pest Control	man-day	13.5	1	14
(6) Harvesting	man-day	13.5	15	203
(7) Drying	man-day	13.5	3	41
(8) Threshing	man-day	13.5	7	95
(9) Transportation	man-day	13.5	3	41
Sub-total			53	716
II Bullock	pair-day	54.0	3	162
III Farm Input				
(1) Seed (25% every year)	kg	6.3	25	158
(2) Farm yard manure	kg	0.0	4,000	0
(3) Vitavax	kg	16.4	0.1	1
Sub-total				158
IV Miscellaneous	5% of (I+II+III)	5%	1,036	52
V Grand Total (I+II+III+IV)				1,088 (1,090)
IRRIGATED WHEAT				
I Labour Cost				
(1) Land preparation	man-day	13.5	10	135
(2) Manuring	man-day	13.5	4	54
(3) Sowing	man-day	13.5	5	68
(4) 1st Weeding	man-day	13.5	5	68
(5) 1st Fertilizer	man-day	13.5	2	27
(6) Pest Control	man-day	13.5	1	14
(7) Harvesting	man-day	13.5	15	203
(8) Drying	man-day	13.5	1	14
(9) Threshing	man-day	13.5	7	95
(10) Transportation	man-day	13.5	3	41
(11) Water management	man-day	13.5	5	68
Sub-total			58	783
II Bullock	pair-day	54.0	2	108
III Farm Input				
(1) Seed (25% every year)	kg	6.3	25	158
(2) Urea	N/kg	10.7	27.6	295
(3) Farm yard manure	kg	0.0	4,000	0
(4) Vitavax	kg	16.4	0.1	1
Sub-total				454
IV Miscellaneous	5% of (I+II+III)	5%	1,345	67
V Grand Total (I+II+III+IV)				1,412 (1,410)

Table IV.3.9 ECONOMIC PRODUCTION COST UNDER
WITH PROJECT CONDITION (3/4)

Description	Unit	price (Nu/unit)	Quantity (unit/ha)	Amount (Nu/ha)
RAINFED MUSTARD				
I Labour Cost				
(1) Land preparation	man-day	13.5	7	95
(2) Sowing	man-day	13.5	3	41
(3) 1st Weeding	man-day	13.5	4	54
(4) 2nd Weeding	man-day	13.5	4	54
(5) Pest Control	man-day	13.5	2	27
(6) Harvesting	man-day	13.5	7	95
(7) Drying	man-day	13.5	1	14
(8) Threshing	man-day	13.5	7	95
(9) Transportation	man-day	13.5	2	27
Sub-total			37	500
II Bullock	pair-day	54.0	3	162
III Farm Input				
(1) Seed (25% every year)	kg	9.2	2.5	23
(2) Aphid	lit.	100.1	0.1	10
Sub-total				33
IV Miscellaneous	5% of (I+II+III)	5%	695	35
V Grand Total (I+II+III+IV)				729
				(730)
IRRIGATED MUSTARD				
I Labour Cost				
(1) Land preparation	man-day	13.5	7	95
(2) Sowing	man-day	13.5	3	41
(3) 1st Weeding	man-day	13.5	4	54
(4) 2nd Weeding	man-day	13.5	4	54
(5) Pest Control	man-day	13.5	2	27
(6) Harvesting	man-day	13.5	7	95
(7) Drying	man-day	13.5	1	14
(8) Threshing	man-day	13.5	7	95
(9) Transportation	man-day	13.5	2	27
(10) Water management	man-day	13.5	2	27
Sub-total			39	527
II Bullock	pair-day	54.0	2	108
III Farm Input				
(1) Seed (25% every year)	kg	9.2	2.5	23
(2) Urea	N/kg	10.7	32.2	345
(3) TSP	P205/kg	9.2	25.5	235
Aphid	lit.	100.1	0.1	10
Sub-total				612
IV Miscellaneous	5% of (I+II+III)	5%	1,247	62
V Grand Total (I+II+III+IV)				1,309
				(1,310)

Table IV.3.9 ECONOMIC PRODUCTION COST UNDER
WITH PROJECT CONDITION (4/4)

Description	Unit	price (Nu/unit)	Quantity (unit/ha)	Amount (Nu)
CHILLI				
I Labour Cost				
(1) Nursery	man-day	13.5	10	135
(2) Land preparation	man-day	13.5	25	338
(3) Manuring	man-day	13.5	4	54
(4) Transplanting	man-day	13.5	45	608
(5) 1st Weeding	man-day	13.5	30	405
(6) 1st Fertilizer	man-day	13.5	3	41
(7) 2nd Weeding	man-day	13.5	25	338
(8) 3rd Weeding	man-day	13.5	20	270
(9) Pest Control	man-day	13.5	4	54
(10) Harvesting	man-day	13.5	70	945
(11) Drying	man-day	13.5	40	540
(12) Transportation	man-day	13.5	15	203
Sub-total			291	3,929
II Bullock	pair-day	54.0	9	486
III Farm Input				
(1) Seed (25% every year)	kg	180.0	1.0	180
(2) Urea	N/kg	10.7	92.4	989
(3) TSP	P205/kg	9.2	46.2	425
(4) Farm yard manure	kg	0.0	4,000	0
(5) Thimet 10 granule	kg	16.4	25	410
(6) Copper fungicide	lit.	100.1	0.1	10
Sub-total				2,014
IV Miscellaneous	5% of (I+II+III)	5%	6,428	321
V Grand Total (I+II+III+IV)				6,750 (6,750)

Table IV.3.10 IRRIGATION DEVELOPMENT BENEFIT IN THE MODEL PROJECT AREA

Crop	A		B	C=AxB	D	E=Dx1000xE	F	G=AxF	H=E-G
	Area (ha)	Unit yield (ton/ha)							
Tangmachhu									
Without project									
Paddey	170	2.2	374	2.9	1,084,600	4,030	685,100	399,500	
Wheat	2	1.0	2	3.9	7,800	1,350	2,700	5,100	
Potato	2	2.1	4	1.6	6,700	3,130	6,300	400	
Total	-	-	-	-	1,099,100	-	694,100	405,000	
With project									
Paddy	220	5.0	1,100	2.9	3,190,000	4,600	1,012,000	2,178,000	
Wheat	55	1.8	99	3.9	386,100	1,410	77,600	308,500	
Mustard	55	0.9	50	3.6	178,200	1,310	72,100	106,100	
Total	-	-	-	-	3,754,300	-	1,161,700	2,592,600	
Net Incremental {(With project)-(Without project)}									
Masangdaza									
Without project									
Paddey	30	1.5	45	2.9	130,500	4,030	120,900	9,600	
Maize (1st)	20	1.1	22	3.1	68,200	1,870	37,400	30,800	
Maize (2nd)	5	1.1	6	3.1	17,100	1,530	7,700	9,400	
Buckwheat	5	0.4	2	1.4	2,800	510	2,600	200	
Mustard	1	0.3	0	3.6	1,100	610	600	500	
Total	-	-	-	-	219,700	-	169,200	50,500	
With project									
Paddy	80	5.0	400	2.9	1,160,000	4,600	368,000	792,000	
Wheat	20	1.8	36	3.9	140,400	1,410	28,200	112,200	
Mustard	20	0.9	18	3.6	64,800	1,310	26,200	38,600	
Total	-	-	-	-	1,365,200	-	422,400	942,800	
Net Incremental {(With project)-(Without project)}									

Table IV.3.11 FARM BUDGET ANALYSIS IN THE MODEL PROJECT AREA (1/8)

TANGMACHHU (Farm Size : Below 0.59 ha)		Without Project Condition	
		With Project Condition	Without Project Condition
1. Farm Size (ha)			
Wet Land	0.25	0.25	0.25
Dry Land	0.16	0.16	0.19
Total	0.41	0.41	0.83
2. Family Size			
	6.4	6.4	7.3
3. Crop Production (t)			
Paddy	0.25	5.0	3.5
Maize	0.08	1.5	1.4
(Soyabean)	0.08	0.5	0.3
Wheat/Buckwheat	0.10	1.8/1.2	0.16
Chilli	0.08	2.0	0.2
Mustard	0.10	0.9/0.6	0.08
4. Disposal of Product (t)			
Paddy	1,133	50	7
Maize	115	0	5
(Soyabean)	35	0	5
Wheat/Buckwheat	147	0	13
Chilli	12	147	1
Mustard	0	71	9
5. Farm Income (Nu)			
Paddy	50	3.0	150
Maize	0	2.6	0
(Soyabean)	0	2.7	0
Wheat/Buckwheat	0	2.4	0
Chilli	147	10.0	1,470
Mustard	71	4.0	284
Others			160
Total			2,064
6. Non-Farm Income (Nu)			
			1,590
7. Total Income (Nu)			
			3,654
8. Production Cost (Nu)			
Paddy	288		72
Maize	98		8
(Soyabean)			
Wheat	172/105		15
Chilli	491		39
Mustard	137/28		9
Total			143
9. Living Expenses (Nu)			
			2,944
10. Net Reserve (Nu)			
			567

Table IV.3.11 FARM BUDGET ANALYSIS IN THE MODEL PROJECT AREA (2/8)

TANGMACHHU (Farm Size : 0.59 - 1.08 ha)		Without Project Condition	
		With Project Condition	Without Project Condition
1. Farm Size (ha)			
Wet Land	0.64	0.64	0.64
Dry Land	0.19	0.19	0.19
Total	0.83	0.83	0.83
2. Family Size			
	7.3	7.3	7.3
3. Crop Production (t)			
Paddy	0.64	5.0	3.20
Maize	0.10	1.5	0.15
(Soyabean)	0.10	0.5	0.05
Wheat/Buckwheat	0.21	1.8/1.2	0.35
Chilli	0.10	2.0	0.20
Mustard	0.21	0.9/0.6	0.17
4. Disposal of Product (t)			
Paddy	1,825	1177	198
Maize	132	0	18
(Soyabean)	0	42	8
Wheat/Buckwheat	233	56	61
Chilli	14	185	1
Mustard	0	151	19
5. Farm Income (Nu)			
Paddy	1,177	3.0	3,531
Maize	0	2.6	0
(Soyabean)	42	2.7	113
Wheat/Buckwheat	56	2.4	134
Chilli	185	10.0	1,850
Mustard	151	4.0	604
Others			160
Total			6,392
6. Non-Farm Income (Nu)			
			2,020
7. Total Income (Nu)			
			8,412
8. Production Cost (Nu)			
Paddy	303		194
Maize	453		45
(Soyabean)			
Wheat	172/105		33
Chilli	491		49
Mustard	137/28		22
Total			343
9. Living Expenses (Nu)			
			3,358
10. Net Reserve (Nu)			
			4,711

Table IV.3.11 FARM BUDGET ANALYSIS IN THE MODEL PROJECT AREA (3/8)

TANGMACHHU (Farm size : 1.08 - 1.74 ha)		Without Project Condition	
1. Farm Size (ha)	1.07	1.07	1.07
Wet Land	0.29	0.29	0.29
Dry Land	1.36	1.36	1.36
Total	1.65	1.65	1.65
2. Family Size	9.2	9.2	9.2
3. Crop Production (t)			
Paddy	1.07	2.7	2.84
Maize	0.14	1.4	0.41
(Soyabean)	0.14	0.3	0.07
Wheat/Buckwheat	0.34	1.0	0.01
Chilli	0.14	0.2	0.01
Mustard	0.34	0.2	0.01
4. Disposal of Product (t)			
Paddy	1.893	91	866
Maize	185	371	39
(Soyabean)	0	34	7
Wheat/Buckwheat	275	196	10
Chilli	18	9	1
Mustard	0	9	1
5. Farm Income (Nu)			
Paddy	2,719	3.0	8,157
Maize	0	2.6	0
(Soyabean)	59	2.7	159
Wheat/Buckwheat	196	2.4	470
Chilli	261	10.0	2,610
Mustard	248	4.0	992
Others	160		3,115
Total	12,548		3,470
6. Non-Farm Income (Nu)			
	2,195		2,195
7. Total Income (Nu)			
	14,743		5,665
8. Production Cost (Nu)			
Paddy	303		324
Maize	453		63
(Soyabean)			
Wheat	172/105		54
Chilli	491		69
Mustard	137/28		37
Total	547		547
9. Living Expenses (Nu)			
	4,910		4,910
10. Net Reserve (Nu)			
	9,285		755

Table IV.3.11 FARM BUDGET ANALYSIS IN THE MODEL PROJECT AREA (4/8)

TANGMACHHU (Farm size : Over 1.74 ha)		With Project Condition		Without Project Condition	
1. Farm Size (ha)	2.20	2.20	2.20	2.20	2.20
Wet Land	0.60	0.60	0.60	0.60	0.60
Dry Land	2.80	2.80	2.80	2.80	2.80
Total	3.40	3.40	3.40	3.40	3.40
2. Family Size	12.3	12.3	12.3	12.3	12.3
3. Crop Production (t)					
Paddy	2.20	5.0	11.00	2.2	1.6
Maize	0.30	1.5	0.45	0.60	0.8
(Soyabean)	0.30	0.5	0.15	0.47	0.3
Wheat/Buckwheat	0.70	1.8/1.2	1.17	0.02	1.0
Chilli	0.30	2.0	0.6	0.01	0.2
Mustard	0.70	0.9/0.6	0.59	0.04	0.2
4. Disposal of Product (t)					
Paddy	3.075	7,243	882	2,646	636
Maize	396	0	54	439	0
(Soyabean)	0	126	24	73	52
Wheat/Buckwheat	219	747	204	0	10
Chilli	24	575	1	9	0
Mustard	0	522	68	9	0
5. Farm Income (Nu)					
Paddy	7,243	3.0	21,729	636	3.0
Maize	0	2.6	0	0	2.6
(Soyabean)	126	2.7	340	52	2.7
Wheat/Buckwheat	747	2.4	1,792	0	2.4
Chilli	575	10.0	5,750	0	10.0
Mustard	522	4.0	2,088	0	4.0
Others	160		160	0	0
Total	31,659		31,659	1,807	3,860
6. Non-Farm Income (Nu)					
	980		980		980
7. Total Income (Nu)					
	32,639		32,639		4,840
8. Production Cost (Nu)					
Paddy	303		667		667
Maize	453		136		136
(Soyabean)					
Wheat	172/105		110		110
Chilli	491		147		147
Mustard	137/28		76		76
Total	1,336		1,336		1,336
9. Living Expenses (Nu)					
	5,658		5,658		3,590
10. Net Reserve (Nu)					
	26,045		26,045		1,250

Table IV.3.11 FARM BUDGET ANALYSIS IN THE MODEL PROJECT AREA (5/8)

MANGODARA (Farm size : Below 0.80 ha)		Without Project Condition	
1. Farm Size (ha)			
Wet Land	0.40	0.14	
Dry Land	0.16	0.42	
Total	0.56	0.56	
2. Family Size	4.1	4.1	
3. Crop Production (t)	Area (ha)	Yield (t/ha)	Production (t)
Paddy	0.40	5.0	2.00
Maize	0.16	1.5	0.24
(Soyabean)	0.16	0.5	0.08
Buckwheat/Wheat	0.14	1.8/1.2	0.23
Mustard	0.14	0.9/0.6	0.11
4. Disposal of Product (t)	Food (kg)	Sold (kg)	Others (kg)
Paddy	1,025	851	124
Maize	210	0	30
(Soyabean)	0	68	12
Wheat	0	190	40
Mustard	0	98	12
5. Farm Income (Nu)	Sold (kg)	Price (Nu/kg)	Amount (Nu)
Paddy	851	3.0	2,553
Maize	0	2.6	0
(Soyabean)	68	2.7	183
Wheat	190	2.4	456
Mustard	98	4.0	392
Others			160
Total			3,744
6. Non-Farm Income (Nu)			395
7. Total Income (Nu)			4,139
8. Production Cost (Nu)	Per ha (Nu/ha)	Total (Nu)	
Paddy	303	121	
Maize	453	72	
(Soyabean)			
Wheat	172/105	21	
Mustard	137/28	15	
Total		229	
			- Included in living expenses-
9. Living Expenses (Nu)			690
10. Net Reserve (Nu)			2,024

Table IV.3.11 FARM BUDGET ANALYSIS IN THE MODEL PROJECT AREA (6/8)

MANGODARA (Farm size : 0.80 - 1.20 ha)		With Project Condition		Without Project Condition	
1. Farm Size (ha)					
Wet Land	0.61	0.61	0.17		
Dry Land	0.24	0.24	0.68		
Total	0.85	0.85			
2. Family Size	5.4	5.4			
3. Crop Production (t)	Area (ha)	Yield (t/ha)	Production (t)	Area (ha)	Yield (t/ha)
Paddy	0.61	5.0	3.05	0.17	1.8
Maize	0.24	1.5	0.36	1.00	1.3
(Soyabean)	0.24	0.5	0.12	0	0
Buckwheat/Wheat	0.21	1.8/1.2	0.35	0.03	0.4
Mustard	0.21	0.9/0.6	0.17	0	0.3
4. Disposal of Product (t)	Food (kg)	Sold (kg)	Others (kg)	Food (kg)	Sold (kg)
Paddy	1,350	1,511	199	251	4
Maize	270	47	43	1,058	30
(Soyabean)	0	101	19	0	0
Wheat	0	289	61	5	0
Mustard	0	151	19	0	0
5. Farm Income (Nu)	Sold (kg)	Price (Nu/kg)	Amount (Nu)	Sold (kg)	Price (Nu/kg)
Paddy	1,511	3.0	4,533	4	3.0
Maize	47	2.6	122	30	2.6
(Soyabean)	101	2.7	272	0	2.7
Wheat	289	2.4	693	0	2.4
Mustard	151	4.0	604	0	4.0
Others			160		
Total			6,384		
6. Non-Farm Income (Nu)			670		
7. Total Income (Nu)			7,054		
8. Production Cost (Nu)	Per ha (Nu/ha)	Total (Nu)			
Paddy	303	185			
Maize	453	109			
(Soyabean)					
Wheat	172/105	33			
Mustard	137/28	23			
Total		350			
					- Included in living expenses-
9. Living Expenses (Nu)			2,484		
10. Net Reserve (Nu)			4,220		

Table IV.3.11 FARM BUDGET ANALYSIS IN THE MODEL PROJECT AREA (7/8)

MASANGDAJA (Farm Size : 1.20 ha)				Without Project Condition			
1. Farm Size (ha)		With Project Condition		Without Project Condition			
Wet Land	0.86		0.11				
Dry Land	0.34		1.09				
Total	1.20		1.20				
2. Family Size		5.7		5.7			
3. Crop Production (t)							
	Area (ha)	Yield (t/ha)	Production (t)	Area (ha)	Yield (t/ha)	Production (t)	
#REF! Paddy	0.86	5.0	4.30	0.11	1.8	0.20	
#REF! Maize	0.34	1.5	0.51	1.38	1.3	1.80	
#REF! (Soybean)	0.34	0.5	0.17	0	0	0	
#REF! Wheat/Buckwheat	0.30	1.8/1.2	0.49	0.25	0.4	0.10	
#REF! Mustard	0.30	0.9/0.6	0.24	0.03	0.3	0.01	
4. Disposal of Product (t)							
	Food (kg)	Sold (kg)	Others (kg)	Food (kg)	Sold (kg)	Others (kg)	
#REF! Paddy	1,425	2,609	266	180	0	20	
#REF! Maize	285	0	61	1,558	0	242	
#REF! (Soybean)	0	143	27	0	0	0	
#REF! Wheat/Buckwheat	0	404	86	55	0	45	
#REF! Mustard	0	213	27	0	0	0	
5. Farm Income (Nu)							
	Sold (kg)	Price (Nu/kg)	Amount (Nu)	Sold (kg)	Price (Nu/kg)	Amount (Nu)	
#REF! Paddy	2,609	3.0	7,827	0	3.0	0	
#REF! Maize	0	2.6	0	0	2.6	0	
#REF! (Soybean)	143	2.7	386	0	2.7	0	
#REF! Wheat/Buckwheat	404	2.4	969	0	2.4	0	
#REF! Mustard	213	4.0	852	0	4.0	0	
#REF! Others	150		150	260		260	
Total			10,194			280	
6. Non-Farm Income (Nu)							
			225			225	
7. Total Income (Nu)							
			10,419			505	
8. Production Cost (Nu)							
	Per ha (Nu/ha)		Total (Nu)			Total (Nu)	
#REF! Paddy	303		261			261	
#REF! Maize	453		154			154	
#REF! (Soybean)							
#REF! Wheat	172/105		46			46	
#REF! Mustard	137/28		32			32	
Total			493			493	
9. Living Expenses (Nu)							
			2,622			320	
10. Net Reserve (Nu)							
			7,304			185	

Table IV.3.11 FARM BUDGET ANALYSIS IN THE MODEL PROJECT AREA (8/8)

MASANGDAJA (Farm Size : Over 1.20 ha)				Without Project Condition			
1. Farm Size (ha)		With Project Condition		Without Project Condition			
Wet Land	1.26		0.38				
Dry Land	0.50		1.38				
Total	1.76		1.76				
2. Family Size		6.9		6.9			
3. Crop Production (t)							
	Area (ha)	Yield (t/ha)	Production (t)	Area (ha)	Yield (t/ha)	Production (t)	
#REF! Paddy	1.26	5.0	6.30	0.39	1.8	0.70	
#REF! Maize	0.50	1.5	0.75	2.23	1.3	2.90	
#REF! (Soybean)	0.50	0.5	0.25	0	0	0	
#REF! Wheat/Buckwheat	0.44	1.8/1.2	0.72	0.03	0.4	0.01	
#REF! Mustard	0.44	0.9/0.6	0.36	0	0	0	
4. Disposal of Product (t)							
	Food (kg)	Sold (kg)	Others (kg)	Food (kg)	Sold (kg)	Others (kg)	
#REF! Paddy	1,725	4,185	390	545	51	104	
#REF! Maize	345	0	89	1,968	319	593	
#REF! (Soybean)	0	211	39	0	0	0	
#REF! Wheat/Buckwheat	0	593	127	7	0	3	
#REF! Mustard	0	319	41	0	0	0	
5. Farm Income (Nu)							
	Sold (kg)	Price (Nu/kg)	Amount (Nu)	Sold (kg)	Price (Nu/kg)	Amount (Nu)	
#REF! Paddy	4,185	3.0	12,555	51	3.0	153	
#REF! Maize	0	2.6	0	319	2.6	830	
#REF! (Soybean)	211	2.7	569	0	2.7	0	
#REF! Wheat/Buckwheat	593	2.4	1,423	0	2.4	0	
#REF! Mustard	319	4.0	1,276	0	4.0	0	
#REF! Others	150		150	310		310	
Total			15,883			1,295	
6. Non-Farm Income (Nu)							
			375			375	
7. Total Income (Nu)							
			16,358			1,670	
8. Production Cost (Nu)							
	Per ha (Nu/ha)		Total (Nu)			Total (Nu)	
#REF! Paddy	303		382			382	
#REF! Maize	453		226			226	
#REF! (Soybean)							
#REF! Wheat	172/105		67			67	
#REF! Mustard	137/28		47			47	
Total			722			722	
9. Living Expenses (Nu)							
			3,174			1,100	
10. Net Reserve (Nu)							
			12,462			570	

Table IV.3.12 LAND AND LABOUR PRODUCTIVITY IN THE MODEL PROJECT AREA (1/2)
(WITHOUT PROJECT CONDITION)

Land / Crop	Yield (t/ha)	Financial Price (Nu/kg)	Production Value (Nu/ha)	Production Cost (Nu/ha)	Production Value per ha (Nu/ha)	Net Planted Area Ratio	Production Value per Area (Nu)	Labour Requirement per ha (Man-day/ha)	Labour Requirement of Area (Man-day)	Labour Productivity (Nu/man-day)
I. Irrigated Land										
(1) Tangmachhu										
Paddy	2.2	3.0	6,600	100	6,500	0.77	5,005	232	179	28
Wheat	1.0	2.4	2,400	60	2,340	0.01	23	79	1	23
Potato	1.4	1.8	2,520	122	2,398	0.01	24	45	0	0
Total							5,052	180	180	28
(2) Masangdaza										
Paddy	1.5	3.0	4,500	100	4,400	1.00	4,400	232	232	19
II. Rainfed Land										
(1) Tangmachhu										
Maize	1.4	2.6	3,640	50	3,590	1.00	4,214	84	84	50
(Soyabean)	0.3	(2.7)	(810)	(20)	(790)	(0.79)	/_1			
Mustard	0.2	4.0	800	50	750	0.06	45	31	2	23
Chilli	0.2	10.0	2,000	70	1,930	0.02	39	264	5	8
Total							4,298	91	91	47
(2) Masangdaza										
Maize	1.1	2.6	2,860	50	2,810	1.25	3,513	84	105	33
Buckwheat	0.4	1.5	600	40	560	0.25	140	53	13	11
Mustard	0.3	4.0	1,200	50	1,150	0.08	92	31	2	46
Total							3,745	120	120	31

/_1 : Including the net production value of soyabean.

Table IV.3.12 LAND AND LABOUR PRODUCTIVITY IN THE MODEL PROJECT AREA (2/2)
(WITH PROJECT CONDITION)

Land / Crop	Yield (t/ha)	Financial Price (Nu/kg)	Gross Production Value (Nu/ha)	Production Cost (Nu/ha)	Net Production Value per ha (Nu/ha)	Planted Area Ratio (Nu/ha)	Net Production Value per ha (Nu)	Labour Requirement per ha (Man-day/ha)	Labour Requirement of Area (Man-day)	Labour Productivity (Nu/man-day)
I. Irrigated Land										
Paddy	5.0	3.0	15,000	288	14,712	1.00	14,712	179	179	82
Wheat	1.8	2.4	4,320	172	4,148	0.25	1,037	58	15	69
Mustard	0.9	4.0	3,600	137	3,463	0.25	866	39	10	87
Total							16,615		204	81
II. Rainfed Land										
(1) Tangmachhu										
Maize	1.5	2.6	3,900	98	5,152	0.50	2,576	83	42	61
(Soyabean)	(0.5)	(2.7)	(1,350)							
Wheat	1.2	2.4	2,880	105	2,775	0.25	694	53	13	53
Mustard	0.6	4.0	2,400	28	2,372	0.25	593	37	9	66
Chilli	2.0	10.0	20,000	491	19,509	0.50	9,755	291	146	67
Total							13,618		210	65
(2) Masangdaza										
Maize	1.5	2.6	3,900	98	5,152	1.00	5,152	83	83	62
(Soyabean)	(0.5)	(2.7)	(1,350)							
Wheat	1.2	2.4	2,880	105	2,775	0.25	694	53	13	53
Mustard	0.6	4.0	2,400	28	2,372	0.25	593	37	9	66
Total							6,439		105	61

/_1 : Including the production cost of soyabean.

Table IV.3.13 AGRICULTURAL CREDIT PROGRAM IN BHUTAN

Activity	Loan Type	Loan Guidelines		Interest Rate	Loan Term	Security	Comments
		Minimum	Maximum				
Seed/Seedlings	Seasonal	Nu 200	Nu 5,000		1 Year or Less (1 season)	100-200 Nil 2001-5000 Surety	Disbursement as far as possible 'in kind' from DOA Godown Stores
Fertilizer							
Pesticides							
Tools/Implements							
Machinery					3 years	Machinery	DAO report on feasibility required; Justification for processing and cultivation machinery.
Livestock				10%			
Dairy Cows				(plus 5% penalty on		Livestock and Land (Surety if required)	Improved dairy breeds except with written approval of DOAH
Transport/Traction Animals							DAHO feasibility report read.
Pigs							
Poultry					2-5 years		
Fencing							
Land Development							
Irrigation							
Terracing/Bunding							
Orchard/Tree Crops							

Note: BDFC; Bhutan Development Finance Corporation, Ministry of Finance
 DOA; Department of Agriculture
 DOAH; Department of Animal Husbandry
 DAO; District Agriculture Officer

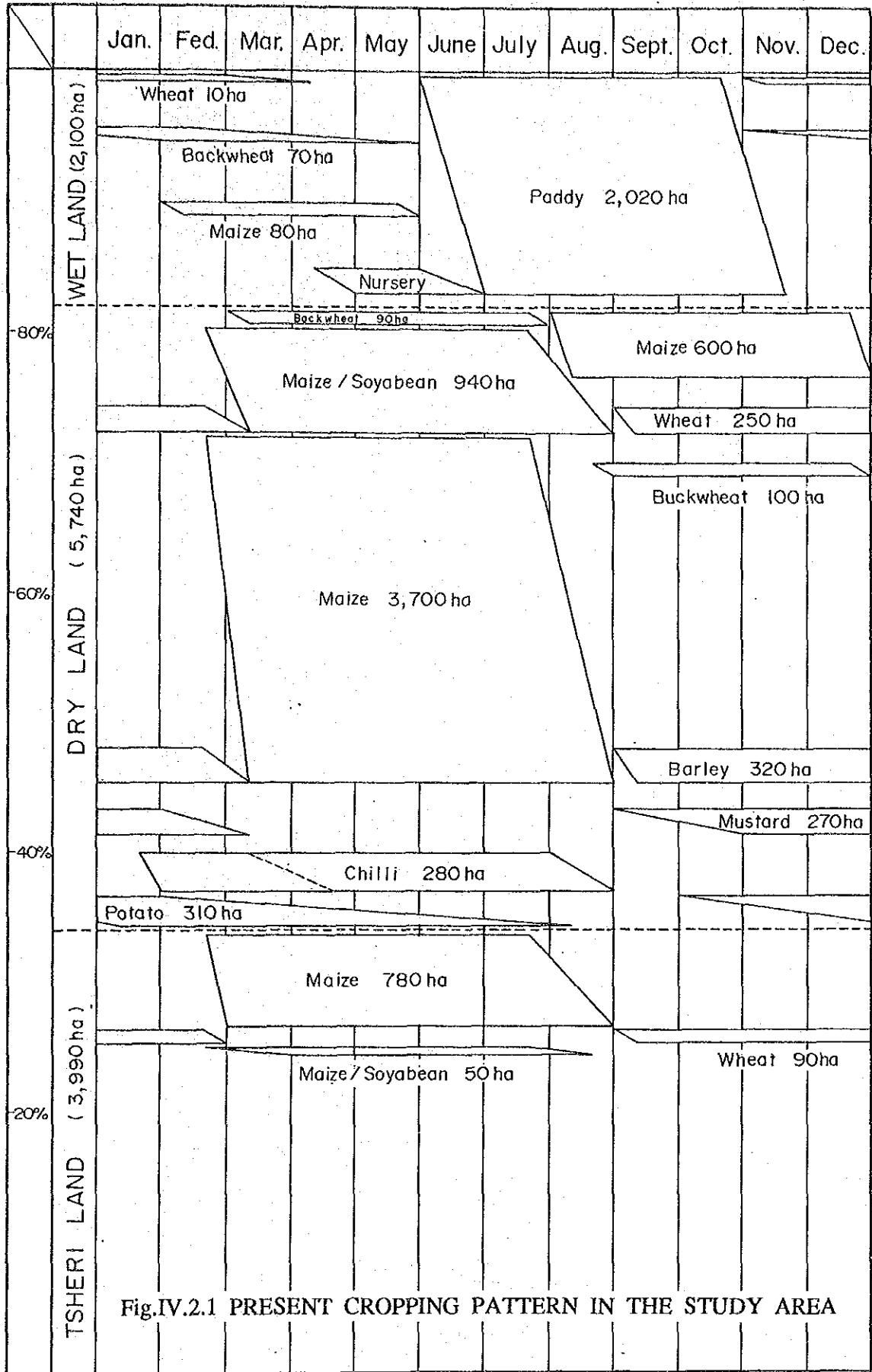


Fig.IV.2.1 PRESENT CROPPING PATTERN IN THE STUDY AREA

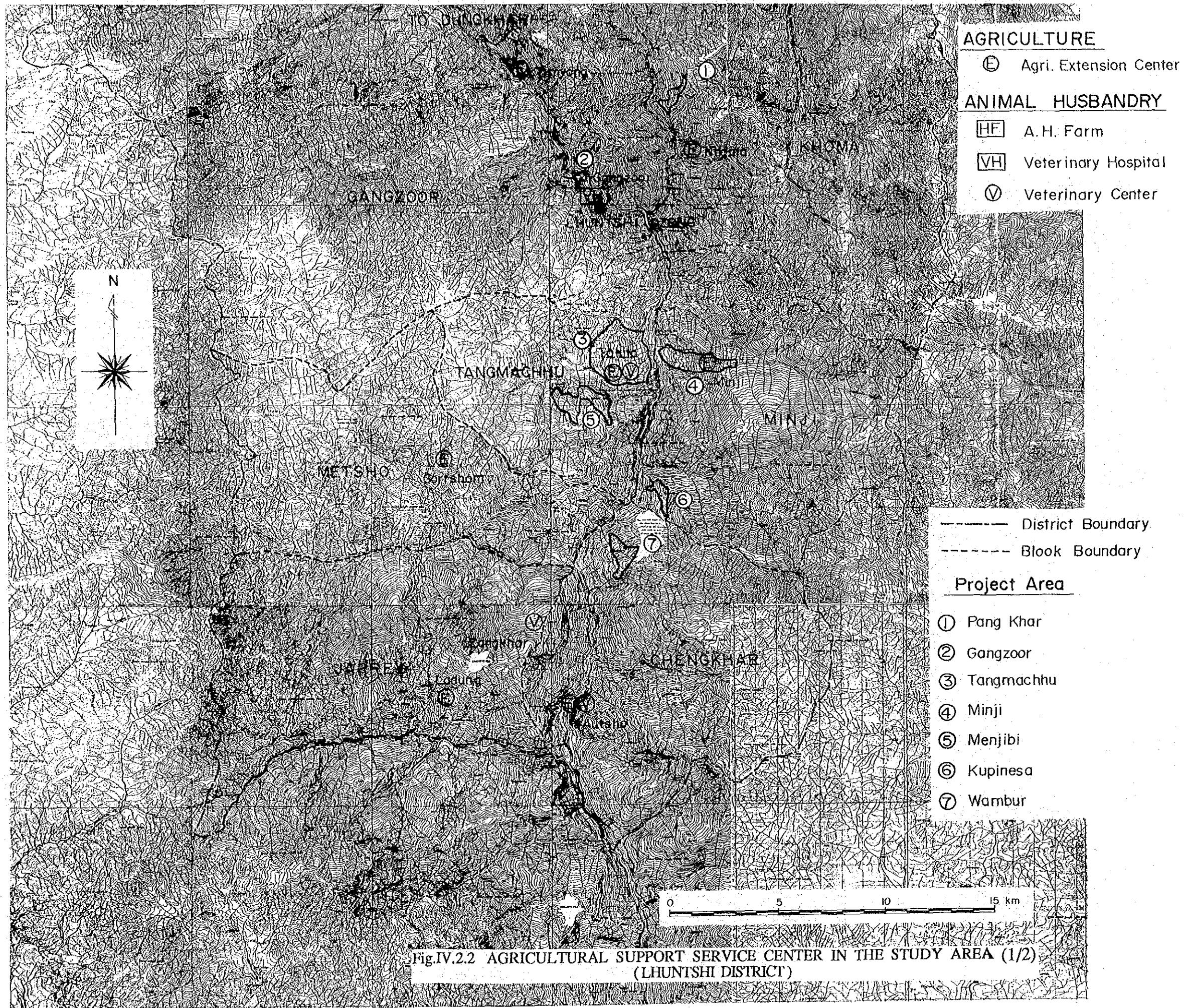


Fig.IV.2.2 AGRICULTURAL SUPPORT SERVICE CENTER IN THE STUDY AREA (1/2)
 (LHUNTSHI DISTRICT)

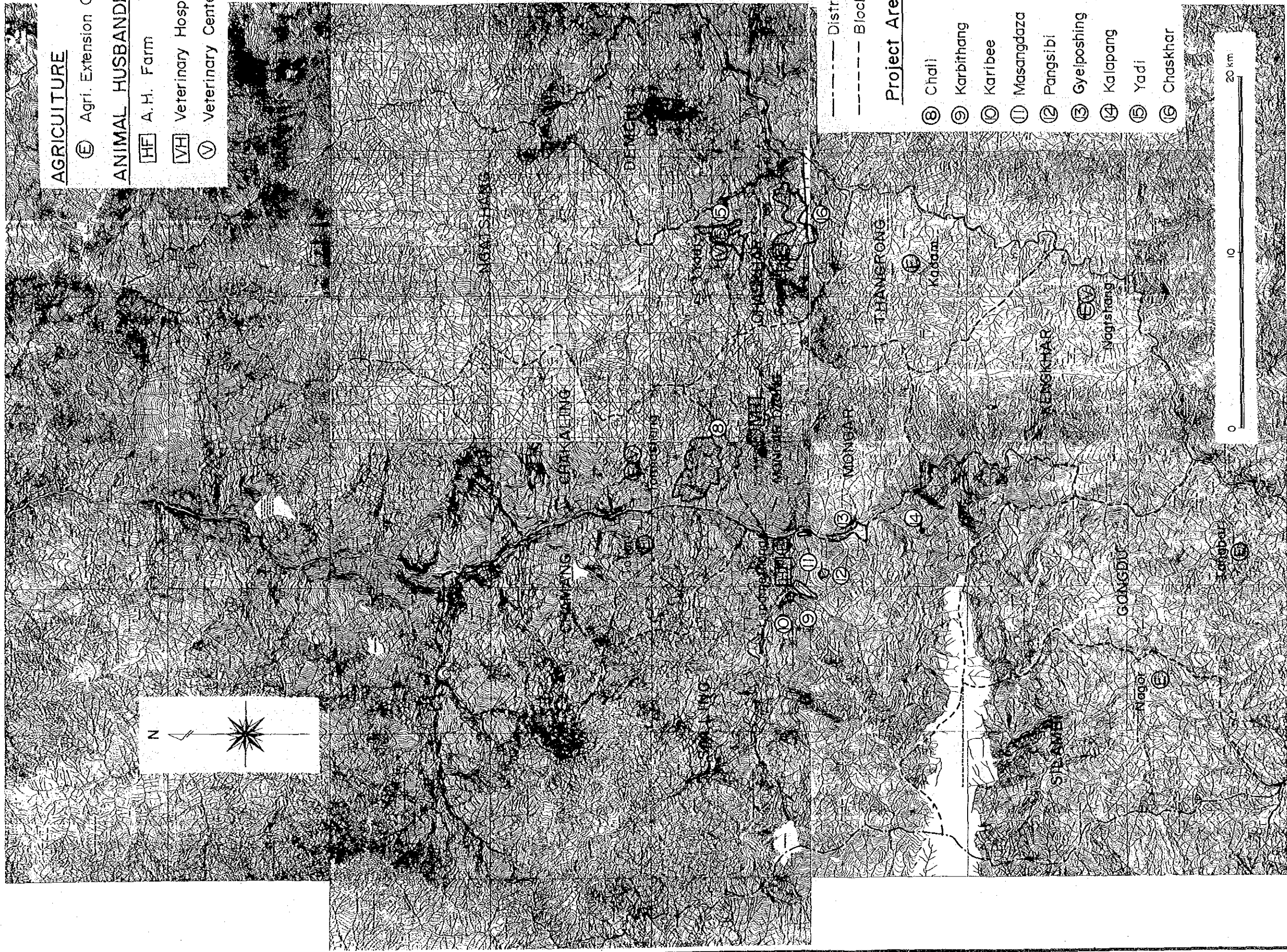


Fig.IV.2.2 AGRICULTURAL SUPPORT SERVICE CENTER IN THE STUDY AREA (2/2)
 (MONGAR DISTRICT)

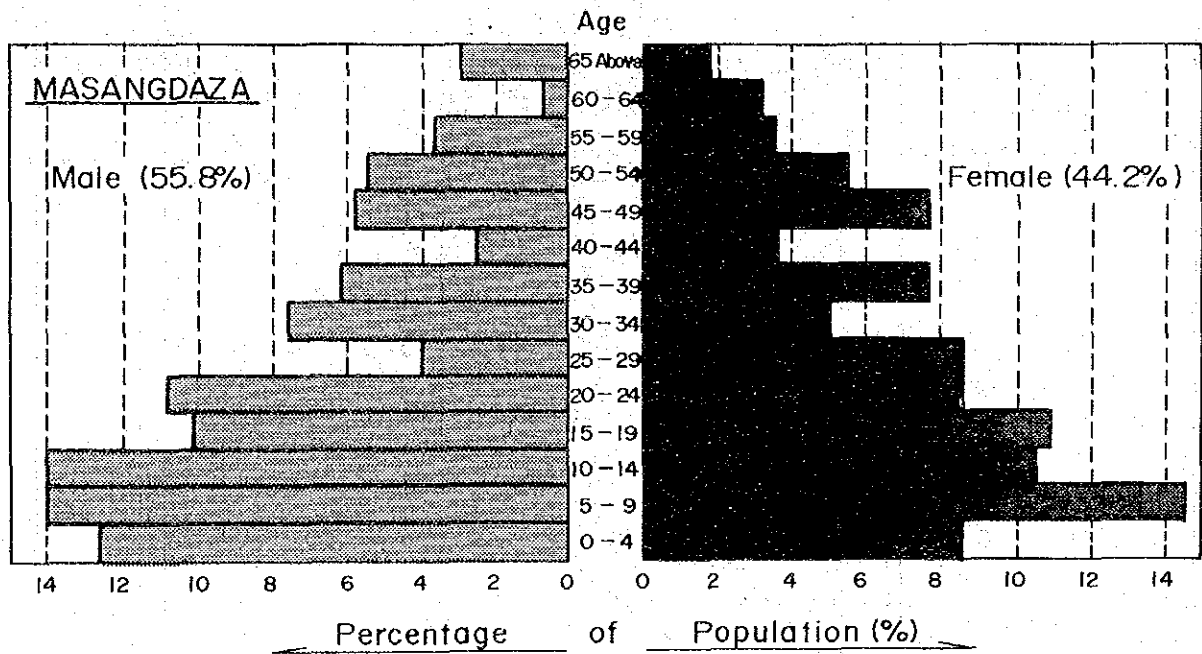
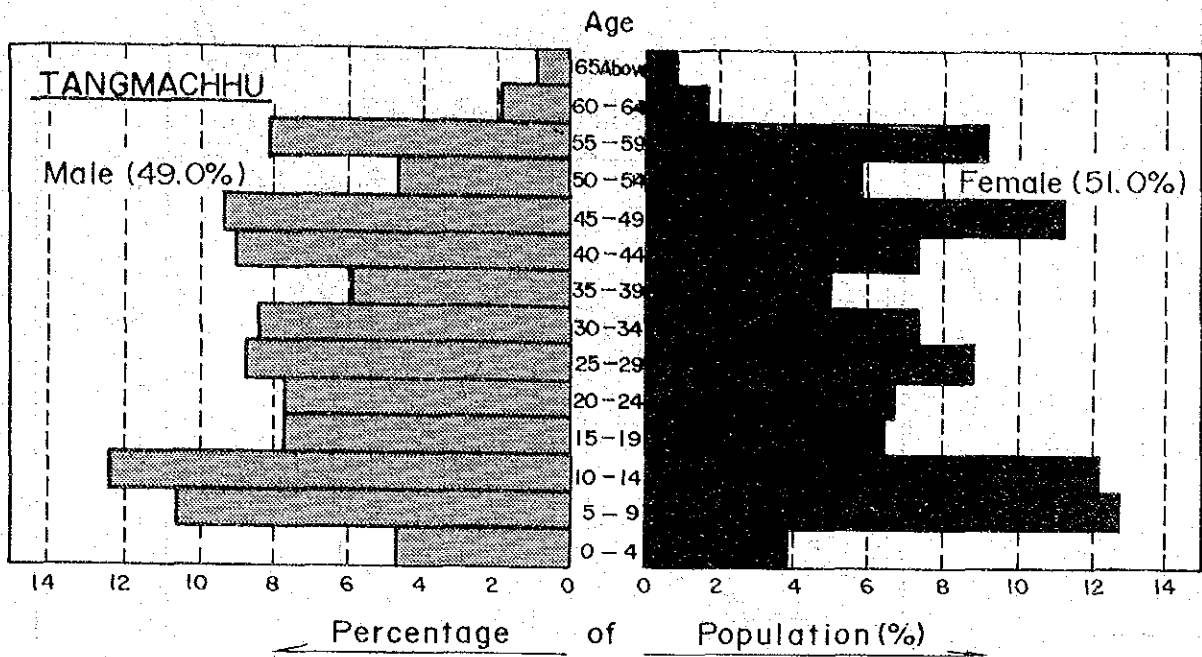


Fig.IV.2.3 POPULATION PYRAMID IN THE MODEL PROJECT AREA

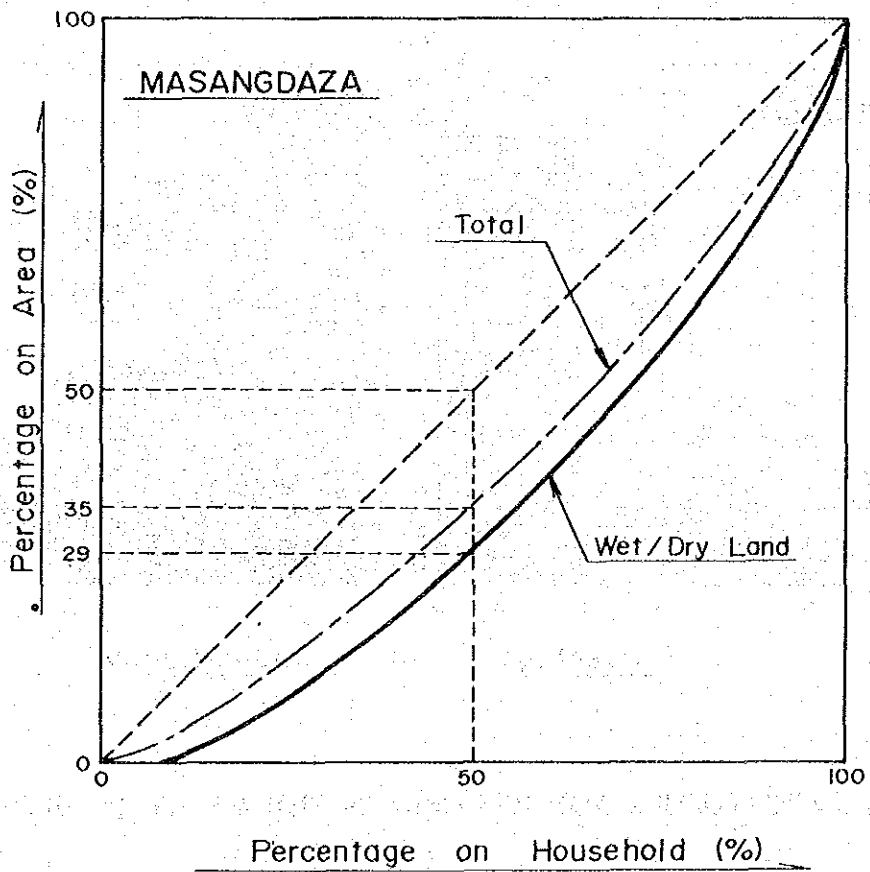
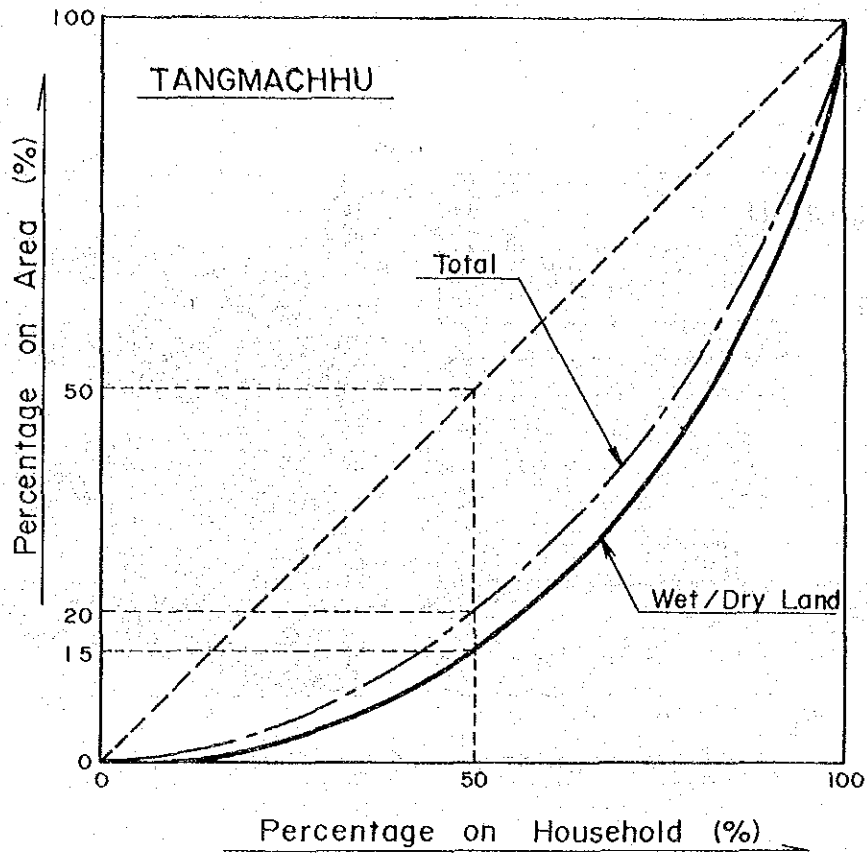


Fig.IV.2.4 LAND HOLDING STATUS IN THE MODEL PROJECT AREA

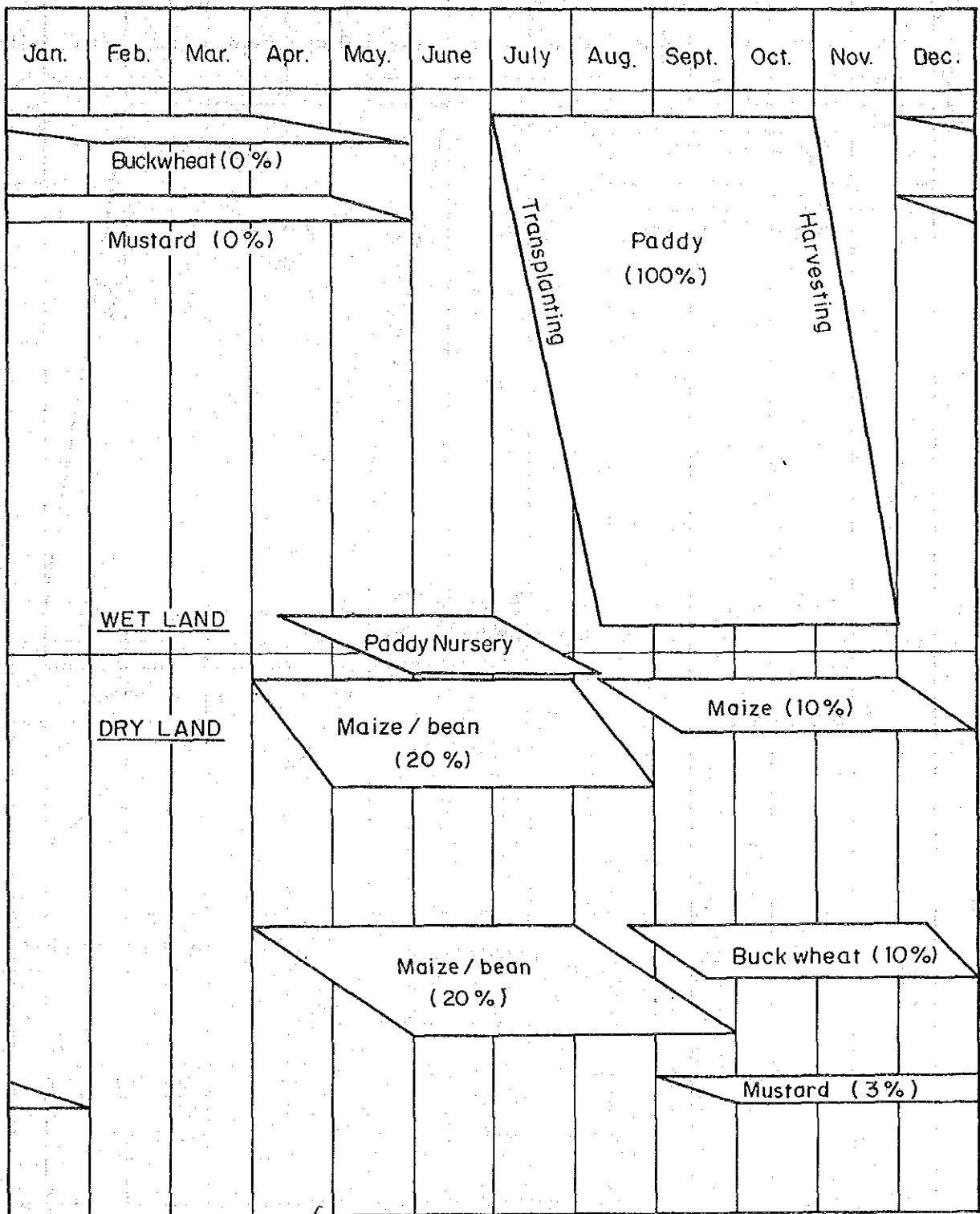


Fig.IV.2.5 PRESENT CROPPING PATTERN IN THE MODEL PROJECT AREA (1/2)
(TANGMACHI)

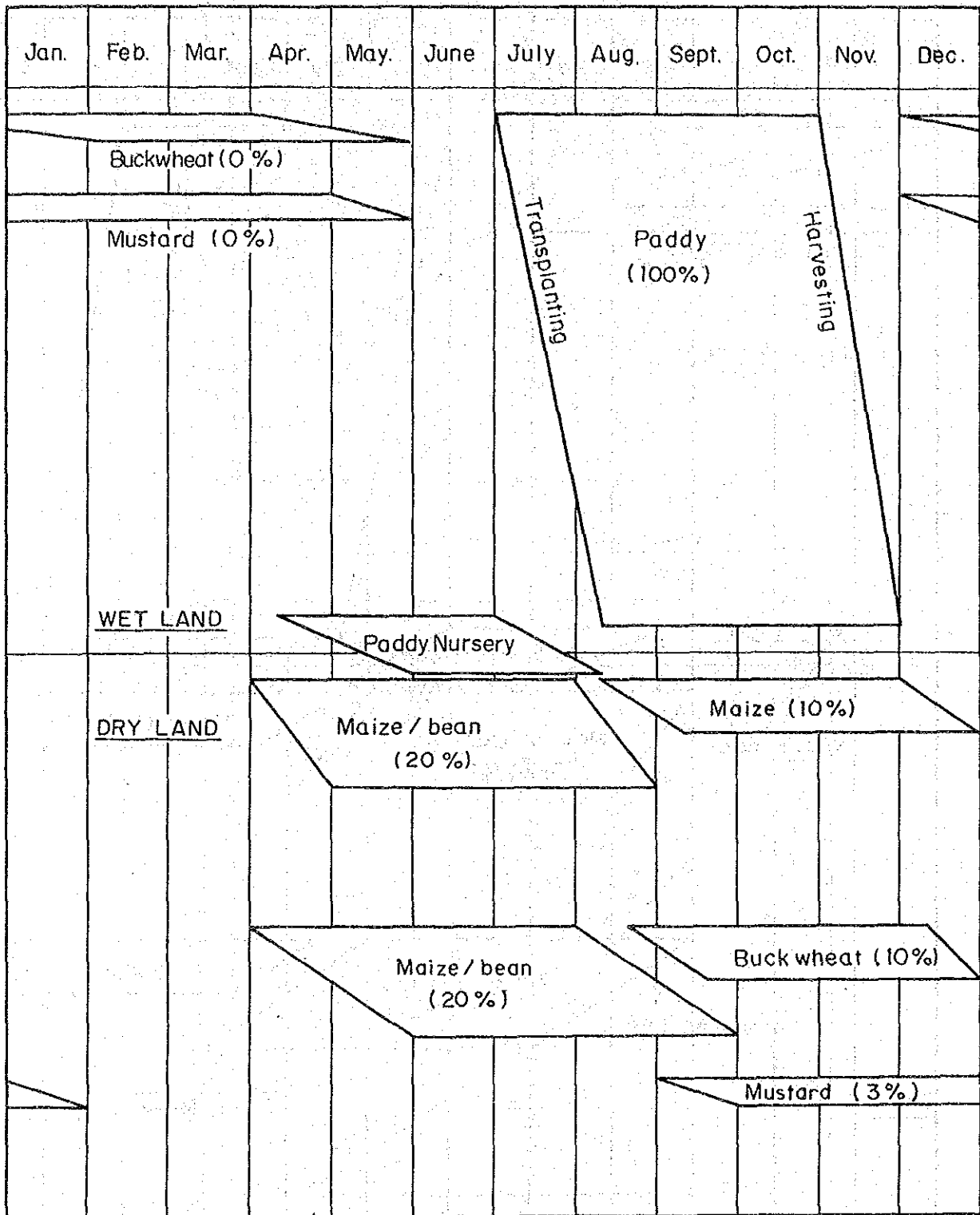


Fig.IV.2.5 PRESENT CROPPING PATTERN IN THE MODEL PROJECT AREA (2/2)
(MASANGDAZA)

METEOROLOGICAL DATA AT LINGMTHANG STATION

(EL.640m, 10 days basis data during 1985 to 1987)

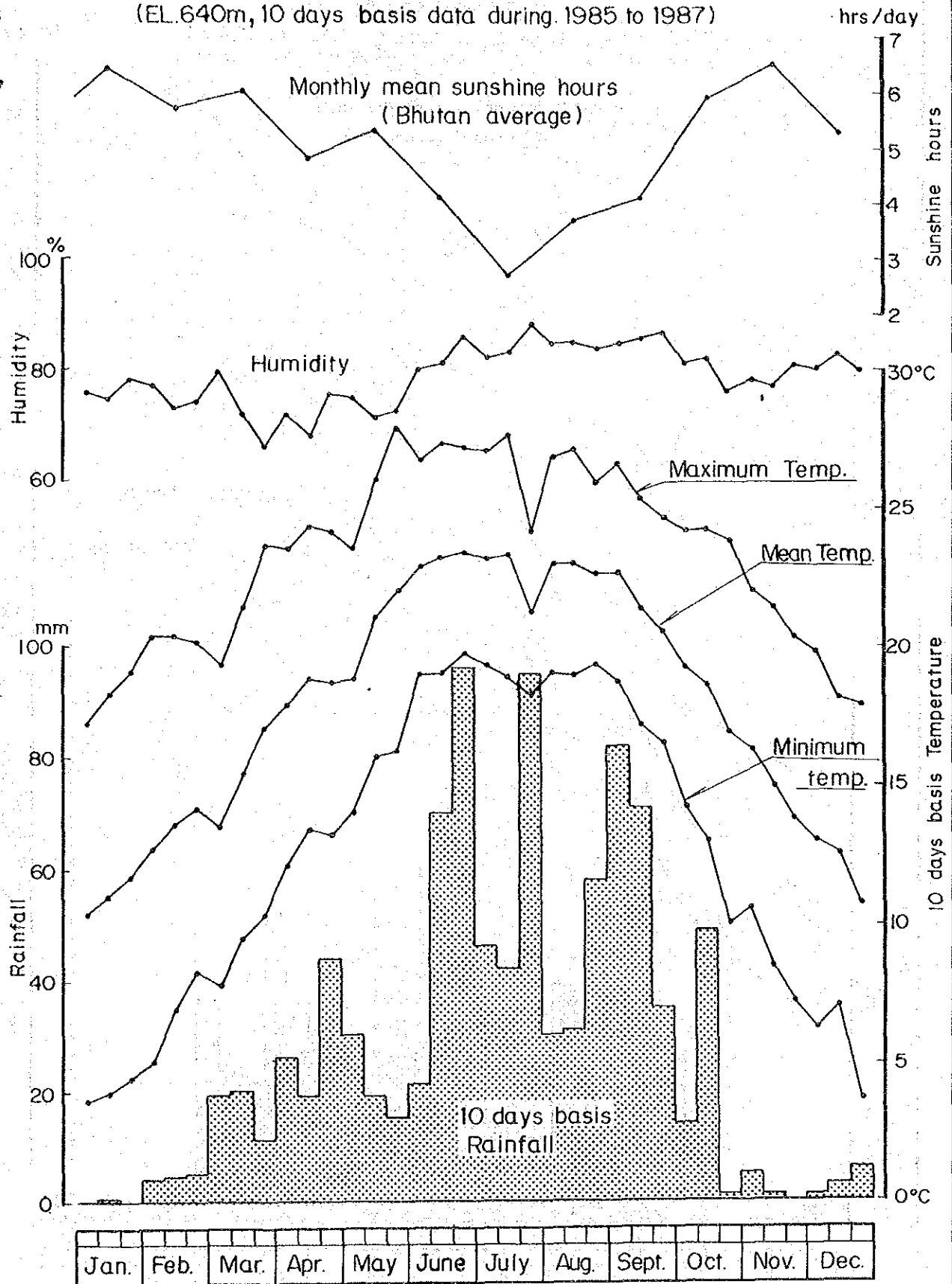


Fig. IV. 3.1 METEOROLOGICAL CONDITION IN THE MODEL PROJECT AREA (1/2 MASANGDAZA)

METEOROLOGICAL DATA AT TANGMACHHU STATION

(EL. 1,700^m, 10 days basis data during 1985 to 1987)

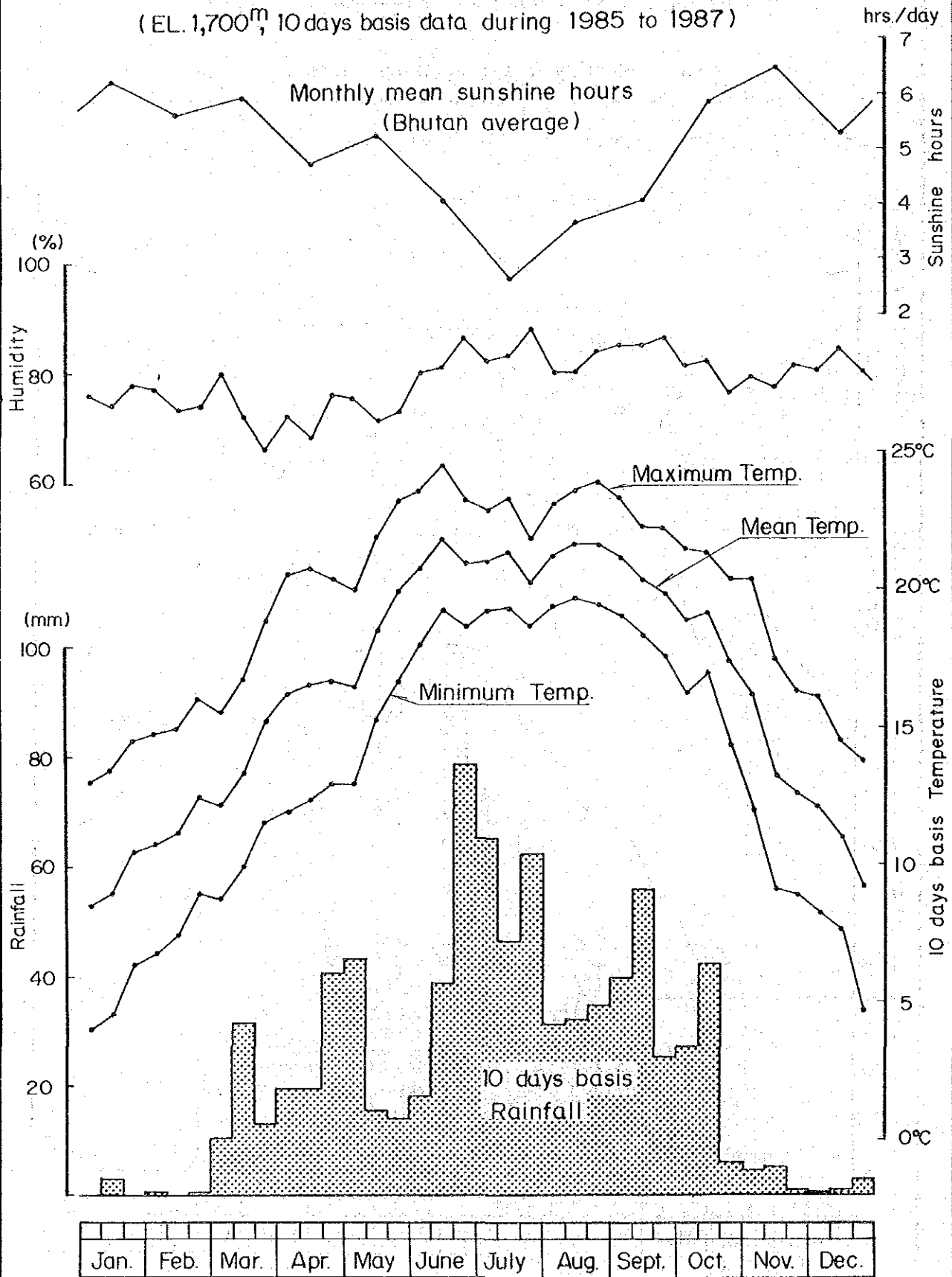


Fig IV.3.1. METEOROLOGICAL CONDITION IN THE MODEL PROJECT AREA (2/2 TANGMACHHU)

MINIMUM AND MEAN TEMPERATURE AT DIFFENT ALTITUDE IN TANGMACHHU

(Estimated on the basis of the Data in the Tongmachhu Meteo Station)

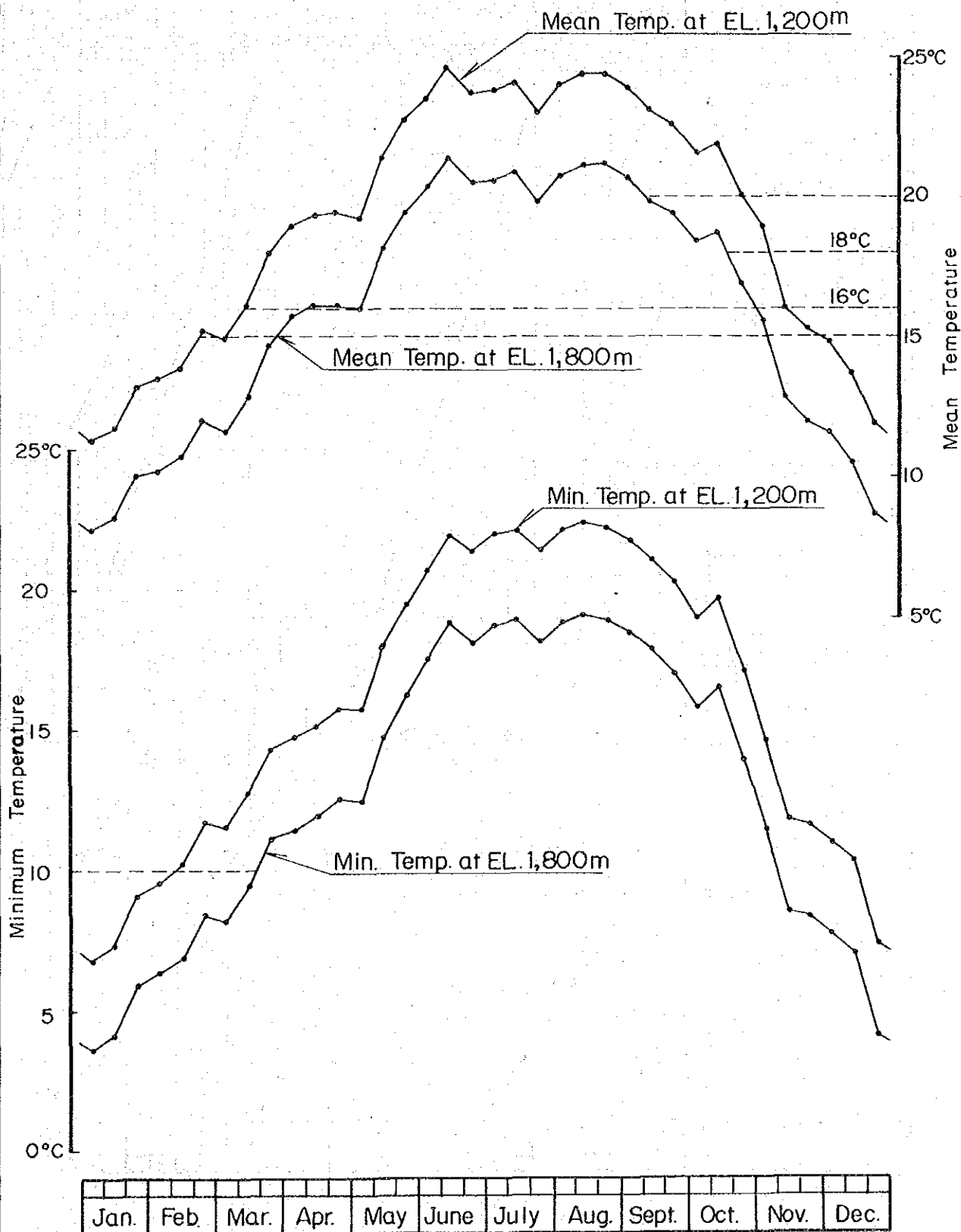


Fig. IV.3.2 MINIMUM AND MEAN TEMPERATURE BY ALTITUDE IN THE TANGMACHHU MODEL PROJECT AREA

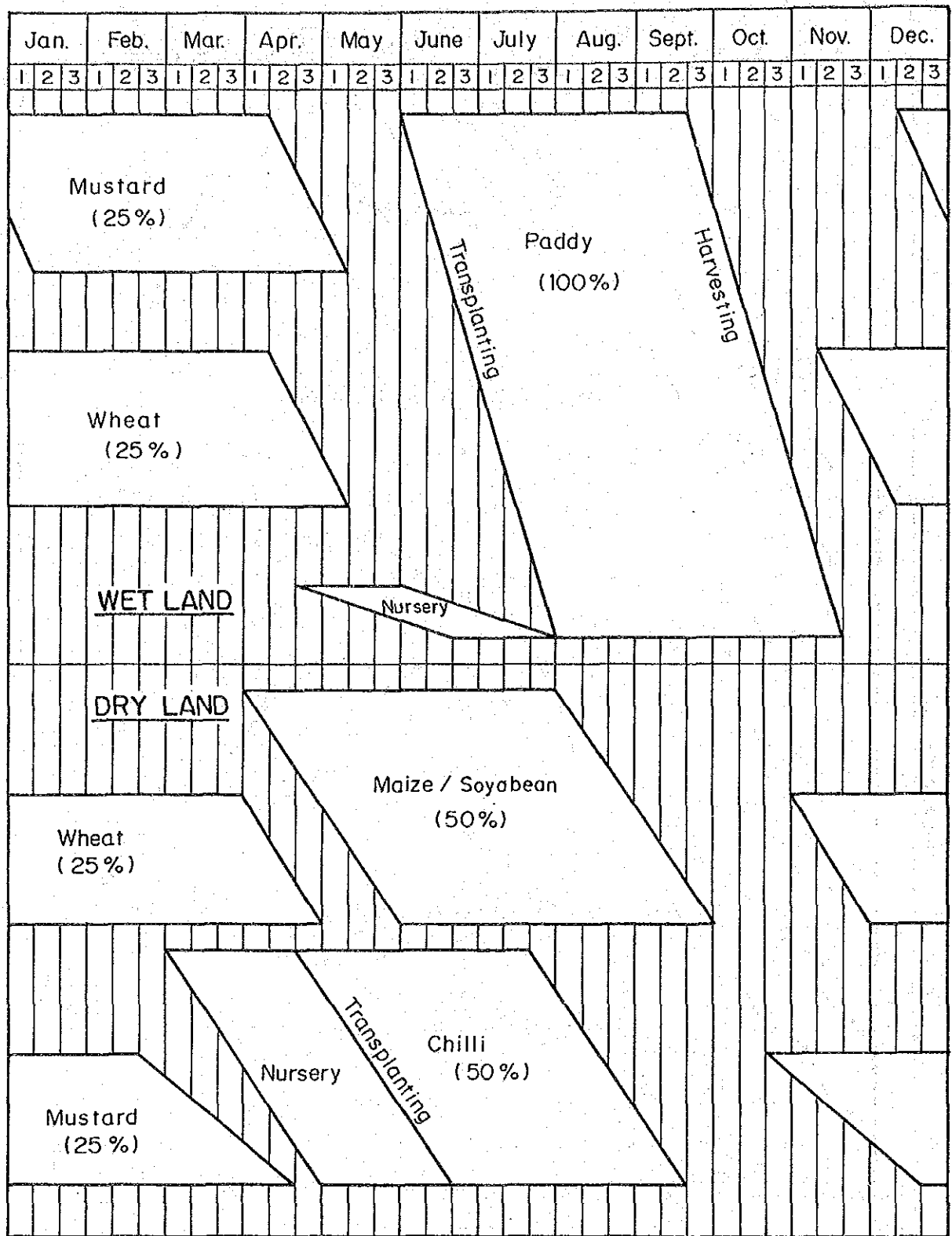


Fig.IV.3.3 PROPOSED CROPPING PATTERN IN THE MODEL PROJECT AREA (1/2) (TANGMACHHU)

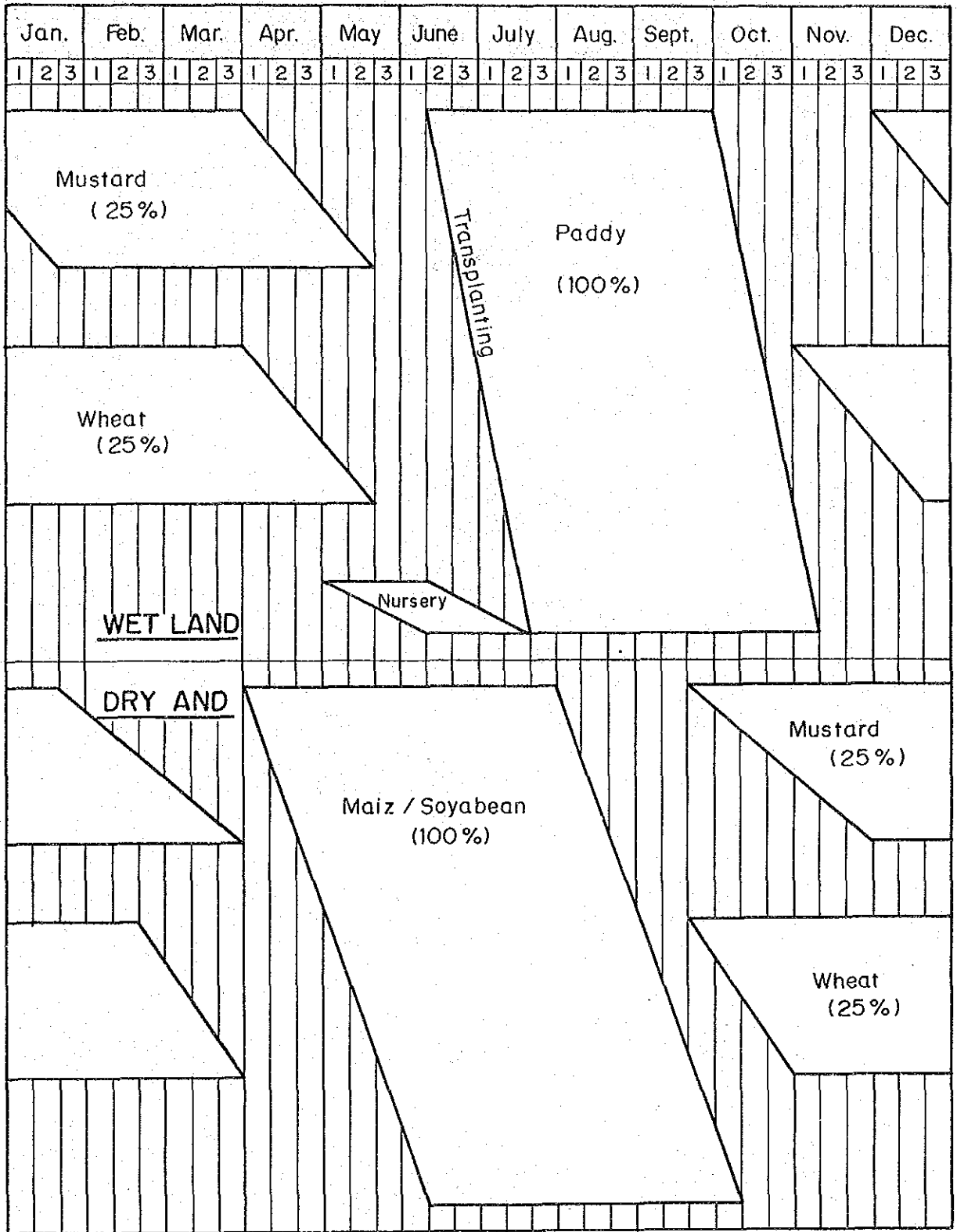


Fig.IV.3.3 PROPOSED CROPPING PATTERN IN THE MODEL PROJECT AREA (2/2)
(MASANGDAZA)

