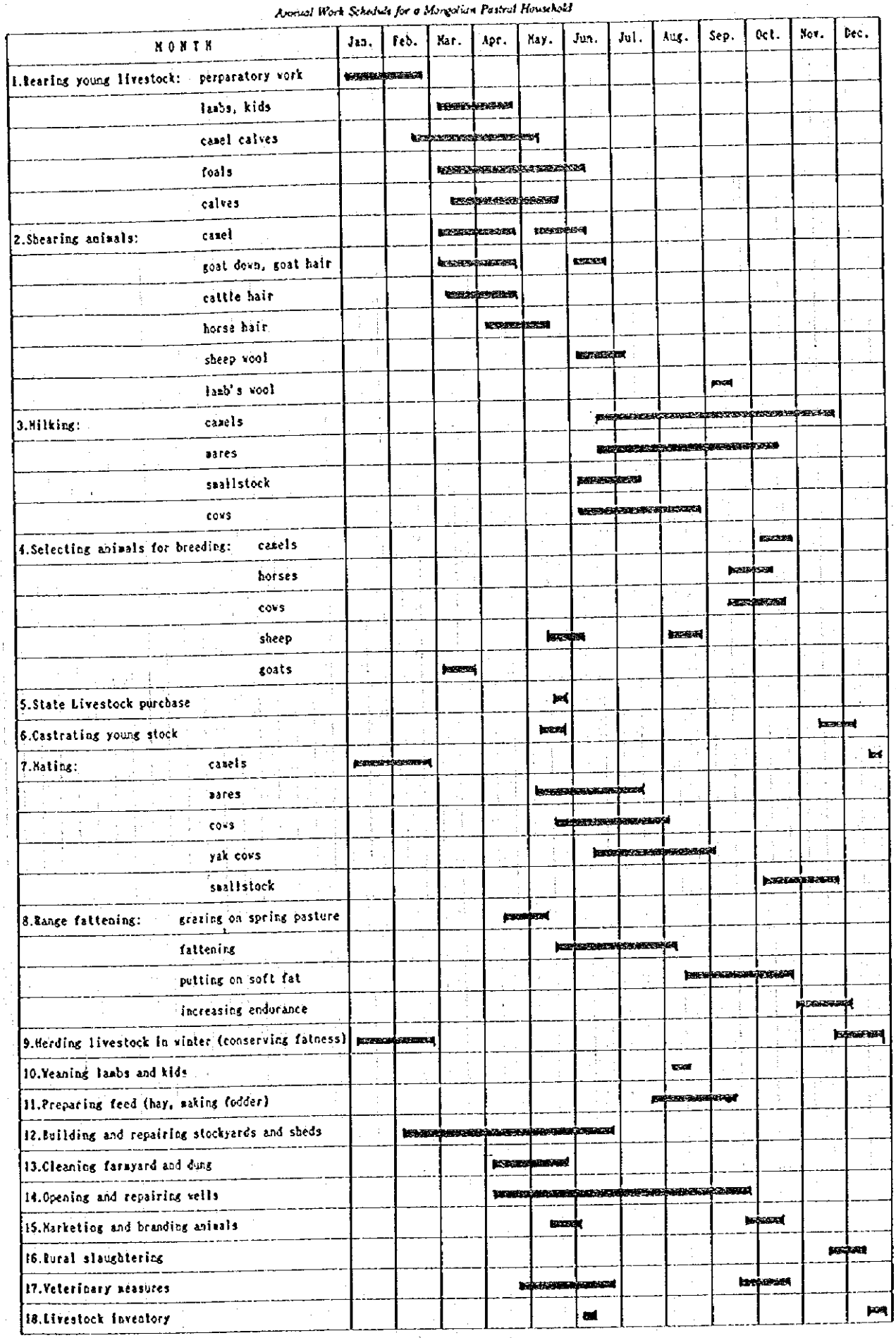
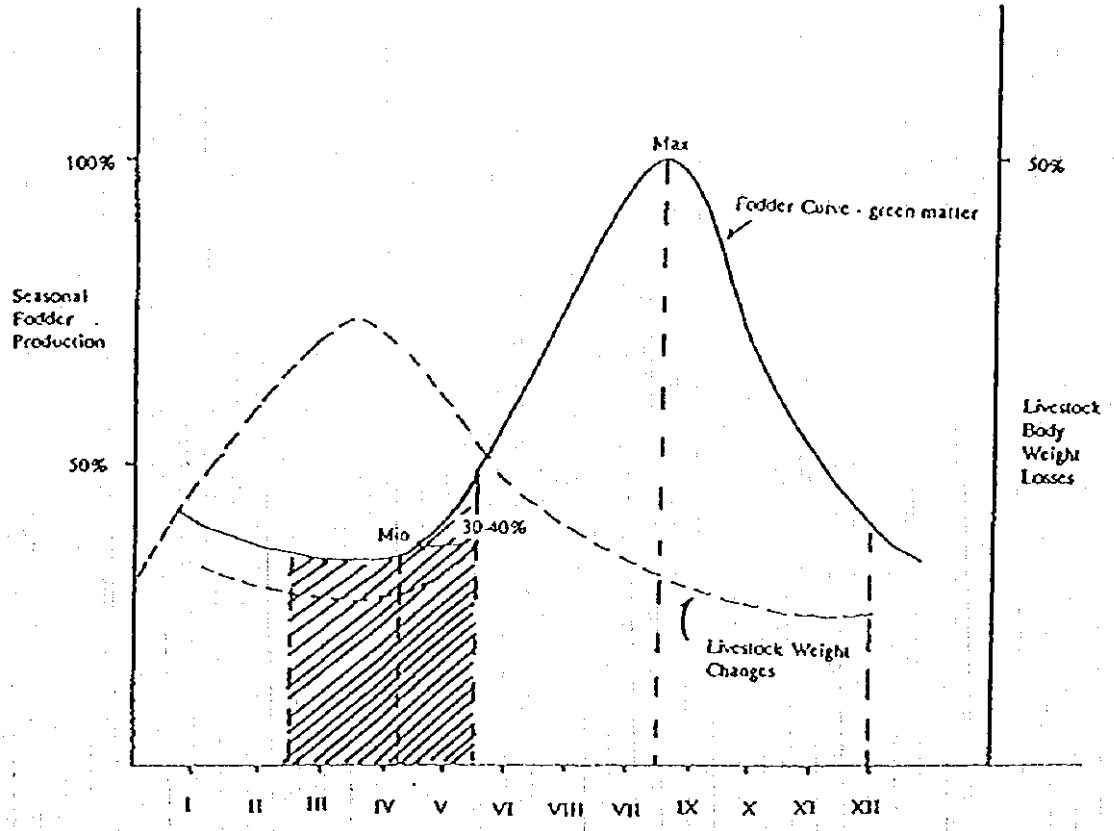
Figure-3.4.3.5 Annual Work Schedule for a Mongolian Nomadic Household

Annual Work Schedule for a Mongolian Pastral Household



Source:MOFA

Figure-3.4.3.6 Seasonal Fluctuations of Livestock Body Weight in Mongolia

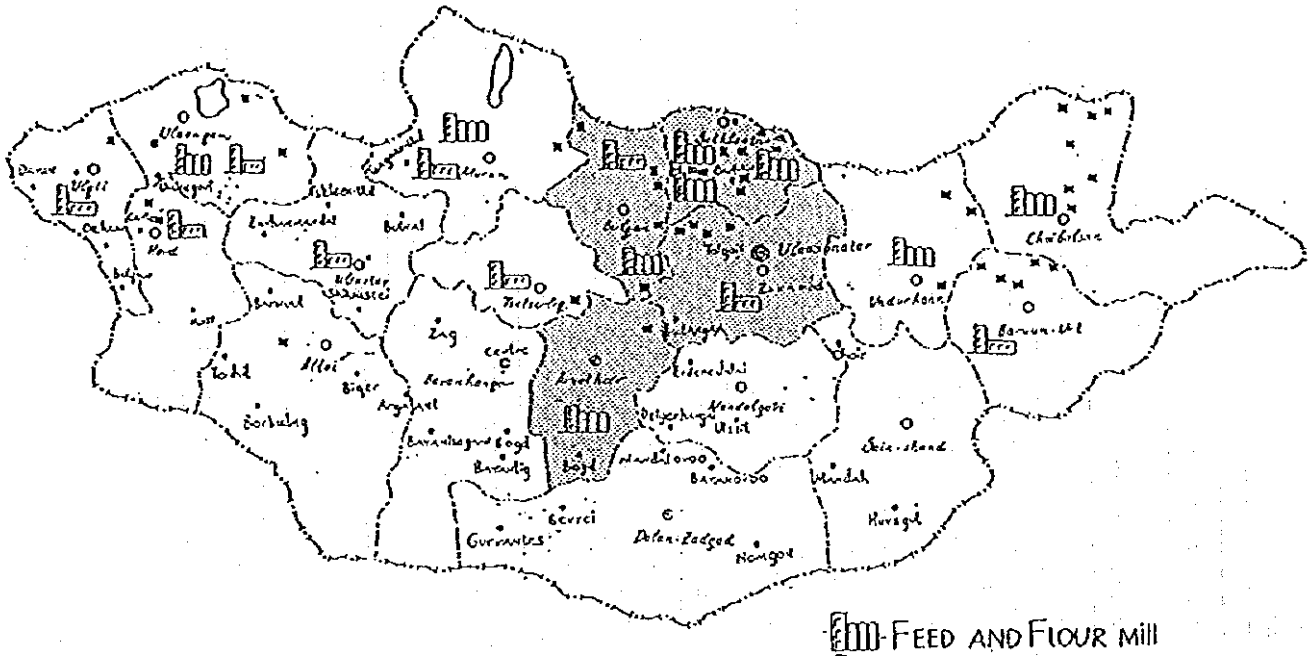


Critical Season - very changeable
- cold temps rising but still cold nights
- snow
- dusty winds in Gobi 30m/sec 40m/sec

NB:Calving period co-incides with critical season

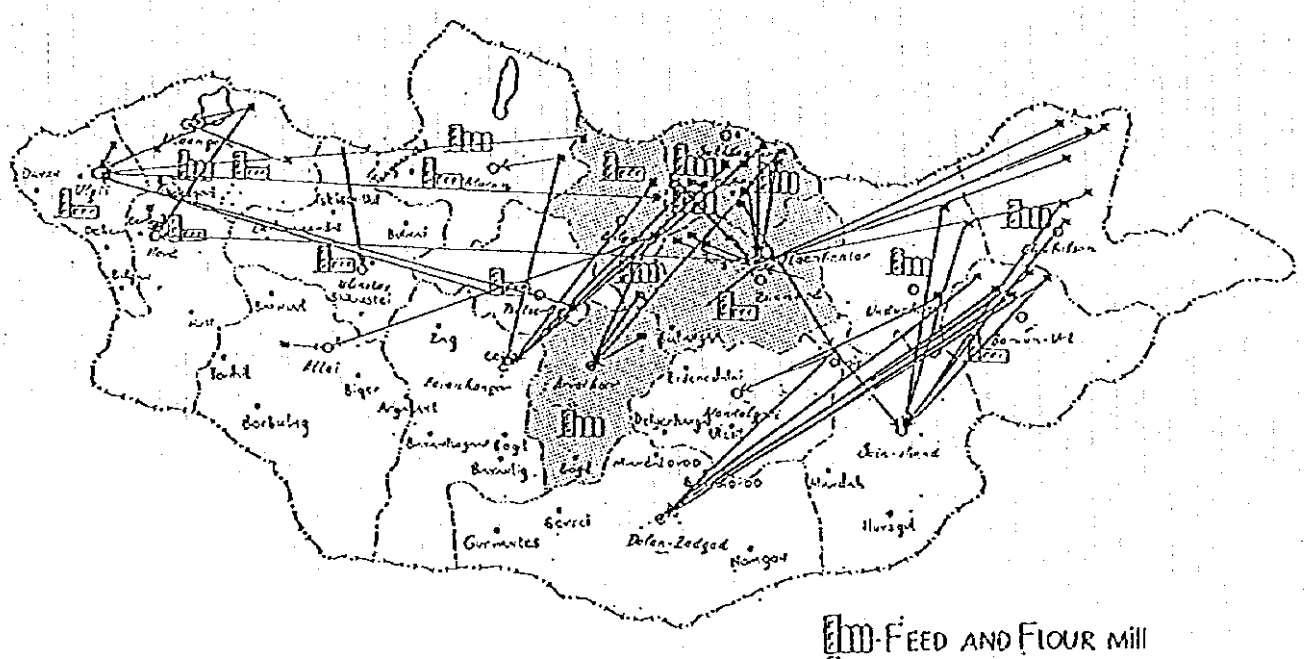
Source:Research Report No.6
「Policy Alternatives For Livestock Development in Mongolia (PALD)」

Figure-3.4.3.7 Locations of Feedmills, Haymaking Areas and SEFF Distribution Points /August.1992./



FEED AND FLOUR MILL
FEEDMILL AT FARMS
HAY MAKING AREA FOR S.E.F.F.
S.E.F.F. DISTRIBUTION POINTS
Study Area

Figure-3.4.3.8 Distribution of Hay by SEFF /AUGUST, 1992/

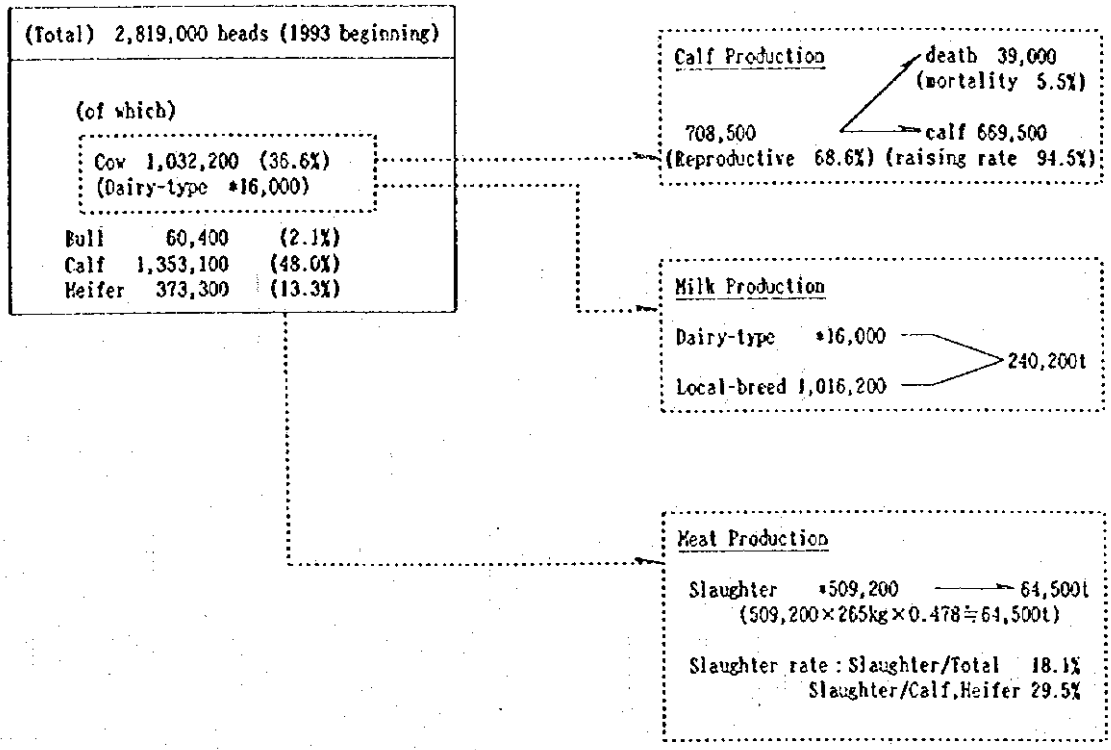


FEED AND FLOUR MILL
FEEDMILL AT FARMS
HAY MAKING AREA FOR S.E.F.F.
S.E.F.F. DISTRIBUTION POINTS
Study Area

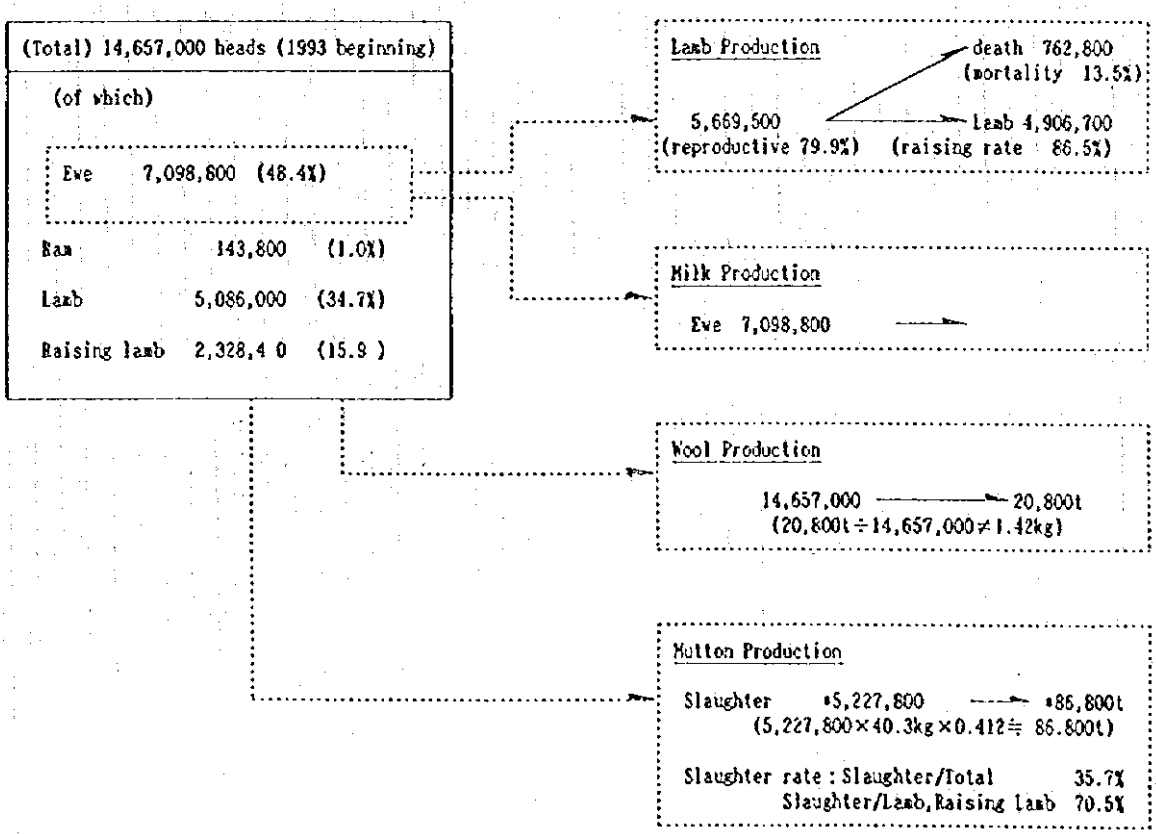
Source:ADB (Feeds Improvement Project Report)

Figure-3.4.3.9 Flow-chart of Livestock Numbers and Livestock Products (1993)

1. (Cattle~1993 in Mongolia)

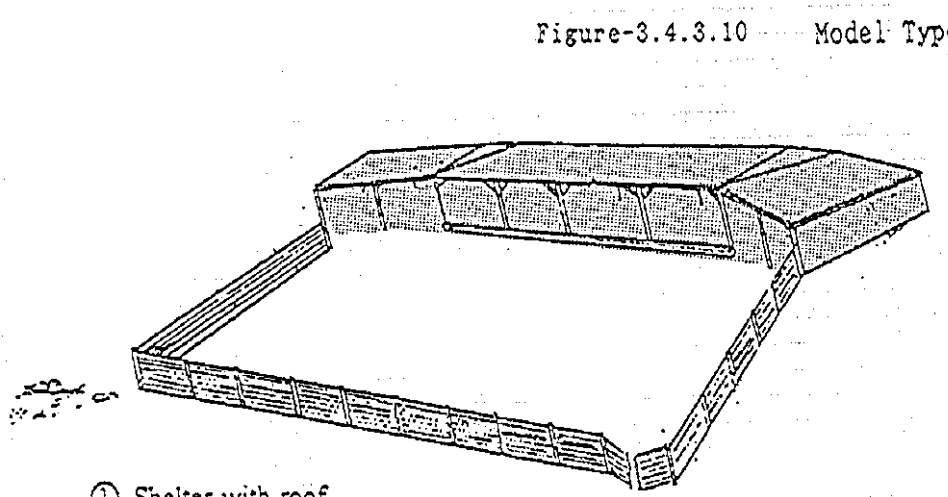


2. (Sheep~1993 in Mongolia)

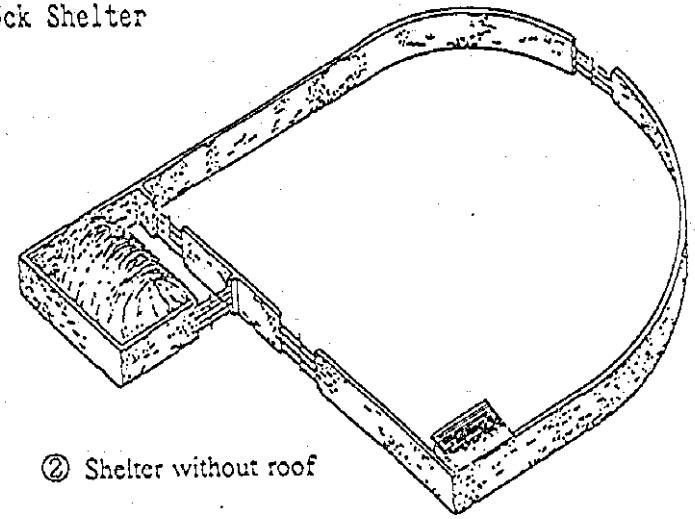


Notes: ① Made from Statistical Year Book 「Mongolian Economy and Society in 1993」
② * mark means study team's estimation

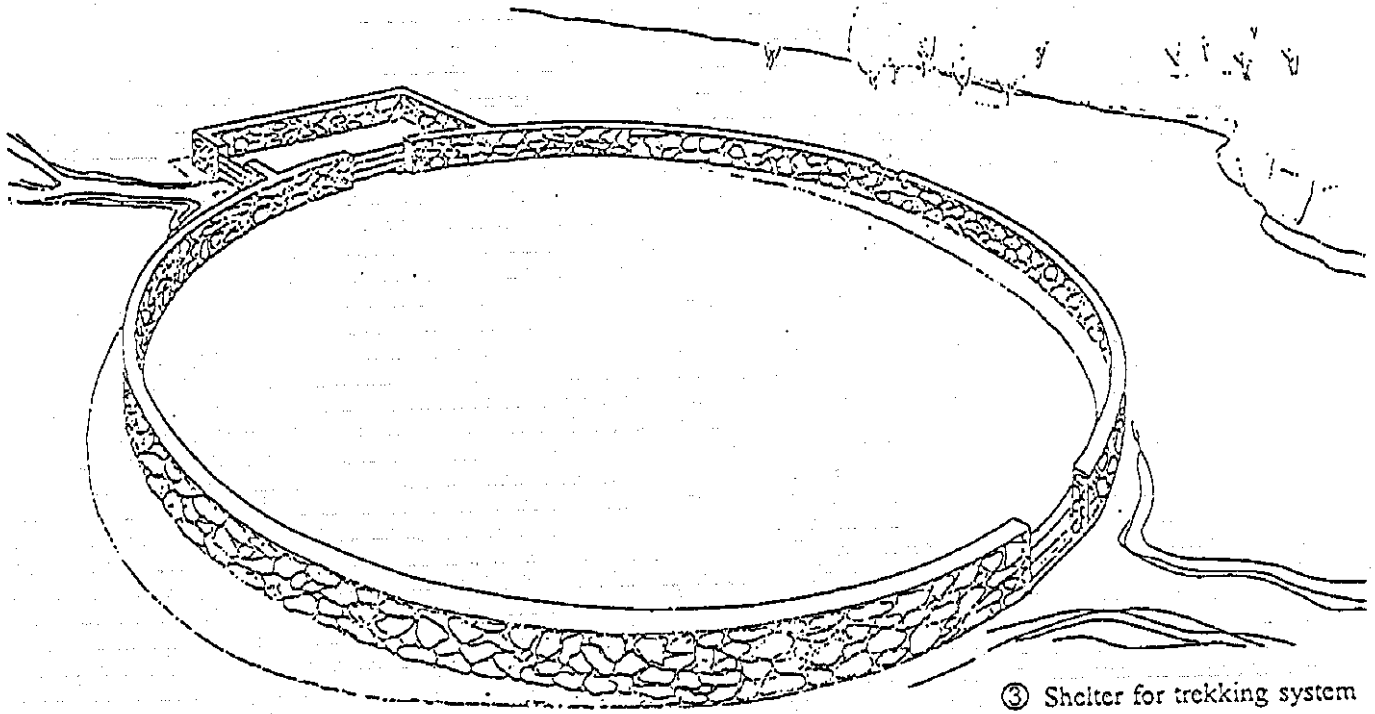
Figure-3.4.3.10 Model Type of Livestock Shelter



① Shelter with roof



② Shelter without roof



③ Shelter for trekking system

Source:MOFA

④Winter shelter for 100 cows

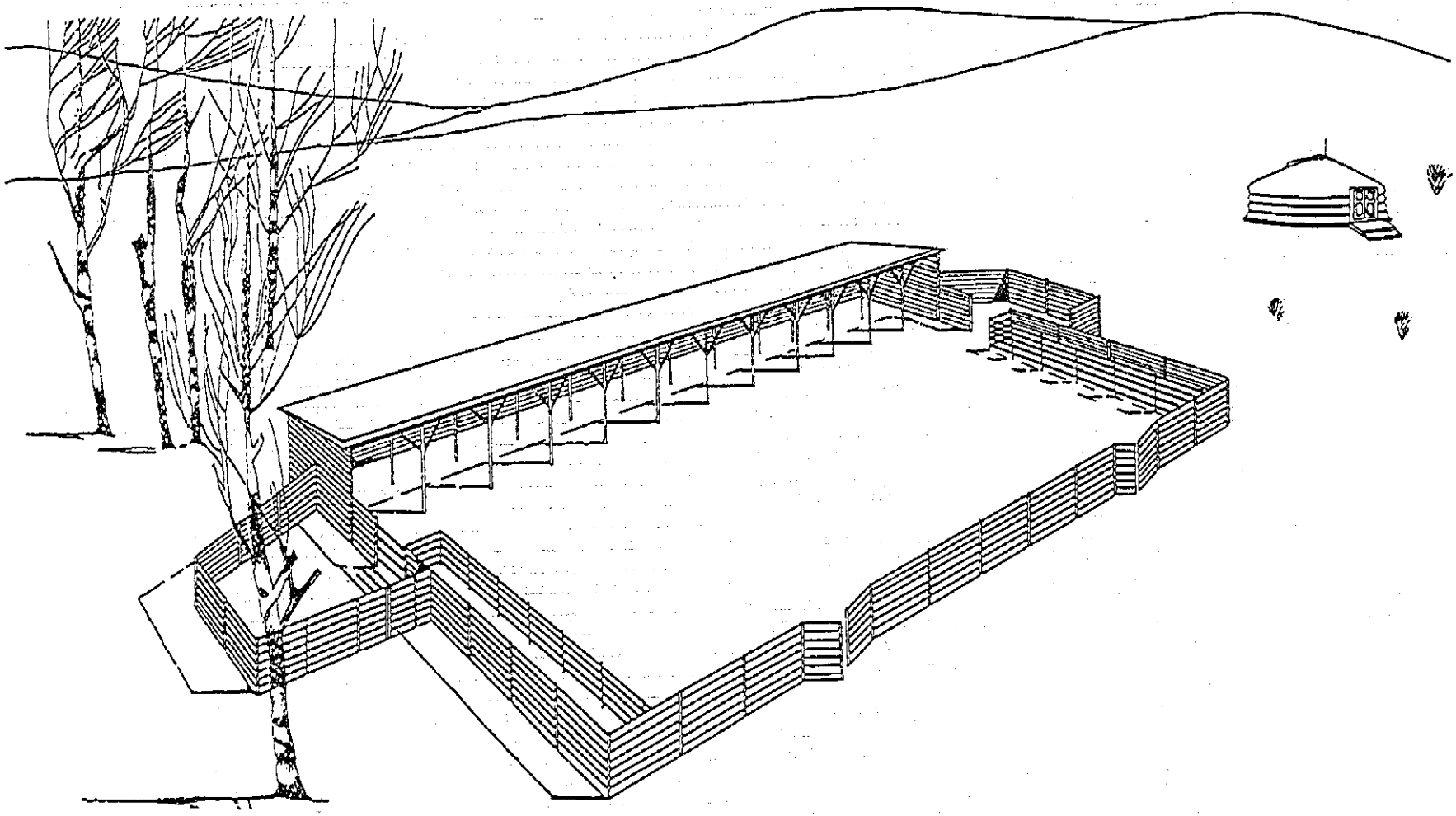


Table 3.4.4.1 Output of Main Agricultural Products

(Unit: thousand tons)

	1989	1990	1991	1992	1993	1994
Meat, slaughter weighat	239.6	248.9	281.2	251.2	216.1	203.9
(index 1989=100)	100	104	117	105	90	85
Beef	72.8	66.2	83.8	75.7	64.5	64.4
(index 1989=100)	100	91	115	104	89	88
Mutton and goat meat	121.9	132.3	135.9	116.3	112.5	111.9
(index 1989=100)	100	109	111	95	92	92
Pork	5.5	7.9	3.8	1.8	0.7	0.7
(index 1989=100)	100	144	69	33	13	13
Sheep's wool	19.4	21.1	21.5	21.0	20.8	19.6
(index 1989=100)	100	109	111	108	107	101
Milk	319.3	315.7	311.3	308.1	292.9	312.5
(index 1989=100)	100	99	97	96	92	98
Eggs, mln pieces	35.8	38.0	25.5	18.6	10.0	3.6
(index 1989=100)	100	106	71	52	28	10
Cereals	839.1	718.3	595.0	493.9	479.5	330.7
(index 1989=100)	100	86	71	59	57	39
Wheat	686.9	596.2	538.2	453.2	450.2	321.9
(index 1989=100)	100	87	78	66	66	47
Potatoes	155.5	131.1	96.5	78.5	60.1	54.0
(index 1989=100)	100	84	62	50	39	35
Vegetables	59.5	41.7	22.7	16.4	22.7	22.8
(index 1989=100)	100	70	38	28	38	38
Milk,Dairy products(mln.L)	62.0	59.6	50.6	27.7	13.0	4.9
(index 1989=100)	100	96	82	45	21	8

Source : Mongolian Economy and Society in 1994,
Statistical Office of MONGOLIA,1995

Table 3.4.4.2 Output of Certain Categories of Agriculture and Livestock Products

Items	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Scoured wool,thous.t	11.3	10.7	10.4	9.6	10.1	9.7	7.2	7.1	3.5	2.1
Carpet,thous.sq.m	1585.6	1680.3	1809.4	1813.8	2128.1	1971.2	1400.2	1037	1000.1	681.5
Knited goods,thous.pieces	2824.7	3094.8		3042.2	4110.5	4248.5	2808.7	1411.7	990.7	513.8
Felt,thous.m	623.9	636.8			849.7	745.1	583.2	494.8	241.4	107.7
Felt boots,thous.pairs	452.2	451.9	459.8	486.2	592.3	588.5	444.2	409.1	252.1	90.1
Woolen fabrics,thous.running m	1432.5	1510.5	1549.8	1595.1	1978.8	1111.3	736.4	705.8	289.9	76.7
Hides large,thous.t	0.8	0.8	0.9	0.9	1.0	1.0	0.8	0.5	0.2	-
Leather boots.thous.pairs	81.0	42.7	49.5	31.4	41.6	35.7	29.5	40.1	9.4	35.0
Leather coat,thous.pieces	135.2	149.3	161.2	181.6	186.2	138.1	111.5	99.4	86.6	57.1
Meat & meat products,thous.t	62.5	63.9	64.7	62.0	61.7	57.8	49.6	25.1	17.3	11.3
Sausages,t	4051.5	4462.1	4782.1	5284.7	5824.3	5522.4	5825.4	3360	1245.3	1065.3
Flour,thous.t	175.7	185.9	193.7	196.4	199.7	189.8	174.4	181.9	175.5	127.0
Bakery goods,thous.t	65.4	68.4	68.7	69.9	66.7	63.3	60.6	60.9	46.0	33.9
Confectionery,thous.t	37.1	38.9	37.2	41.8	45.7	41.6	33.4	17.0	12.0	10.8
Milk & dairy products,mln.l	45.2	52.8	55.6	59.0	62.0	59.6	50.6	27.7	13.0	4.9
Votka,10001	6118.3	5086.8	3288.3	3498.5	4923.9	6438.4	6769.2	6686.6	-	-
Beer,10001	8851.2	6515.4	5036.6	4944.8	6720.4	6254.2	2761.2	3042.8	-	-
Mixed fodder,thous.t	156.1	141.0	156.4	177.4	212.2	119.1	102.1	82.7	77.0	33.7

Source : Mongolian Economy and Society in 1994,Statistical Office of MONGOLIA,1995

Table 3.4.4.3 State Procurement Price of Agricultural and Livestock Products and Recent Wholesale Price (togrog)

Products	Unit	Government direction					Wholsale price			
		1985	1990	Minimum price			1992.5	1993 beginning	1993 year-end	1994
				1991 Gov.	1991 MIT & MOFA	1992 Gov				
meat(camel)	ton	1200			2400		7653	30000	90000	99000
meat(horse)		370		1407			5477		95000	112000
beef	ton	2440		4953		10000	15827	40000	120000	143000
mutton	ton	2330		3680		10000	12140	40000	120000	155000
meat(goat)	ton	1960		3156		6500	9468	30000	95000	112000
pork	ton	6560			14400		28434	60000	90000	217000
chicken	ton	7200					20747	60000	90000	177000
camel's wool	ton	18700	24310		48620		58000	170000	200000	365000
wool	ton	7000	9109	10738	11382		18400	45000	100000	173000
goat down	ton	72000	100800	267120			300000	700000	2800000	6217000
goat's wool	ton	1200		3600			10800	12000	40000	45000
egg	piece	5					6	12	20	53
honey	ton	3000					100000	200000	400000	1031000
milk(cow)	1000L	3500					7200	18000	65000	74000
milk(mare)	1000L	3500					4000	7000	28000	99000
milk(camel)	1000L	1500					3000	5000	20000	124000
butter	ton	13730		27460	35830		100000	300000	400000	511000
skin(camel)		31	56	64	64	80	80	250	400	400
skin(horse)		60	85	120	120	150	260	350	560	580
skin(cattle)		49.5	122.4	153	153	248	420	550	800	3000
skin(sheep)		18.5	28	37	37	90	250	450	750	1300
skin(goat)		19.4	25	38	38	74	180	350	650	1500
wheat	ton	630		900	1200		4200	23900	38000	35000
barley	ton	450			935		3100	22760	36000	25000
potato	ton	850		1020	1718		4500	22000	33000	36000
cabbege	ton	1060			2120		3250	19900	24100	28000
carrot	ton	895			1790		3600	27000	27000	31000
turnip	ton	737			1474		3600	25000	25000	29000
onion	ton	2220			4440		7300	48500	48500	100000
garlic	ton	6440			12880		18500	100000	120000	200000
tomato	ton	5000			10000		18900	120000	150000	360000
cucumber	ton	4780			9560		17600	115000	115000	320000
hay	ton	150			300		1000	2500	5900	6000
fodder	ton	362			780		3400	22000	42000	42000
green fodder	ton	230			460		1075	2620	5000	9819
silage	ton	70			140		350	3640	6900	6900

Source : MOFA

Table 3.4.4.4 Retail Price of Main Foodstuffs at the Free Market (Togrog)

Foodstuffs	Unit	1991	1992					1993					1994		
		1.16	Jan.- Mar.	Apr.- Jun.	Jul.- Sept.	Oct.- Dec.	Annual Ave.	Jan.- Mar.	Apr.- Jun.	Jul.- Sept.	Oct.- Dec.	Annual Ave.	Jan.- Mar.	Apr.- Jun.	Jul.- Sept.
beef	kg	12	45	50	75	115	71	113	263	278	260	229	320	360	400
mutton	kg	15	50	55	95	130	83	133	268	292	277	242	320	360	400
pork	kg	30	35	40	63	95	56	90	227	213	275	204	320	400	500
ham	kg	21.6	100	110	130	250	148	315	540	623	627	527	900	1200	1400
milk	L	4	15	16	19	70	30	74	75	70	88	77	120	90	150
butter	kg	27	250	250	258	350	277	508	510	500	443	491	420	450	500
yoghurt	L	6	25	26	24	43	30	55	75	82	90	75	120	120	130
flour(1)	kg	3.2	25	35	40	46	37	63	63	65	88	70	110	120	120
flour(2)	kg	2	18	25	30	29	26	30	35	45	68	45	80	90	90
bread	lb.	3.4	10	10	17	28	16	37	50	70	77	59	77	77	77
sweets	kg	8.4	40	44	68	112	65	140	150	105	257	185	300	350	350
biscuit	kg	13	55	63	81	123	81	150	180	190	240	190	300	340	380
rice	kg	4.4	70	90	110	147	104	122	60	70	82	89	90	110	120
potato	kg	4	40	37	20	24	30	33	57	100	77	67	130	120	120
cabbage	kg	5	53	45	21	35	39	67	198	113	78	99	80	80	90
onion	kg	7.2	60	67	78	95	75	68	48	52	203	94	250	270	300
candy	kg	48	188	252	290	310	262	380	470	463	503	455	-	-	-
sugar	kg	8	127	142	139	115	131	137	155	182	188	165	260	300	300
salt	kg	2	40	41	42	38	40	50	50	55	58	52	80	100	100
oil	kg	18	251	263	383	530	357	700	716	808	1033	814	850	850	850
egg	piece	1	7	8	7	9	8	22	22	25	31	25	45	50	50
arhi		83	450	475	648	600	542	667	667	800	983	779	920	900	900
juice		2.4	15	15	20	30	20	30	38	48	57	43	65	70	70
tea		20	460	489	667	683	575	633	580	565	900	670	800	800	800

Source : MOFA

Table 3.4.4.5 Agricultural Commodities' Market Price

1995,8.29/30 Agricultural commodities' market price in Ulaanbaatar

Market name	Bayansukh market	Dalai aage	Tarvan erdene	Tolun	Doruvon uul	Urlan	Tavan erdene	Songino hairhan	Harhorin	Denjinin 1000hunsni	AVERAGE PRICE
Owner-ship	private	private	private	private	private	private	rent	state	private	private	
Nummber of shops	130	118	168	85	164	68	63	14	515	120 (wholesale)	
Price(Tg)											
beef(kg)	750	850	600		800		680				740
mutton(kg)	780	800	650		650	700	750	650			710
pork(kg)			800								800
chicken(kg)		2,300			1,100	1,100					1,500
milk(500ml	130	140	100								120
flour-1st	190	230			220						210
flour-2nd	150	180		150							160
tomato	900	900	700	800	800	900					830
cucumber	400	450		450	450	450					440
potato	120	120	110		120	150	130	130			130
cabbege	100	130	90	130	120	150	140	120			120
carrot	150	180	100		250	250	200	160			180
turnip	80	80	120	80	130	100	90	100			100
onion	450	450	380	430		450	380	350			410
green onion					90						90
egg(piece)	70	70	55	70	60	70					70
sugar	360	380	350	400	400	400	380				380
vege.-oil	1,600	1,650	800	1,450	1,800	850					1,360

Market Price in the Study Area

		Bulgan		Ovorhangai		Selenge		Darhan-uul		Orhon		Ulaanbaatar	
		1995-4-20	1995-6-19	1995-4-20	1995-4-20	1995-4-20	1995-6-19	1995-4-20	1995-6-19	1995-4-20	1995-6-19	1995-4-20	1995-6-19
mutton	kg	350	530	450	560	400	750	500	750	450	580	480	500-700
beef	kg	380-400	500	370	500	450	750	500	800-850	400-600	650	460	600-750
horse meat	kg			220			500			380			500
goats meat	kg			260		350-450	450	410		400	480		
camels meat	kg			250				400					
sheeps skin	piece	22-2500	350	2500	800	2-2200	500	4500	800	2500		3500	16-1800
ox skin	piece	6-8000	500	5500		5-7000	2500	9000		4200	2000	9000	20-2500
horse skin	piece	2000		2500		20-2500				3300			
goat skin	piece	2500	200-800	3300		30-4500	3000	3800		4200		6400	10-2500
camels wool	kg			450					350				850
goats down	kg		8000	12000	11000	70-8500	8000	10000	10500	10000	8000	130-13500	110-12800
main sheep wool	kg			250		150-180		320	300	380		280	350
butter	kg	850	530		780	900		700-800	700-800	950	950	700	750
melted butter	kg												
cow milk	l	170	70	100	170	120-150	100	150-180	130	120	160	180-200	100-160
small animal milk	l												
fermented mares milk	l	250	250										
wheat	kg	30000	26-32000	30000	30000	35000	35000	22000	22000				
barley	kg	15000	22-25000	20000	20000								
fine flour	kg					114		120	125	130	160	145	145-150
1st-grade flour	kg	110	119	110	130	95	110	100	110	125	142	130	140-145
2nd-grade flour	kg	85-90	89	100	120	80	98	90	100	110	125	110	120
potato	kg	150	130	160	240	150	140	140	170	200	240	150-180	120-180
cabbage	kg					130		250		400			230
onion	kg	480	450	300	550	400	350	380	350	510	400	380	450
carrot	kg			250		250	450	800	850	450		400	
sweed	kg					180		140	850	500		350	
garlic	kg				650	700	500	800	830	900-1000	800	750	750
male sheep	head	10000	8000	10000	15000	12-15000	15000	15000	15-20000		16000		20-25000
female sheep	head	8000	65-8500	8000	11000	8-12000	12000	12000	12000		10000		15-20000
ram	head	9000	75-9000			25-30000							
horse	head	45000	35-45000	40000	50000	40000	80000	30000	40-45000				
camel	head			50000	45000								
ox	head	110000	8-110000	70000	49000	80000	150000	50000	5-60000				
cow	head	50000	4-50000	40000	47000	50000	120000	40000	6-70000				
goat weither	head	8000	7-8000	8000		4000	8000	8000	8000				
dee goat	head	5000	4-5000	5000		2500	6000						
grass	pocket	240		400	500	150	150	180	180	350	350	300-350	300-350
	kg	8	8.5	22	26	11	15	11	11	40	40	12-18	12-18

Source: MOFA

1995.5.23 news paper

	Darai eej	3 holoror	Denjinin 1000hunsni	Shal dergul
alive sheep	20000	18-25000		
cabbage	350	250-350	350-360	
potato	180-200	150-200	140-180	180-230
green onion	100	80	60-70	
carrot	1000	700	450-940	700
sweed	1000	950	950	
vegetable oil	870-950	840		
yogult	200	150-200	200	
milk	180	150-200	170-180	
tomato	950-1000	800-900	860-900	900-1000
cucumber	400-430	350	350-360	370
butter 500g	480-580	440-450	450-500	
dried milk	1500-1800		1800	2000
sugar	460-490	420-450	390-400	420-450
beef	720-750	600-700	650-800	700-710
mutton		650-800	680-750	
rice	390	380	380-390	370-380
fine flour	150	155	150	150
1st-flour		140	135	140
2nd-flour			115	
sausage	1700-1900	1500-1700	1500-1700	
garlic	50-80	30	40	35
beef intestin	450	400-450	330	
mutton intes.		250-350	200-250	
millet	280	260-270	230	260
egg	55	55-65	50-65	
MONGOLchicken	1000/kg	500-550		
butter	780	750-780		
pork		1000		
fail		1000	1000	

1995.6.22 news paper

	Halholin	Darai eej	Tanan erdene
potato	240	250	250
cabbage	400-450	500	400-420
onion	330	300	280
sweed	470-480	500	520
sugar	350	300-330	290-350
mutton	600	650	
beef	550	600	580
goats meat		450	
fine flour	120-125	120	130
1st flour	110-150	118	120
rice	350	360	340-350
JAPANflour	130	140	

1995.6.15 news paper
Market price in tugrug by the 1st May

products	Unit	Bulgan	Ovorhangai	Selenge	Tov	Darhan-Uul	U.B.	Orhon
Sheep wool	kg		250		242	320	320	260
Lamb wool	kg				160			
Camel wool	kg				696		400	
Goat cashm	kg	10000	12000	9000	10452	10000	11000	11000
Goat wool	kg				150			
Cattle she	kg		200		163			
Cattle hai	kg		250		108			
Horse hair	piece				2523		3000	
Caw hide	piece	6000		3000	6997	9000	9000	6000
Sheep skin	piece	2000	2000	1200	2581	4500	4200	1600
Goat skin	piece	1500	3000	3800	3800	3800		3750

Table 3.4.4.6 Estimation of Economic Price

	Unit	WHEAT	SUGAR	FLOUR	BEEF	MUTTON	WOOL
(1)World Market Price	US$/ton	(Import from	240	(Import from	2,800	(beef p. ×	(Export to
(2)Freight and Insurance	US$/ton	CHINA)	70	CHINA)	240	0.84)	CHINA)
(3)CIF Port entry in CHINA (FOB at China border)	US$/ton	190	310	260	3,040		3,770
(4)CHINA - Ullanbaatar (CHINA Border - U.B.)	US$/ton	30	110	30	1,580		
(5)CIF/FOB Ulaanbaatar							
- in US$	US$/ton	220	420	290	1,460	1,230	3,770
- in Tg(460Tg/US$)	Tg/ton	101,200	193,200	133,400	671,600	565,800	1,734,200
(6)Handling & trader's margin (20% of (5)price)	Tg/ton	20,240	38,640	26,680	134,320	113,160	346,840
(7)Wholesale price	Tg/kg	120	230	160	540	450	1,390
(8)Domestic transportation	Tg/kg	15			30	30	30
(9)Farm gate price	Tg/kg	85			380	310	1,010

Table 3.4.4.7 MAIN IMPORT COMMODITIES

Items		1993	unit CIF price	1994	unit CIF price
Cranes	number	296,653	US$	–	US$
(Import value at current prices,1000US$)		(1,475.4)	5	(2,159.1)	–
Excavators	number	118			
	(1000US$)	(2,738.7)	23,209	(11,459.8)	–
Tractors and self-propelled mechanisms	number	200		249	
	(1000US$)	(732.3)	3,662	(3,096.2)	12,435
Trucks	number	398		224	
	(1000US$)	(2,768.1)	6,955	(3,876.9)	17,308
Buses	number	94		43	
	(1000US$)	(1,470.2)	15,640	(814.2)	18,935
Cars	number	1,419		2,846	
	(1000US$)	(7,212.0)	5,082	(13,272.6)	4,664
Diesel oil	t	282,125		1,237,158	
	(1000US$)	(53,707.7)	190	(21,504.7)	17
Motor gasoline	t	174,509		130,177	
	(1000US$)	(28,420.5)	163	(20,737.0)	159
Heavy oil	t				
	(1000US$)	(–)	–	(–)	–
Lubricants	t	10,333		3,983	
	(1000US$)	(7,594.5)	735	(3,265.7)	820
Phosphatic fertilizer	t				
	(1000US$)	(–)	–	(–)	–
Nitrogenous fertilizer	t				
	(1000US$)	(–)	–	(–)	–
Cement	t				
	(1000US$)	(–)	–	(–)	–
Window glass	t				
	(1000US$)	(–)	–	(–)	–
Paper	t	231		724	
	(1000US$)	(169.8)	736	(266.6)	368
Cereals	t	4,436		274	
	(1000US$)	(1,016.1)	229	(61.6)	225
(Wheat)	t				
	(1000US$)	(–)	–	(–)	–
Vegetable oil	t	967		585	
	(1000US$)	(753.6)	780	(358.2)	612
Sugar	t	20,780		9,652	
	(1000US$)	(6,236.1)	300	(2,935.8)	304
Green tea	t	6,472		255	
	(1000US$)	(5,145.8)	795	(162.0)	635
Flour	t	92,012		12,421	
	(1000US$)	(20,417.2)	222	(2,462.4)	198
Fresh fruits	t	7,425		1,447	
	(1000US$)	(54,560.0)	7,348	(438.6)	303
Cotton fabrics	m				
	(1000US$)	(–)	–	(–)	–
Woollen fabrics	m	2,666,965		2,795	
	(1000US$)	(682.8)	0.26	(3.6)	1.29
Silk	m	1,052,657		12,299	
	(1000US$)	(175.6)	0.17	(29.7)	2.41
Others.					
	(1000US$)	(183,740.5)	–	(134,757.4)	–
Total					
	(1000US$)	(379,016.9)	–	(221,662.1)	–

SOURCE : Ministry of Trade and Industry

Table 3.4.4.8 MAIN EXPORT COMMODITIES

Items		1993	unit FOB price	1994	unit FOB price
Flour spar	t	79,511	US$	16,190	US$
	(1000US$)	(8,342.2)	105	(1,578.4)	97
Flour spar;Standard I-III	t	13,315			
	(1000US$)	(729.0)	55	(–)	–
Flour spar;Standard IV	t	77,163			
	(1000US$)	(8,857.7)	115	(–)	–
Flour spar;Non-standard	t	18,600		88,008	
	(1000US$)	(355.0)	19	(10,997.6)	125
Scored wool	t	2,638		752	
	(1000US$)	(3,650.3)	1,384	(878.3)	1,168
Two-toothed sheep & Lamb's wool	t	14,707		13,058	
	(1000US$)	(23,311.4)	1,585	(12,797.3)	980
Camel's wool	t	3,063		2,505	
	(1000US$)	(4,859.4)	1,586	(5,558.7)	2,219
Goat down	t	857		927	
	(1000US$)	(491.6)	574	(733.8)	792
Horse mare	t	236		211	
	(1000US$)	(366.6)	1,551	(319.7)	1,517
Horse hide	t	153,490		39,061	
	(1000US$)	(1,566.9)	10	(608.8)	16
Sheep skin	pieces	4,151,225		1,992,881	
	(1000US$)	(20,527.5)	5	(9,823.4)	5
Goat skin	pieces	681,944		494,675	
	(1000US$)	(2,790.0)	4	(2,000.0)	4
Glazed kid leather (goat)	sq.decimeters				
	(1000US$)	(–)	–	(–)	–
Shevret	sq.decimeters				
	(1000US$)	(–)	–	(–)	–
Leather clothes	pieces	66,526		17,314	
	(1000US$)	(5,025.6)	76	(1,284.3)	74
Carpet	sq.m				
	(1000US$)	(–)	–	(–)	–
Woolen fablics	m	7,624		2,883	
	(1000US$)	(288.9)	38	(89.7)	31
Woolen blankets	t	6,981		7,725	
	(1000US$)	(501.3)	72	(385.5)	50
Goat down goods	pieces	6,550		6,503	
	(1000US$)	(558.0)	85	(693.2)	107
Camel woollen goods	pieces	6,981		7,725	
	(1000US$)	(501.3)	72	(385.5)	50
Marmont skins	pieces	90,566		12,312	
	(1000US$)	(457.8)	5	(91.1)	7
Wheat	t	5,426		15,780	
	(1000US$)	(466.5)	86	(1,119.7)	71
Vodka	litres				
	(1000US$)	(–)	–	(–)	–
Meat	t	6,994		4,917	
	(1000US$)	(7,785.2)	1,113	(6,133.4)	1,247
Livestock	t	41,990			
	(1000US$)	(1,945.9)	46	(–)	–
Horses	heads				
	(1000US$)	(–)	–	(–)	–
Others.					
	(1000US$)	(289,775.3)		(268,756.1)	
Total					
	(1000US$)	(382,652.1)		(324,234.5)	

SOURCE : Ministry of Trade and Industry

Table 3.4.4.9 Main Export Commodities(2)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Copper, 1000t	342.4	345.9	345.5	346.0	350.6	347.5	243.5	346.0	394.5	448.6
Molybdenium, t	3,017.0	3,209.0	3,324.0	3,271.5	3,312.0	3,990.4	3,167.2	2,975.1	2,908.7	5,809.4
Fluor spar, 1000t	787.3	592.3	513.6	504.0	551.2	493.4	114.3	166.4	92.8	16.2
Fluorspar concentrate.t	-	41.0	71.0	115.3	113.0	116.6	120.8	85.5		
Cement, thous.t	-	132.5	216.8	156.5	175.0	95.4	-	-	13.6	2.3
Timber, thous.m3	58.7	39.0	39.4	19.8	31.4	19.9	-	0.0	12.0	36.1
Sawn wood, thos.m3	136.1	121.3	126.1	93.6	71.1	42.5	90.2	71.9	79.9	52.6
Scoured wool, thous.t	5.7	5.1	5.0	4.9	3.5	2.8	2.2	7.3	2.6	0.8
Two-toothed sheep's and lamb's wool, thous.t	2.0	2.0	2.1	1.9	1.4	0.5	-	-	0.0	0.0
Camel's wool, thous.t	2.6	2.7	2.2	2.4	2.1	1.9	0.1	1.7	3.1	2.6
Goat down, thous.t	0.6	0.4	0.4	0.5	0.2	0.4	0.6	1.7	1.4	0.6
Horse mane, thous.t	0.6	0.6	0.6	0.6	0.7	0.5	-	0.4	0.2	-
Horse skins, thous.t	58.0	81.3	60.2	132.0	124.7	105.2	78.5	13.5	153.5	45.4
Sheep skins, thous.pieces	280.2	278.4	275.0	253.5	289.0	130.0	131.0	1,633.6	4,151.2	2,567.4
Goat skins, thous.pieces	526.2	240.7	252.0	214.0	30.0	113.2	101.0	265.0	681.9	588.2
Glazed kid leather / Goat leather /, thos.pieces	236.6	301.1	314.0	307.1	180.0	172.0	-	-	501.7	-
Chevrette, thous.pieces	411.0	299.1	195.7	164.8	93.8	24.1	-	-	71.1	-
Leather clothes, thous.pieces	321.5	281.0	302.4	...	75.3	87.0	128.7	128.2	86.5	17.9
Skin goos, mln toglog */	44.4	50.4	52.6	62.7	58.6	51.6	3.0	8.4		
Carpets, mln sq m	1.5	1.5	1.7	1.7	1.9	1.7	0.1	0.4	0.5	0.1
Woolen fabrics, thous.m	34.6	45.0	45.2	45.0	37.2	-	-	-	3.6	-
Woolen blankets, thous.pieces	313.9	366.7	369.2	326.0	377.0	336.4	46.2	38.1	7.0	7.7
Goat down goods, thous.pieces	236.5	292.7	298.1	291.0	270.6	275.7	26.1	132.7	106.3	99.4
Camel woolen goods, thous.pieces	16.1	22.3	26.2	24.3	21.7	23.2	18.3	7.6	6.6	3.9
Marmot skins, thous.pieces	578.8	764.8	865.2	981.6	331.5	73.0	81.0	41.8	90.6	25.7
Wheat, thous.t	6.2	3.7	4.8	93.6	31.0	27.1	-	1.4	5.4	18.8
Vodka,thous.t	350.0	275.0	416.1	220.7	140.8	186.4	-	5.9	30.5	22.8
Meat, thous.t	36.8	43.9	38.5	29.0	30.5	24.3	21.8	11.0	7.1	5.4
Livestock, thous.t	24.7	30.0	31.3	21.6	21.6	20.8	20.1	0.3	42000head	-
Horses, thous.t	63.1	64.0	64.0	64.0	64.0	42.3	23.2	-	-	-
Intestine, thous.rolls	2,858.6	3,080.9	3,298.8	2,981.7	2,953.4	2,163.8	495.6	3,523.8	1,361.8	1,103.6

Note : */ from 1990 mln.US$

Source : Mongolian Economy and Scociety in 1994, Statistical Office of MONGLIA, 1995

Table 3.4.4.10 Export by Countries / at current prices, mln US$/

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Total	689.1	716.1	717.9	739.1	721.5	660.7	348.0	388.4	382.6	367.5
Austria	0.3	0.1	0.1	0.1	1.8		0.1	0.3	0.5	0.1
USA	0.1	0.1	0.1	1.5	0.1	0.9	0.3	4.4	4.3	12.4
United Kingdom	2.8	2.8	3.9	1.6	4.9	3.0	1.9	3.8	1.2	5.1
Afganistan						1.5	3.2	0.7	0.7	0.0
Bulgaria	13.1	16.7	15.4	14.6	21.6	16.7	1.5	7.3	0.1	-
USSR */	530.7	563.3	559.7	558.7	528.4	517.5	235.2	219.7	201.4	103.8
Italy	0.9	0.1	0.3	0.1	1.8	5.5	4.7	8.8	10.5	8.7
Netherland	6.9	3.7	4.6	3.0	5.8	1.5	0.5	1.7	1.3	3.1
Poland	19.0	14.0	15.0	18.7	14.3	11.2	0.2	0.4	0.0	0.0
Romania	15.8	13.0	13.4	18.5	14.9	10.1	0.1	0.01	0.1	-
North Korea	5.5	12.7	7.9	5.8	6.0	7.8	1.1	1.2	0.8	0.2
Singapore							0.1	0.6	0.3	0.0
Hongkong							3.9	3.8	1.4	2.4
Hungary	14.8	13.4	12.8	13.9	17.9	13.7	9.2	3.0	0.1	0.0
France	0.3	0.4	0.3	0.4	0.1	2.7	1.1	0.8	1.7	0.2
China	2.7	3.3	3.7	3.1	4.2	11.3	52.8	69.4	120.2	73.2
Germany	24.3	24.6	24.5	22.5	22.5	13.7	10.2	12.1	3.0	2.4
Czekhslovakia	31.5	27.2	29.3	30.6	29.6	29.9	4.3	4.2	0.4	0.5
Switzerland	6.6	8.4	8.4	8.4	7.9	1.8	1.0	16.4	10.4	22.4
Yugoslavia	3.3	2.1	3.6	10.0	9.7	2.8	1.9	1.8	0.1	0.0
Japan	7.6	6.3	8.4	21.9	24.5	7.6	11.7	18.7	17.1	45.0

Note : */ from 1991 Commonwealth of Independent State

Source : Mongolian Economy and Scociety in 1994, Statistical Office of MONGLIA, 1995

Table 3.4.4.11 Outline of Main Food Company in the Study Area

No.	Company	Foods	Unit	Production Capacuty ①	Production Volume 1993 (Actual)	1994 (Prospect)	1994② (Actual)	②/①	Storage Capacity (ton)	Employees (1993)
1	Bulgan "Shim"	Confectionery	ton	1,300	30.6	40.0	103.7	8%	5 - 10	25
		Arhi	1000L	150	117.6	85.0	93.1	62%		
		Juice	1000L	100	53.3	80.0	130.7	131%		
	"Tengis"	Bread	ton	300	230.8	80.7	106.6	36%	1 - 2	10
	"Olz"	Confectionery	ton	200	34.8	104.0	83.7	42%	1 - 2	32
		Arhi	1000L	100	13.7	61.2	93.7	94%		
		Juice	1000L	100	0.4	30.4	na			
		Candy	ton		3.0	172.0	-			
2	Ovorhangai (Arbaiheer)	Bread	ton	1,980	671.7	315.0	357.6	18%	15- 20	167
		Confectionery	ton	660	337.5	352.0	278.0	42%		
		Arhi	1000L	300	125.5	180.0	74.9	25%		
		Juice	1000L	200	73.8	80.0	53.4	27%		
		Candy	ton	50	35.1	30.0	35.8	72%		
		Milk	1000L	1,500	354.7	200.0	62.7	4%		
3	Ovorhangai (Harhorin)	Bread	ton	900	175.0	93.0	66.2	7%	5 - 10	90
		Confectionery	ton	400	66.0	75.0	60.5	15%		
		Arhi	1000L	150	60.2	53.0	46.0	31%		
		Juice	1000L	150	5.7	25.0	18.0	12%		
		Candy	ton	30	12.1	11.0	15.0	50%		
		Alcohol	1000L	350	130.6	120.0	53.0	15%		
4	Tov	Bread	ton	1,300	574.4	600.0	172.2	13%	5 - 10	98
		Confectionery	ton	440	199.8	150.0	44.7	10%		
		Arhi	1000L	300	60.0	60.0	9.4	3%		
5	Selenge "Shim"	Bread	ton	900	489.6	156.0	352.8	39%	5 - 10	68
		Confectionery	ton	550	68.9	-	47.9	9%		
		Arhi	1000L	100	42.3	38.0	21.0	21%		
		Juice	1000L	100	100.1	92.0	78.3	78%		
6	Selenge (Zuunharaa) "Alchol & Gluten"	Bread	ton	1,000	802.4	420.0	430.0	43%	40- 60	720
		Confectionery	ton	300	96.4	60.0	52.5	18%		
		Arhi	1000L	150	-	70.0	96.6	64%		
		Juice	1000L	150	136.0	120.0	88.2	59%		
		Noodles	ton	1,000	20.2	40.0	24.7	2%		
		Alcohol	1000L	3,000	2,109.4	1,983.0	1,796.3	60%		
7	Orhon (Erdenet)	Bread	ton	4,500	2,500.0	3,000.0	928.1	21%	50- 60	310
		Confectionery	ton	1,500	500.0	650.0	206.8	14%		
		Milk	1000L	3,000	2,000.0	1,500.0	56.5	2%		
		Arhi	1000L	400	282.3	300.0	86.4	22%		
		Juice	1000L	1,000	-	800.0	37.7	4%		
		Beer	1000L	3,000	337.3	300.0	106.8	4%		
8	U.B."Atar"	Bread	ton	16,500	13,361.5	11,178.0	11,580.6	70%	90-100	316
9	Ulaanbaatar "Alhi,Beer & Juice"	Arhi	1000L	2,600	3,025.0	2,858.0	2,271.8	87%	80-100	503
		Juice	1000L	7,300	5,467.2	5,543.0	3,832.7	53%		
		Beer	1000L	7,000	2,287.2	1,578.0	688.8	10%		
10	Ulaanbaatar "Bread & Candy"	Bread	ton	30,228	15,040.4	13,580.0	12,043.8	40%	120-150	731
		Confectionery	ton	6,550	1,815.6	1,896.6	1,720.8	26%		
		Candy	ton	5,000	1,778.0	1,884.0	1,447.6	29%		
		Noodles	ton	3,000	759.7	534.2	543.0	18%		
		Juice	1000L	150	-	14.0	-			
11	Ulaanbaatar "Milk for Children"	Milk	1000L	12,000	1,081.0	941.0	1,000.0	8%	40- 50	40
12	Ulaanbaatar "Ogoonor" "Ogooj"	Bread	ton	1,300	600.0	600.0	600.0	46%	20- 30	388
		Confectionery	ton	6,000	5,600.0	5,600.0	2,506.9	42%		
		Noodles	ton	1,820	650.0	650.0	662.0	36%		
		Candy	ton	500	175.0	465.0	400.2	80%		
		Milk	1000L	500	216.0	216.0	150.0	30%		
13	Ulaanbaatar "Milk"	Milk	1000L	60,000	7,500.0	12,000.0	2,700.8	5%	100-150	375
14	Ulaanbaatar "Deej"	Confectionery	ton	600	417.0	430.0	200.0	33%	2 - 3	30
15	Ulaanbaatar "Food Prod. & Trade centre"	Confectionery	ton	50	7.0	14.0	120.0	240%	0.5-1.0	28
16	Darkhan	Bread	ton	6,200	2,794.0	900.2	832.5	13%	100-120	280
		Candy	ton	5,000	644.7	55.0	1,447.6	29%		
		Milk	1000L	5,000	300.5	782.2	796.4	16%		
		Juice	1000L	300	5.6	313.0	10.0	3%		
Total		Bread	ton	65,100	37,009.0	30,862.9	27,458.4	42%	680-890	4,211
		Confectionery	ton	18,550	9,173.6	9,371.6	4,825.5	26%		
		Candy	ton	10,580	2,648.3	2,617.0	3,346.2	32%		
		Noodles	ton	5,820	1,429.9	1,224.2	1,229.7	21%		
		Arhi	1000L	4,250	3,726.6	3,705.2	2,792.3	66%		
		Beer	1000L	10,000	2,624.5	1,878.0	795.6	8%		
		Juice	1000L	9,400	5,842.1	7,097.4	4,249.0	45%		
		Alcohol	1000L	3,350	2,240.0	2,103.0	1,849.3	55%		
		Milk	1000L	82,000	11,451.6	14,857.0	4,765.0	6%		

Source : MOFA

Table 3.4.4.12 Outline of Vegetable Storage Companies in Ulaanbaatar

No.	Name of Company	Vegetables	Number of Storage House	Storage Capacity (ton)	Annual Storage Volume (ton)					Employees
					1991	1992	1993	1994	1995 (prospect)	
1		Potato	3	350		547.2	346.6	372.1	400.0	
		Cabbage	17	4,000		825.2	1,165.0	45.0	200.0	
		Turnip	1	300		73.6	141.7	8.5	30.0	
		Carrot	1	120		28.6	41.0		10.0	
		Onion	2	600		260.0			10.0	
		Total	24	5,370		1,734.6	1,694.3	425.6	650.0	35
2		Potato	12	4,600		3,439.0	1,386.9	398.8	400.0	
		Cabbage	1	300		83.7	226.4	89.7	90.0	
		Turnip	1	450		257.8	144.2	133.2	120.0	
		Carrot	1	250		200.6	172.2	113.3	50.0	
		Onion	4	240		193.9				
		Total	19	5,840		4,175.0	1,929.7	735.0	660.0	20
3		Potato	4	350		696.4	577.3	703.1	800.0	
		Cabbage	2	250		390.7	446.4	278.3	500.0	
		Turnip	2	300		254.5	235.6	188.0	250.0	
		Carrot	5	350		222.8	305.3	170.9	200.0	
		Onion	8	400		427.0	20.5	12.3	60.0	
		Total	21	1,650		1,991.4	1,585.1	1,352.6	1,810.0	26
4		Potato	6	4,500		3,070.3	991.8	1,100.0	1,250.0	
		Cabbage	2	400		145.0	172.2	267.0	250.0	
		Turnip	1	300		334.0	341.7	59.1	70.0	
		Carrot	1	100		82.0	56.5	16.0	30.0	
		Onion	3	500		586.4	24.0		10.0	
		Total	13	5,800		4,217.7	1,586.2	1,442.1	1,610.0	72
5		Potato	4	12,000		5,586.0	2,183.8	1,160.2	2,500.0	
		Cabbage					129.8	80.0	200.0	
		Turnip					123.0	31.4	100.0	
		Carrot								
		Onion								
		Total	4	12,000		5,586.0	2,436.6	1,271.6	2,800.0	25
6		Potato	4	1,400		1,074.8	381.2	346.3	450.0	
		Cabbage	1	100		100.2	50.6	90.8	80.0	
		Turnip	1	100		78.1	40.2	18.9	20.0	
		Carrot	1	50		27.9	13.8	9.8	10.0	
		Onion	2	160		167.7	3.1	11.2	13.0	
		Total	9	1,810		1,448.7	488.9	477.0	573.0	20
Total		Potato	33	23,200	19,344.9	14,413.7	5,867.6	4,080.5	5,800.0	
		Cabbage	23	5,050	3,681.6	1,544.8	2,190.4	850.8	1,320.0	
		Turnip	6	1,450	609.8	998.0	1,026.4	439.1	590.0	
		Carrot	9	870	511.2	561.9	588.8	310.0	300.0	
		Onion	19	1,900	1,467.7	1,635.0	47.6	23.5	93.0	
		Total	90	32,470	25,615.2	19,153.4	9,720.8	5,703.9	8,103.0	198

Source : MOFA, Ulaanbaatar city

Table－3.4.4.13 Meat Storage Plants in the Study Area

(Unit: t ,people)

Aimag	Numbers	Total capacity	Storage Volume			Number of employee
			1991	1992	1993	
Ulaanbaatar	12	8,000	6,700	6,700	6,000	70
Tov	1	300	300	300	200	6
Bulgan	1	360	360	300	300	6
Ovorhangai	2	3,000	3,000	2,500	2,500	30
Erdenet	2	3,000	3,000	1,200	1,200	25
Total	18	14,660	12,760	11,760	10,200	137

Note: Selenge aimag and Darkhan city have no plant and procure meat from the Darkhan meat palnts directly

Source: MOFA

Table-3.4.4.14 Milk Production of main plants

(1) Ulaanbaatar milk plant

Item	Unit	1990	1991	1992	1993	1994	1995	1996(plan)
Row milk	t	38,082.4	30,729.0	16,716.8	9,741.8	2,415.0	2,275.0	2,300.0
Fresh milk	t	29,353.7	21,030.1	11,897.1	3,076.2	417.0	446.5	956.9
Cream	t	103.8	78.5	72.4	77.6	12.7	31.0	32.0
Cheese	t	1.4	0.9	0.7	0.2			
Yogurt	t	1,637.3	817.1	454.6	201.6	48.1	105.0	106.0
Butter	t	688.6	367.4	146.7	25.4	22.0	16.3	18.0
Icecream	t	1386.0	972.4	636.4	423.7	295.4	431.0	435.2
Aaluz(Curt)	t	665.0	509.5	328.3	251.6	49.8	22.6	24.0
Aalulu(Dried curt)	t	38.6	34.1	27.6	16.9	15.1	8.0	9.0
Pouder Milk	t					60.7	74.0	75.5

(2) Darkhan milk plant

Item	Unit	1991	1992	1993	1994	1995	1996(plan)
Row milk	t	2,113.0	1,744.0	764.7	796.0		
Fresh milk	t	1,882.6	1,047.1	309.7	182.2	240.0	300.0
Yogurt	t	268.0	188.9	25.9	0.4	14.5	30.0
Butter	t	154.2	40.9	22.8			
Icecream	t	154.2	58.9	6.7	60.7	55.0	60.0
Aaluz(Curt)	t	134.8	87.9	24.0	31.8	15.3	40.0
Aalulu(Dried curt)	t	2.5	0.2	0.7			

Source: MOFA

Fig. 3.4.4.1 EXPORT-IMPORT (MT)
FLOUR

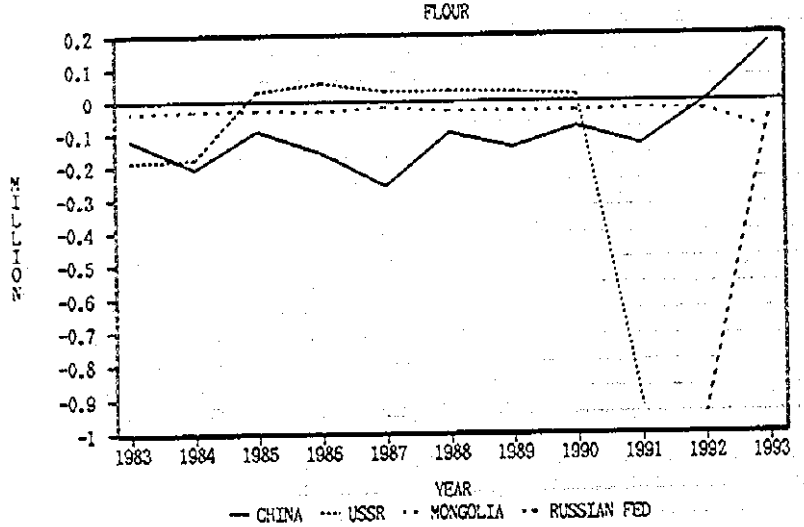


Fig. 3.4.4.2 EXPORT-IMPORT (MT)
WHEAT+FLOUR (W.EQUIV.)

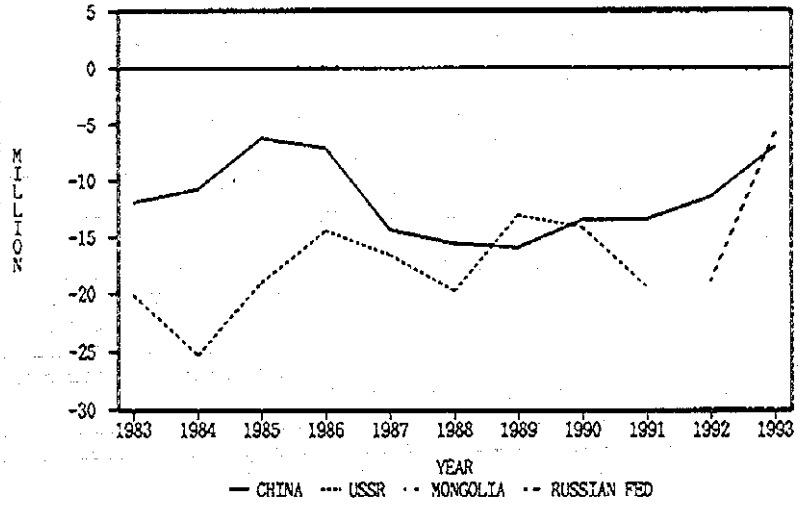


Fig. 3.4.4.3 EXPORT-IMPORT (MT)
MEAT (FRESH+CH+FROZEN)

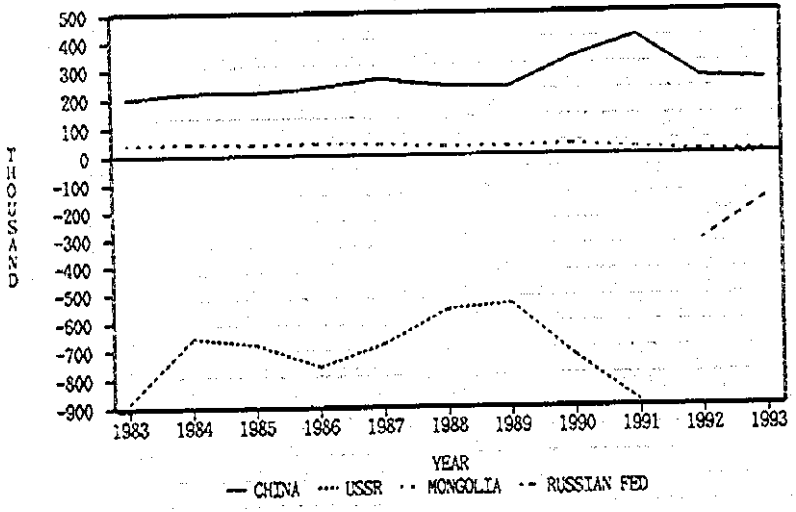
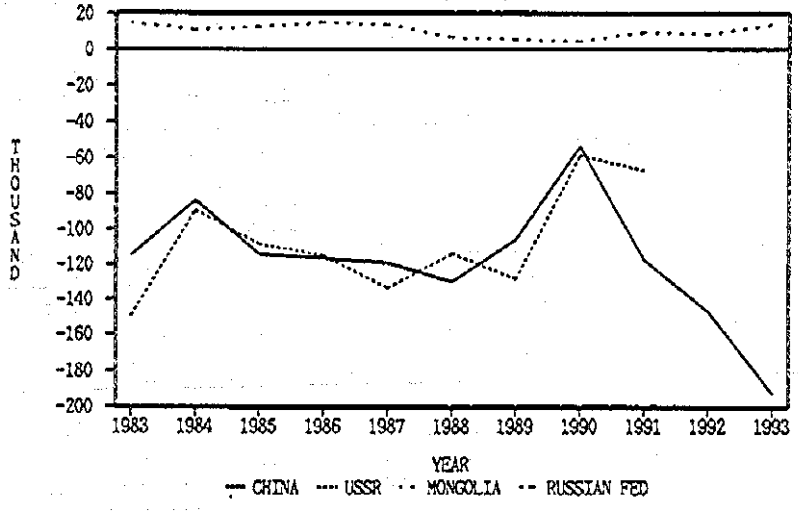
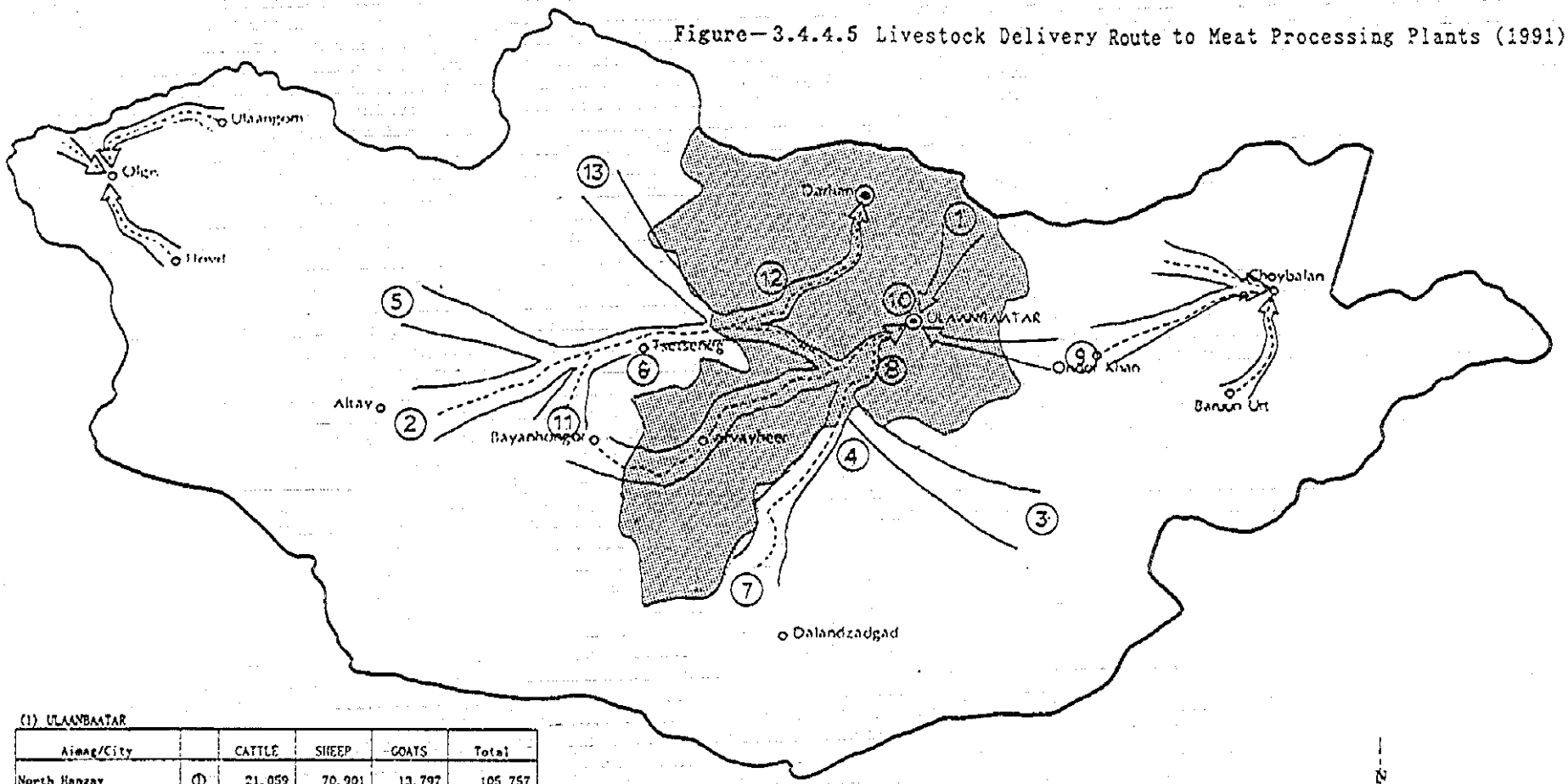


Fig. 3.4.4.4 EXPORT-IMPORT (MT)
WOOL (GREASY)



Figure—3.4.4.5 Livestock Delivery Route to Meat Processing Plants (1991)



(1) ULAANBAATAR

Aimag/City		CATTLE	SHEEP	GOATS	Total
North Hangay	①	21,059	70,901	13,797	105,757
Govi Altai	②	7,217	90,494	53,119	150,830
East Govi	③	2,365	44,057	5,921	52,343
Mid Govi	④	6,839	99,195	43,759	149,793
Dzavhan	⑤	13,272	151,995	28,965	194,192
South Hangay	⑥	13,076	130,309	33,014	176,399
South Govi	⑦	725	20,864	44,212	65,801
Central	⑧	11,253	106,288	10,443	127,984
Henty	⑨	3,951	51,311	11,148	66,410
Ulaanbaatar	⑩	182			182
UB Total		79,939	765,374	244,378	1,089,691

(2) DARKHAN

Aimag/City		CATTLE	SHEEP	GOATS	Total
Bayanhongor	⑪	5,643	68,031	47,999	121,673
Bulgan	⑫	11,124	38,230	7,468	56,822
Hovsgol	⑬	14,576	38,230	18,654	71,460
Selenge		1,741			1,741
Darkhan					
Darkhan Total		33,084	144,491	74,121	251,696

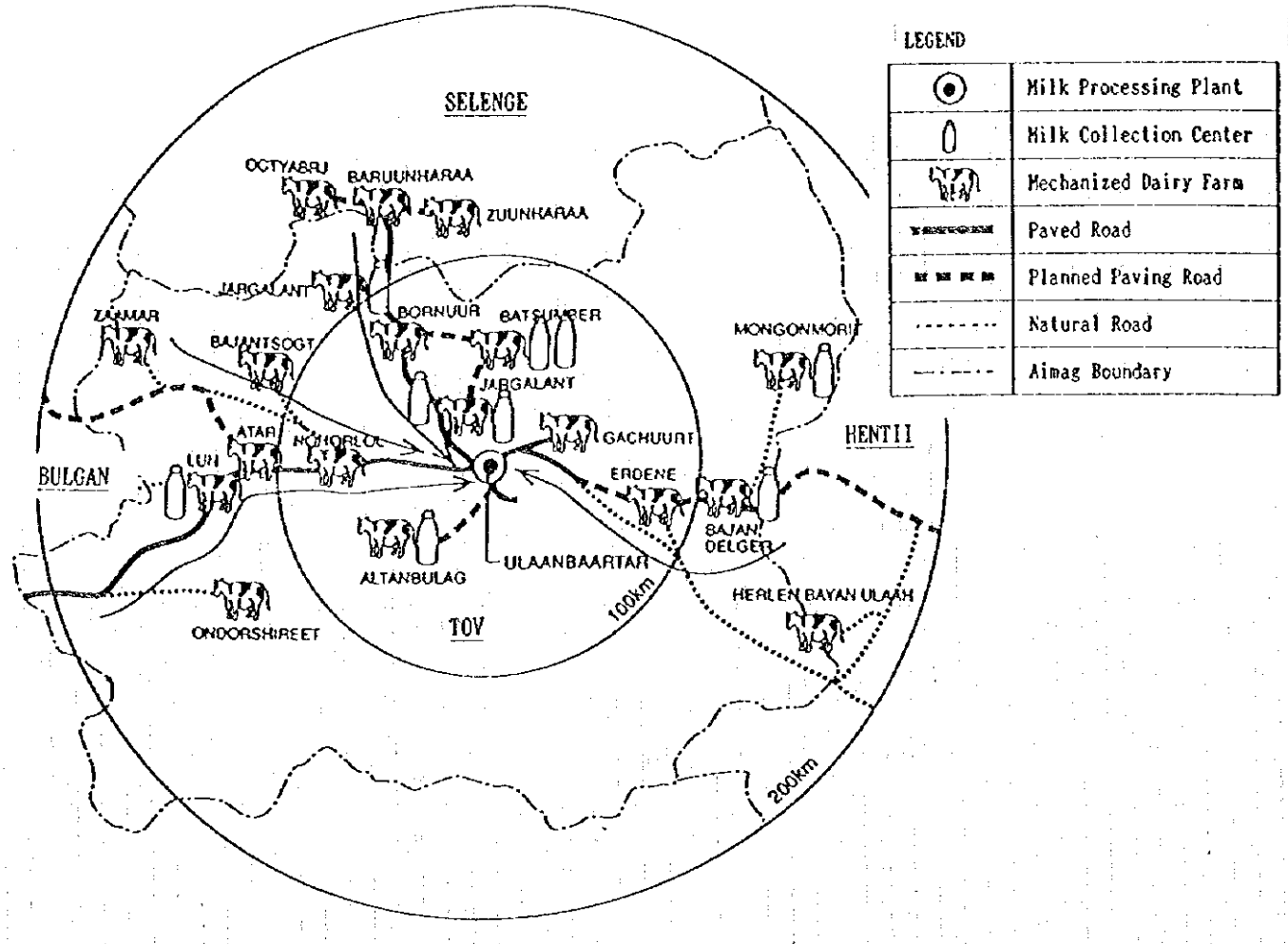
International boundary

Livestock trekking route

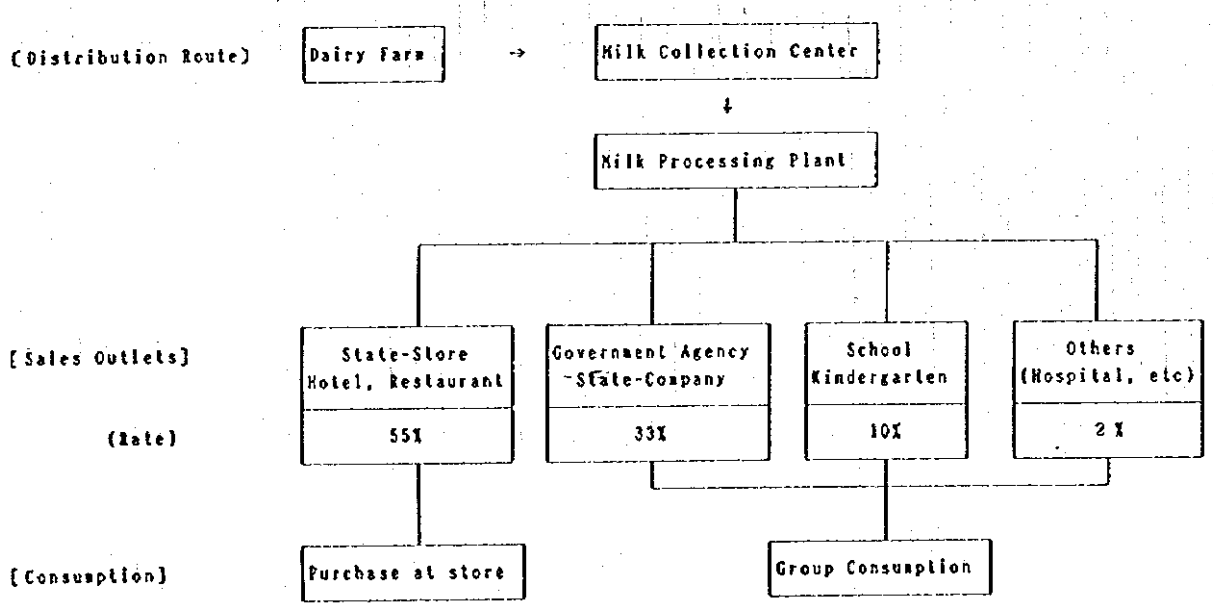
0 100 200 km

Figure-3.4.4.6 Milk Collection Range and Delivery Route of Ulaanbaatar Milk Plants

(1) Milk Collection Range (~1993)

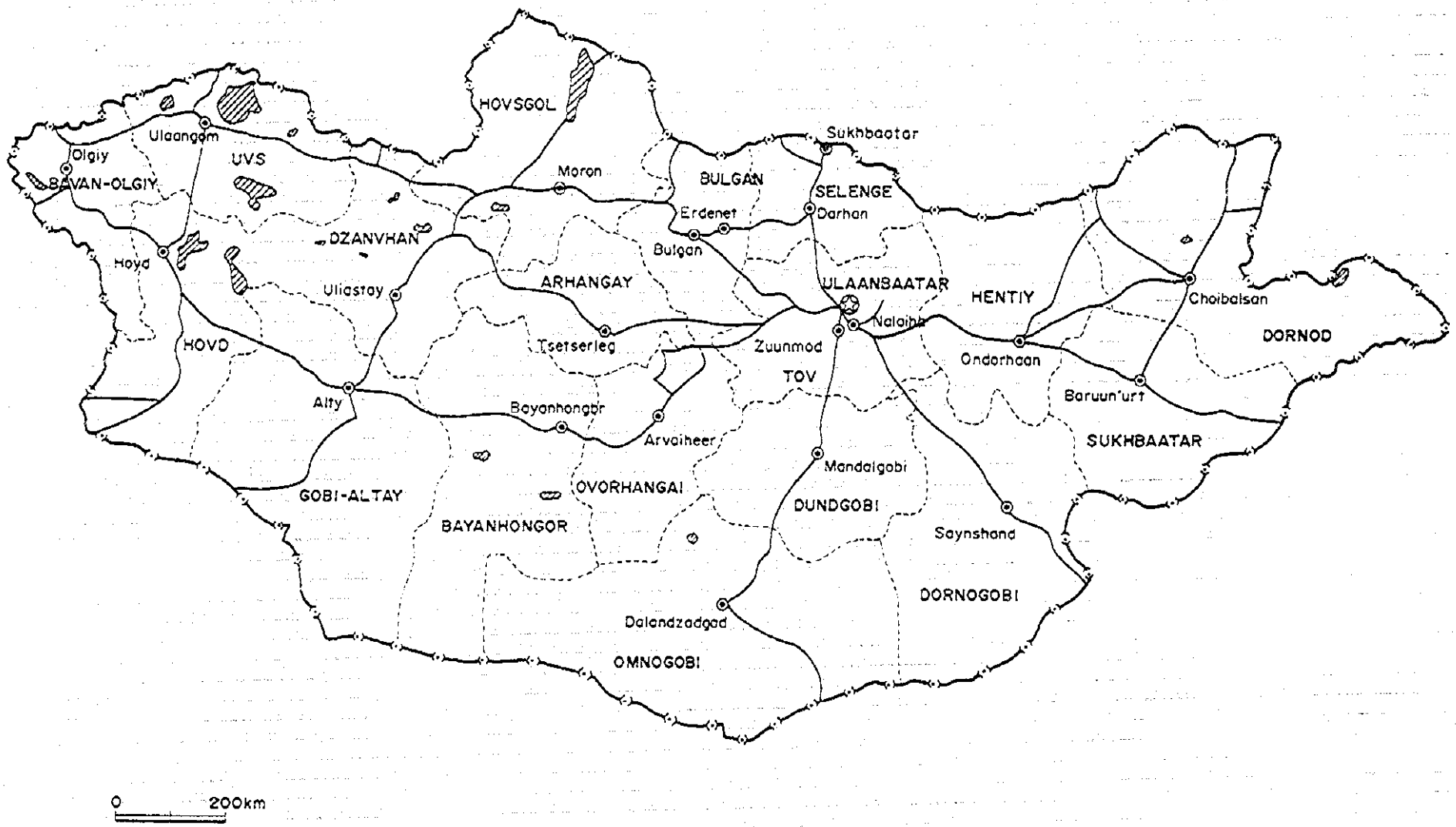


(2) Delivery Route and Sales Outlets



Source: JICA Report 「Basic Plan Study on Rehabilitation of Ulaanbaatar Milk Plant」

Figure 3.6.1 Road Network in Mongolia



CHAPTER 4 DEVELOPMENT PLAN

4．1．1．1 Analysis of Development Potential

1 Analysis of Domestic Market

1) Economic Conditions around the Recent Agricultural Market

(1) General conditions

Mongolia, which has lost the assistance it used to receive from the former Soviet Union and Eastern European countries, began to shift to a market economy from 1990. Thereafter, it privatized state farms and NAGDELs which had been the mainstays of its agricultural and livestock production, and its various agricultural and livestock processing companies, and it has worked to maintain agricultural and livestock production, which are the industries supporting the Mongolian economy, and secure food for its people. However, agricultural production retreated greatly due to the chaos that resulted from the abrupt and radical shift to a market economy. Large-scale grain farms, which depend on irrigation facilities, and facility dependent livestock farms, such as dairy farms, were especially hard hit. The recent circumstances concerning agricultural and livestock production are as follows.

① Since there is heavy dependency on imports for machinery, fuel, and other materials, reduced exchange rates caused import prices to escalate (Table 2.2.1).

② Transport costs have risen due to the introduction of self-supporting programs and business accountability, and production and distribution have been adversely affected, especially in remote rural areas with poor road conditions.

③ High interest rates during this age of inflation have become a heavy burden.

This lowering of exchange rates, increase in the cost of shipping, high interest rates stimulated by increasing inflation, and other factors have all worked together to create a situation where retail prices can no longer keep up with and cover increases in the cost of production which have resulted from this combination of factors, and this has caused many of the agricultural and food companies which have been created as a result of privatization to reach a point where they are bordering upon collapse.

From the perspective of the consumer as well, increases in income have failed to keep pace with rises in prices, and this has created a situation where Mongolian citizens are forced to spend virtually all of their income on food, thus making it difficult to look for any hope of production being restored to its previous levels through increased purchasing power on the part of consumers.

The daily lives of the people are relatively peaceful and orderly in spite of this critical situation, because Mongolia has some livestock production supported by traditional nomadic herders. Many urban

inhabitants have nomadic relatives, and their relationships are extremely open with anyone being free to start a nomadic lifestyle. Therefore, after private ownership of livestock was permitted, the production of livestock products by nomads did not experienced the type of drastic production reduction seen in agriculture, and the increased meat supply is making up for the insufficient food supply caused by reduced agricultural production. However, the volume of the national per capita supply of meat has been declining since 1992 (Table 3.3.2.1); therefore, there are concerns that the meat supply also will decline due to reduced numbers of livestock, especially female breeding stock.

(2) Inflationary trends

Table 3.4.4.3 shows changes in producer price levels for agricultural and livestock products. A look at the rate of increase in producer price levels over the ten year period beginning from the era of economic planning in 1985 and reaching into the year 1994 after the introduction of economic reforms shows that, using a unit prices of 1.0 to represent 1985 price levels, prices have risen dramatically over the 1985 levels: meat 89.3, milk 44.0, eggs 10.6, raw wool 27.2, cashmere 86.3, raw leather 46.1, wheat 55.5, potatoes 42.3, vegetables 45.0, and animal feed 74.3. A look at these figures shows that, with the exception of eggs, producer prices for all of these goods have increased from 40 to 90 times over their original levels of ten years ago. If one takes the averages of the producers prices shown in this table, one sees that prices of livestock products have risen to 70.3 times and those of agricultural products to 54.7 times over their 1985 levels, thus showing that the rate of inflation in livestock products has been particularly high. If one also averages the rate of inflation in producers prices over the past two years for both agricultural and livestock products, one sees that although the apparent rate of inflation has remained at somewhere around 1100 percent, when viewed against the background of an overall general rate of inflation of 2,600 percent over the period from June of 1992 to May of 1994, producers prices for agricultural and livestock products have in reality been declining.

Table 3.4.4.4 - 3.4.4.5 shows recent changes in retail prices in the food commodities market, and a look at the figures for inflation over the oneyear period from 1993 to 1994 shows that using a unit prices of 1.0 to represent 1985 price levels, prices have risen as follows: meat 3.3, milk 2.5, eggs 3.1, potatoes 2.2, vegetables 1.9, and flour 1.8. The average price increase for all the foods shown in this table comes to 2.2 times 1985 levels, thus indicating that increases in the prices of livestock products have outpaced those in the prices of agricultural products.

2) Market of agricultural products

Economic confusion triggered by the transition to a market economy, as described in Chapter 4, has cut production of agricultural produce. Table 3.4.4.1 shows changes of the production index for grains, wheat, potatoes and vegetables when adopting 1989 as 100. The production index for each produce in 1993 was 57 for grains, 66 for wheat, 39 for potatoes and 38 for vegetables, showing a siginificant decrease in all products. Nevertheless, the diets of residents of large cities and prefectural Aimag centers and younger people thirty years old or younger are changing from the traditional dietary pattern based on meat and diary products, to an urban dietary pattern, which includes bread, potatoes, and vegetables. Therefore, demand for agricultural products can be expected to grow beyond the per capita annual consumption volume of 1989, when a record-breaking food supply was achieved, because of factors such as that the population of people with urban dietary patterns is expected to continue increasing hereafter and the supply of meat, which had been consumed in place of grains, is in a downward trend.

Recent outlooks show that prices are levelling off, the currency exchange rate is stabilizing and banks are reducing lending rates. Thus, demand will probably recover relatively easily when agricultural prodution begins to rises .

3) Market of livestock products

Privatization of livestock, which advanced after the transition to a market economy, has been achieved. However, although affected by changing economic conditions, livestock production did not decrease to a great extent, because this industry was not affected as much by inflation and required less borrowing of funds, since its early investments in machinery, facilities, and other equipment and investments for production materials, such as feed and fuel, were small compared with the agriculture sector. Adopting levels for 1989 as 100, production indexes in 1993 were 90 for meat, 92 for milk and 107 for wool (Table 3.4.4.1). Furthermore, this industry seem to be more stable since exchange prices for livestock produce advanced at a better rate than agricultural products(Table 5.3.1.3). Since meat and dairy products are traditional staples of Mongolians, their consumption volumes are relatively stable, in spite of the downward consumption trends. Therefore, production that accommodates population increases must be secured. In addition, since meat has been exported to the former Soviet Union from before the transition to a market economy, meat exports to the Russian Federation, where meat shortages are foreseen, are expected to continue in the future.

Intensive livestock industries, such as dairy, hog, and poultry farming, which were expected to be major food supply sources for the residents of large cities, require large amounts of funds for facility

construction, feed procurement, and other expenses when compared with the normadic farming. Consequently, these intensive livestock industries were unable to cope with changes in the economic environment and their production volumes declined greatly. Adopting levels for 1989 as 100, production indexes for 1993 were 21 for milk and dairy products, 13 for pork and 28 for eggs.

Nonetheless, there is a large demand for these foods in large cities, such as Ulaanbaatar, where a fourth of Mongolia's population is concentrated. Heretofore, livestock product supplies for large cities were provided mainly by livestock processing plants located in these cities. However, since production at these plants has declined due to the chaotic circumstances of the transition to a market economy, some of the supply is now provided through distribution via livestock product exchanges and food product markets. Nevertheless, supply shortages still continue. Since the demand for animal protein food products is high due to the national character of a strong preference for meat and dairy products, it will be necessary to fulfill this demand by prompting intensive livestock industries, which will be able to produce food without depending on grassland resources, in grassland scarce large city regions.

4) Market for processed agriculture and livestock products along with exports

Looking at past production records for processed agriculture and livestock products, production indexes for 1993 when adopting levels in 1989 as 100, were 70 for wheat, 36 for mixed feed, 69 for bread, 21 for sausages, 16 for wool, 47 for carpets and 26 for leather products (Table 3.4.4.2). These figures reflect the production volumes of primary raw material. Levels for processed wheat products match the drop in production volume, and production and demand are expected to increase from the production recovery of wheat. Demand for mixed animal feed will probably ride following the recovery of livestock production using many facilities such as dairy and poultry.

Production of processed livestock products is falling even though the number of stock is relatively stable. The reason for this is that, because the responsibility for procuring raw materials has shifted from the national government to the processing plants since the transition to the market economy, it has become difficult for processing plants to procure raw materials, as they do not have their own systems for procuring raw materials and are short of procurement funds. A large amount of raw material flow out of the country at regions near the borderline, and indexes for exports in 1993 when adopting levels for 1989 as 100, were 1,436 for sheepskin (this sharply rose after 1992 when the level was 565), 2,273 for goatskin (Exports were especially low in 1989. Adopting levels in 1988 as 100, the export volume for 1993 becomes

319), 148 for camel wool, and 700 for goat cashmere (Adopting levels in 1988 as 100, the export volume for 1993 was 280. Export of goat cashmere was banned in 1994). This shows a large increase in the export volume of primary raw materials. Looking at export indexes for secondary products, export volumes in 1993 when adopting levels for 1989 as 100, were 39 for goat cashmere products, 30 for camel wool products and 10 for wool products, all showing a significant drop of volume.

Since primary raw materials of high value as resources are being exported, there is a high possibility that exports of secondary products will increase if raw material can be secured and processing techniques can be upgraded (Table 3.4.4.9). Therefore, if a distribution system to secure raw materials can be created and processing technology upgraded hereafter, there is a good possibility that exports of processed goods with higher added value can be increased.

Table 3.4.4.10 shows the trend of export amounts by importing country. Lately, the diversification of countries to which Mongolia exports has advanced, and it is promoting trade with many countries, as opposed to the old pattern of exporting mainly to the former Soviet Union. Therefore, opportunities to acquire foreign currency by exporting processed livestock products should continue to increase in the future.

2 Forecasts on Food Demand

Based on a proposal at the World Nutrition Conference held in Rome in Dec., 1992, the Mongolian Ministry of Food and Agriculture produced a National Program on the Population's Food Supply Improvement. Using this program as reference, food demand and agriculture / livestock production volumes for Mongolia and the Study area can be predicted by the following procedures.

1) Population changes in the target year

Table 3.3.1.1 and Figure 3.3.1.1 show the results of predicting the populations of the three major cities of Ulaanbaatar, Darkhan and Erdenet, centre and rural area of Aimags in the central region, Aimags outside the central region and the entire nation. The forecast is that the national population will reach three million in 2010. This is an increase of 750,000 over the population as of 1993. Furthermore, the population of the study area is expected to increase to approximately 1.5 million, 360,000 more people than in 1993, which means that 50% of the nation's population is expected to reside in the region.

2) National nutrition standards and food supply targets

Table 3.3.2.1 shows changes in the annual supply volume of individual foods per capita during the period between the latter half of the 80s, which recorded the highest agricultural production rate, to the former half of the 90s. Comparing these figures with the public health nutritional norms produced by the Ministry of Health in 1983 (Table 3.3.2.2), the national average calorie supply reached the norm of 83% in 1989. The PFC calorie ratio which measures the supply balance of protein (P), fat (F) and carbohydrates(C) also shows that food supply in 1989 was providing a relatively balanced diet. However, changes of economic conditions during the shift to market economy greatly affected national food supply. Calorie supply in 1993 dropped to 63% of the norm's level. Looking at the PFC ratio, although P and F supply reached 80% of the norm's level, C only reached 50%, signifying that carbohydrate sources such as grains and potatoes need to be supplied in larger volumes in order to achieve a balanced diet (Figure 3.3.2.1).

The food supply target for 2010 has been estimated based on the previously noted National Nutritional Standard. The per capita food supply volumes for each prefecture (Table 3.3.2.4 - 3.3.2.5) has been determined by multiplying the National Nutritional Standard for each region (Table 3.3.2.2) by the corrections for age groups (Table 3.3.2.3). The target for the national average caloric supply volume is 2,966 calories per capita, a 1,000 kcal increase over 1993, and a 300 kcal increase over 1989, prior to the transition to the market economy. This would mean a supply volume of approximately 3,200 kcal per adult, which would satisfy the supply target of 3,140 kcal.

3) Forcast on food demand

Table 5.3.2.5 shows the calculated volumes of food demand for Ulaanbaatar, rural and urban areas of the study area, prefectures not included in the study area, and nationwide which have been obtained by multiplying the respective populations by the per capita supply volume. The following table shows a comparison of national demand volumes by stable foods in 2010 and their consumption volumes in 1989, prior to the transition to the market economy. In each case, a major production increase is required. The consumption volumes for 1989 are estimates obtained by multiplying national per capita consumption volumes by the population. However, because much of the milk and dairy products consumed in rural areas is self-supplied, it is conceivable that in actuality more milk is used.

	1989 Consumption Volume (A)	2010 Estimated Demand Volume (B)	Demand Increase Ratio (B/A)
Meat, meat products:	195,000t	255,000t	1.3Xs
Milk, dairy products: (equivalent milk products)	253,000t	762,000t	3.0Xs

Eggs:	56 million eggs	158 million eggs	2.8Xs
Wheat flour, bread products: (equivalent wheat flour vol.)	221,000t	314,000t	1.4Xs
Potatoes:	57,000t	192,000t	3.4Xs
Vegetables:	45,000t	191,000t	4.2Xs

Furthermore, the following table shows the forecasted demands for the study area. It is estimated that these regions consume 42 - 55% of the national demand volume.

	2010 Estimated Demand Volume(A) (Nationwide)	2010 Estimated Demand Volume(B) (Study area)	Study Area's Share
Meat, meat products:	255,000t	115,000t	45%
Milk, dairy products:	762,000t	321,000t	42%
Eggs:	158 million eggs	88 million eggs	55%
Wheat flour, bread products:	314,000t	156,000t	50%
Potatoes:	192,000t	98,000t	51%
Vegetables:	191,000t	98,000t	51%

3 Production Forecasts

This section studies whether it will be possible for production volumes within the study area to satisfy the demand for staple agricultural and livestock products. The general view of the situation is that production in the study area exceeding their demand for agricultural products produced on farmlands will be possible. However, it will not be possible to satisfy the demand for livestock products, because livestock that can be raised within the study area is limited by the area of grassland available and other such factors. Therefore, it will be necessary to increase the number of intensive livestock raising enterprises that do not depend on grasslands, or, procure livestock or livestock products from outside the study area, as has been done to date. The results of production forecasts for each type of farm product are as follows.

1) Wheat

In forecasting the production volume of wheat from the equivalent volume of wheat flour demand, it is necessary to take into consideration product yield rates of wheat flour from wheat, losses during harvesting, sorting, and storage, and securing seed wheat. 265,000t of wheat are required to meet the 156,000t wheat flour demand in the study area. The current yield is 1.3t/ha. Assuming that fallow land accounts for 50% of the total arable land area, approximately 410,000 ha of farmland are

required to produce the study area's volume of demand for wheat flour alone. This is about half of the 787,000 ha of farmland in the study area in 1993. Taking into consideration improvements in fertilizer management, cultivation technology, and plant strains, as well as cultivation using irrigation facilities, it can be expected that the yield volume will also increase greatly by 2010. Therefore, it will be possible to also distribute wheat to supply the demand for wheat flour in outside regions not suited for wheat production and to allocate wheat for use as the raw material for alcohol and in assorted feed and other products. Export can also be imagined if there are any surpluses. Consequently, one can say that the study area possess ample production potential for grains such as wheat.

2) Potatoes

Regarding potato production and demand volume, it is necessary to take into consideration losses during harvesting, sorting, transportation, and storage and securing seed potatoes. 168,000t of potato production are required to meet the 98,000t potato demand in the study area. The current potato yield is 11t/ha. However, by 2010, the yield can be expected to be 25t/ha for irrigated land and 15t/ha for unirrigated land, as a result of improvements in plant strains and cultivation management technology. If unirrigated land is used, approximately 11,000 ha of farmland, a mere 1 - 2 % of the 787,000 ha of farmland within the study area, will be required to produce the 168,000t potato demand within the study area alone. Consequently, it will be possible to amply accommodate demand, including the demand in other regions where there are potato shortages.

3) Vegetables

Vegetables similarly suffer losses during harvest and storage and so on, and so, taking this into account, it is estimated that 140,000t of vegetable production will be required to satisfy the demand in the study area. If vegetables are cultivated using only irrigated land and the yield based mainly on cabbages is forecasted, an average harvest of 25t/ha can be expected by 2010. This will require approximately 6,000 ha of irrigated land. Since there are approximately 14,000 ha of irrigation facilities currently used within the study area, one can say that there is ample production potential.

4) Sugar Crops and Oil Crops

A plan to cultivate 5,000 ha of sugar beets and 6,500 ha of oil crops is being advanced under the State of Mongolia's policy to promote the production of sugar and oil crops. Within the study area, this plan

calls for 5,000 ha of sugar beets and 2,300 ha of oil crops. Because sugar beets cannot be cultivated on the same plot of land over and over, a every four year-crop rotation system conbined with other crops must be considered. Subsequently, a total of 20,000 ha of irrigation facilities will be required to cultivate 5,000 ha of sugar beets. There are approximately 14,000 ha of irrigation facilities currently used within the study area. If, however, facilities whose use is suspended for some reason or other at the present time are included, there are approximately 27,000 ha of irrigation facilities. Furthermore, according to a study by the State of Mongolia, there are approximately 110,000 ha of land that can be irrigated within the study area. Therefore, it will be possible to produce the sugar beet and oil crops by rehabilitating existing irrigation facilities or constructing new ones.

5) The Possibility of Introducing New Crops

At present, only a few varieties of crops are being cultivated in the surveyed regions due to restrictions imposed by weather conditions and existing dietary customs. However, new crops must be introduced in order to accommodate food diversification and improve the sugar and oil self-sufficiency rates hereafter.

In the study area, during the farming season (May to September), the aggregate temperature for days when the average temperature is 0℃ or higher is 1799℃ for Ulaanbaatar, 2194℃ for Baruunhara, 1848℃ for Bulgan, and 1872℃ for Arvayheer, all quite low sums. Therefore, new vegetable, sugar, and oil crops for these regions will be chosen from among crops suited for cool climates.

A new sugar crop to be introduced is sugar beets (Beta Vulgaris L. var sacchrifera Alef). Regarding the sugar beets, there have been six years of experimentation at PSARI and actual cultivation in Zuunhala, Selenge Aimag, and favorable results have been obtained for harvest yields and sugar content. Sugar beets are not only a raw material source of sugar, but their beet tops and beet pulp can also be used as feed.

A new oil crop being considered for introduction is flax (Linum usitatissinum L.). Good quality drying oi can be obtained from the seeds of this crop. This oil (linseed oil) can be used for both food and industrial purposes. Fibers can be obtained from its plant stems, and its pressed seed lees can be used as feed. The PSARI has conducted cultivation experiments on flax also, and their results have been favorable.

Some of the new vegetable crops being considered for introduction are Chinese cabbage (Brassica pekinensis Rupr), lettuce (Lactuca sativa L.), Japanese radish (Raphanus sativus L.), peas (Pisum sativum L.), kidney beans (Phaseolus vulgaris L.), and taasai Chinese leafy vegetable

(Brassica chinensis); some of the new spice crops being considered for introduction are parsley Petroselinum sativum Hoffm and honewort (Cryptotaenia canadensis DC).

6) Livestock Products (Meat, Milk, Dairy Products, etc.)

At present there are approximately 17,000,000 ha of natural grasslands within the study area. The dried grass (hay) that can be supplied by these grasslands amounts to 6.4 million tons if calculated by the method used in Mongolia. At present there are 5.7 million head of livestock (5 species of domesticated animals) in the study area (as of 1993); therefore, using the Mongolian method of calculation, 6.5 million tons of hay a year are required from the grasslands, and supply and demand are almost even. Since a supply of supplementary feed is necessary in addition to hay, it would be difficult to greatly increase the number of livestock by depending on only feed resources that can be produced within the study area.

As for meat, milk, and dairy products, demand in the study area accounts for 42 - 45% of the national total. From the viewpoint of the demand side, the development potential is extremely high. However, since the number of head of livestock in the study area accounts for only an approximately 23% share of the national total, only about half of the demand can be supplied if it is to be met by procuring livestock products from only livestock raised within the study area. Therefore, to cope with demand increases in the urban areas in the future, feed resources must be strengthened, mixed feed must be used, and intensive livestock breeding enterprises that do not depend on grassland resources must be promoted. In addition, the need will arise to satisfy demand by, more than ever, either transporting livestock and milk from the other areas to processing facilities in large cities or procuring livestock products processed in rural areas.

7) The Possibility of Intensive Livestock Farm

Production volumes have declined greatly in intensive livestock breeding fields such as dairy, hog, and poultry farming. A major reason for this is that after privatization, former state farms where privatized rapidly without any assistance measures to ensure stable management. This sector, including beef cattle raising, adapts well to corporate management, and so there is a good possibility that it will rebuild itself in the future, if related support measures are taken, such as providing low interest loans, setting up a system of supplying good quality feed, and establishing technological support systems related to improving livestock strains, livestock sanitation, business administration, and other technical areas.

Furthermore, the key is to provide good quality and low-priced

feed. However, in addition to feed resources such as grains produced in the study area, hopes can be placed on the possibility of producing protein feed, such as corn and soybeans, in eastern Mongolia and other regions in the future.

4.3.2 Land Use and Cropping Plans

Land use plans call for each of the prefectures to produce as much as possible of the foodstuffs its own residents consume, and ship in the food needed to make up for any shortages from neighboring prefectures by 2010.

Cropping plans divide the land into irrigated districts and non-irrigated districts, and take account of the land's utilization rate and the productivity of land.

Under land use plans by prefecture, land is categorized by prefecture and by block as follows. Crops planted in Block A in the first year are rotated successively to Block B in the second year, and to Block C in the third year.

The farm crop rotation system, one based on a rotation system by prefecture and by block, subdivides this crop rotation system, but it does not encompass everything adoptable.

Figure 4．3．2．1 Rotation Cropping System for Irrigated Land
Selenge／DK

Pattern	A	B	C	D	E
I 10,400ha	Sugarbeet 2,600	Wheat 1,100 Rape 1,100 Vegetble 400	Potato 2,600	Vegetble 2,600	
II 1,000ha	Cabbage Onion Turnip 200 Carrot Garlic	Onion Turnip Carrot 200 Garlic Cabbage	Turnip Carrot Garlic 200 Cabbage Onion	Carrot Garlic Cabbage 200 Onion Turnip	Garlic Cabbage Onion 200 Turnip Carrot
III 500ha	Wheat 50 Vegetble 200	Potato 250			
IV 400ha	Fruit 400				

Arable land 335,000ha Irrgated area12,300 Wheat 1,150 Potato2,850 Vegetble 4,200 Sugar Beet 2,600 Rape 1,100 Fruit 400

Non irrgated 322,700 Wheat 146,600 Potato 1,000 Fodder 67,540 Fallow 107,560

Tov/UB

Pattern	A	B	C	D	
I 1,400ha	Sugarbeet 350	Wheat 100 Rape 200 Vegetble 50	Potato 350	Vegetble 350	
II 1,000ha	Cabbage Onion Turnip 200 Carrot Garlic	Onion Turnip Carrot 200 Garlic Cabbage	Turnip Carrot Garlic 200 Cabbage Onion	Carrot Garlic Cabbage 200 Onion Turnip	Garlic Cabbage Onion 200 Turnip Carrot
III 400ha	Wheat 100 Vegetble 100	Potato 200			
IV 300ha	Fruit 300				

Arable land 300,000ha Irrgated area 3,100 Wheat 200 Potato 550 Vegetble 1,500 Sugar Beet 350 Rape 200 Fruit 300

Non irrgated 286,880 Wheat 147,300 Potato 6,500 Fodder 44,140 Fallow 98,960

Bulgan/OR

Pattern	A	B	C	D	
V 4,000ha	Sugarbeet 1,000	Wheat 1,000	Potato 500 Rape 500	Wheat 910 Potato 90	
II 640ha	Cabbage Onion Turnip 130 Carrot Garlic	Onion Turnip Carrot 130 Garlic Cabbage	Turnip Carrot Garlic 130 Cabbage Onion	Carrot Garlic Cabbage 130 Onion Turnip	Garlic Cabbage Onion 130 Turnip Carrot
VI 460ha	Wheat 230	Potato 230			

Arable land 111,000ha Irrgated area 5,100 Wheat 2,140 Potato 820 Vegetble 640 Sugar Beet 1,000 Rape 500

Non irrgated 286,880 Wheat 35,300 Fodder 35,300 Fallow 35,300

Ovorhangai

Pattern	A	B	C	D	
V 4,200ha	Sugarbeet 1,050	Wheat 1,050	Potato 540 Rape 510	Wheat 860 Vegetble 190	
II 300ha	Cabbage Onion Turnip 60 Carrot Garlic	Onion Turnip Carrot 60 Garlic Cabbage	Turnip Carrot Garlic 60 Cabbage Onion	Carrot Garlic Cabbage 60 Onion Turnip	Garlic Cabbage Onion 60 Turnip Carrot

Arable land 41,000ha Irrgated area 4,500 Wheat 1,910 Potato 540 Vegetble 490 Sugar Beet 1,050 Rape 510

Non irrgated 36,500 Wheat 9,600 Fodder 14,730 Fallow 12,170

Figure 4. 3. 2. 2 Rotation Cropping System for Non-Irrigated Land

1. Selenge/DK

Pattern	A		B		C		D		E	
Ⅶ 4,000ha	Wheat	250	Fallow	250	Potato	250	Fallow	250		
	Fallow	250	Potato	250	Fallow	250	Wheat	250		
	Potato	250	Fallow	250	Wheat	250	Fallow	250		
	Fallow	250	Wheat	250	Fallow	250	Potato	250		
Ⅷ 291,200ha	Wheat	48,530	Fallow	33,340	Fodder	15,190				
	Fallow	33,340	Fodder	15,190	Wheat	48,530				
	Fodder	15,200	Wheat	48,540	Fallow	33,340				
Ⅸ 27,500ha	Fodder	1,100	Fodder	1,100	Fodder	1,100	Fodder	1,090	Fallow	1,100
	Fodder	1,100	Fodder	1,100	Fodder	1,090	Fallow	1,110	Fodder	1,100
Dairyfarming	Fodder	1,100	Fodder	1,090	Fallow	1,110	Fodder	1,100	Fodder	1,100
7,700ha	Fodder	1,090	Fallow	1,110	Fodder	1,100	Fodder	1,100	Fodder	1,100
	Fallow	1,110	Fodder	1,100	Fodder	1,100	Fodder	1,100	Fodder	1,100

2 T o v / U.B

Pattern	A	B	C	D	E	F
VII 19,500 ha	Wheat 2,170 Fallow 2,170 Potato 2,160	Fallow 2,170 Potato 2,170 Wheat 2,160	Potato 2,170 Wheat 2,170 Fallow 2,160			
X 106,520ha	Wheat 26,630 Fallow 26,630	Fallow 26,630 Wheat 26,630				
X 45,180ha	Wheat 5,020 Wheat 5,020 Fallow 5,020	Wheat 5,020 Fallow 5,020 Wheat 5,020	Fallow 5,020 Wheat 5,020 Wheat 5,020			
VIII 95,700ha	Wheat 3,820 Wheat 3,830 Fallow 3,830 Wheat 3,830 Fodder 3,830	Wheat 3,820 Fallow 3,830 Wheat 3,830 Fodder 3,830 Wheat 3,830	Fallow 3,820 Wheat 3,830 Fodder 3,830 Wheat 3,830 Wheat 3,830	Wheat 3,820 Fodder 3,830 Wheat 3,830 Wheat 3,830 Fallow 3,830	Fodder 3,820 Wheat 3,830 Wheat 3,830 Fallow 3,830 Wheat 3,830	
IX 30,000ha Dairyfarming 21,890ha	Fodder 1,000 Fodder 1,000 Fodder 1,000 Fodder 1,000 Fodder 1,000 Fallow 1,000	Fodder 1,000 Fodder 1,000 Fodder 1,000 Fodder 1,000 Fallow 1,000 Fodder 1,000	Fodder 1,000 Fodder 1,000 Fodder 1,000 Fallow 1,000 Fodder 1,000 Fodder 1,000	Fodder 1,000 Fodder 1,000 Fallow 1,000 Fodder 1,000 Fodder 1,000 Fodder 1,000	Fodder 1,000 Fallow 1,000 Fodder 1,000 Fodder 1,000 Fodder 1,000 Fodder 1,000	Fallow 1,000 Fodder 1,000 Fodder 1,000 Fodder 1,000 Fodder 1,000 Fodder 1,000

3 Bulga

Pattern	A	B	C	D	E
X 40,000ha	Wheat 10,000 Fallow 10,000	Fallow 10,000 Wheat 10,000			
VIII 30,600ha	Wheat 5,100 Fodder 2,350 Fallow 2,750	Fodder 2,350 Fallow 2,750 Wheat 5,100	Fallow 2,740 Wheat 5,100 Fodder 2,360		
IX 35,300ha Dairyfarming 1,750ha	Fodder 1,420 Fodder 1,410 Fodder 1,410 Fodder 1,410 Fallow 1,410	Fodder 1,420 Fodder 1,410 Fodder 1,410 Fallow 1,410 Fodder 1,410	Fodder 1,420 Fodder 1,410 Fallow 1,410 Fodder 1,410 Fodder 1,410	Fodder 1,420 Fallow 1,410 Fodder 1,410 Fodder 1,410 Fodder 1,410	Fallow 1,420 Fodder 1,410 Fodder 1,410 Fodder 1,410 Fodder 1,410

4 Ovorhangai

Pattern	A		B		C		D		E	
X 10,300ha	Wheat	2,580	Fallow	2,580						
	Fallow	2,570	Wheat	2,570						
VII 13,350ha	Wheat	1,490	Fodder	1,490	Fallow	1,490				
	Fodder	1,480	Fallow	1,480	Wheat	1,480				
	Fallow	1,480	Wheat	1,480	Fodder	1,480				
IX 12,850ha	Fodder	520	Fodder	520	Fodder	520	Fodder	520	Fallow	520
	Fodder	520	Fodder	520	Fodder	520	Fallow	520	Fodder	520
Dairyfarming	Fodder	510	Fodder	510	Fallow	510	Fodder	510	Fodder	510
1,310ha	Fodder	510	Fallow	510	Fodder	510	Fodder	510	Fodder	510
	Fallow	510	Fodder	510	Fodder	510	Fodder	510	Fodder	510

4.3.4 Production Infrastructure Improvement Plans

4.3.4.1 Irrigation Development Plan

Through consultations with counterpart personnel of the Mongolian side, the selection was made from among all areas surveyed by the Government of Mongolia based on the following selection criteria.

[1] There are rich water resources such as a river and lake.

[2] The soil is suitable for agriculture.

[3] It is close to a trunk transportation line so that the goods produced can be distributed.

[4] It conforms with the nation's agricultural policies.

(Table 4.3.4.1)

Areas which should be improved by the year 2000 were selected considering the presence or absence of irrigation

Table 4.3.4.1 Selection of Irrigation Areas (Surveyed Areas) (1/3)

AIMAG NUMBER on Map	SUM (DISTRICT)	SCHEME NAME	REGISTERED AREA (ha)	IRRIGATION FACILITIES CONSTRUCTED AREA (ha) MECHANICAL IRRI	GRAVITY IRRI.	TOTAL	WATER RESOURCE (RIVER,WELL, etc.)	WATER VOLUME m3/s	SELECTION CRITERIA ① WATER	② SOIL	③ ACCESS.	④ STRATEGY	AREA (ha)	REMARKS (ADB project, sugarbeet project)
SELENGE														
S-3	Altanbulag	Bor bulan	800.0	-	825.0	825.0	Uyaraan gol (r)	0.620	B	A	A		200.0	
S-4	Altanbulag	Dros davaa	500.0	216.0	-	216.0	Uyaraan gol (r)	0.620	B	A	A		150.0	
S-5	Altanbulag	Ulaan burgas	50.0	50.0	-	50.0	Uiagt gol(r)	0.019	B	A	B		50.0	
S-6	Javhlant	Huytniy gol	60.0	-	100.0	100.0	Uuitnii gol (r)	0.038	B	A	B		20.0	
S-10	Bayangol	Bayangol	80.0	-	15.0	15.0	Bayangol (r,W)	0.064	B	A	A		50.0	
S-11	Bayangol	Dzagdal gol	76.0	76.0	-	76.0	Zagdalgol (r)	0.184	A	A	A		76.0	ADB
S-12	Baruun burenmnn	Dzuunmod	1,000.0	666.0	-	666.0	Burgaltai (r)	1.000	A	B	B		300.0	
S-17	Mandal	Shar tohoi	800.0	1,034.0	-	1,034.0	Haraa (r)	7.000	A	A	A	A	500.0	No1,No2,Zuunharaa
S-18	Mandal	Borogiin hondii	1,400.0	-	-	-	Haraa (r)	7.000	B	A	A		100.0	
S-19	Mandal	Tereetiin holgor	1,500.0	-	-	-	Haraa (r)	7.000	A	B	A	A	400.0	No3 Zuunharaa
S-21	Dzuun buren	Bongiin tohoi	3,000.0	-	-	-	Selenge (r)	250.000	A	A	B		2,500.0	
S-22	Dzuun buren	Sumiin bulan	500.0	-	20.0	20.0	Selenge (r)	250.000	A	A	B		20.0	
S-23	Dzuun buren	Orkhon selengiin belchir	3,000.0	-	-	-	Selenge (r)	250.000	A	A	B		1,000.0	
S-24	Dzelter	Hadan hoshuu	10.0	-	60.0	60.0	Hadan hoshuu (r)		B	A	B		10.0	
S-32	Yeroo	Shaazgait	15.0	-	10.0	10.0	Shaazgait (r)	0.050	A	A	C		15.0	
S-33	Tsagaan nuur	Tiireg hondii	6,000.0	-	10.0	10.0	Selenge (r)	250.000	A	A	B		3,000.0	
S-39	Saihan	Hoshoo chuluu	20.0	-	-	-	Haraa (r)	7.000	A	A	B		20.0	
S-42	Orkhon	Shiilegiin gol	80.0	-	30.0	30.0	Shiir (r)	0.060	B	A	B		20.0	
S-44	Orkhontuul	Tsagaan ereg	400.0	-	5.0	5.0	Tuul (r)	99.100	A	A	B		10.0	
S-50	Sant	Hushaat	100.0	-	60.0	60.0	Hushaat (r)	0.060	A	A	B		60.0	
S-51	Sant	Yeven	3,300.0	3,300.0	-	3,300.0	Orkhon (r)	99.100	A	A	B	A	2,685.0	No4 Chagaantorgoi
S-56	Shaamar	Yanj dotor tal	300.0	-	60.0	60.0	Orkhon (r)	145.000	A	A	B		20.0	
S-57	Shaamar	Shaamar	85.0	61.0	-	61.0	Orkhon (r)	145.000	A	A	A		41.0	ADB
S-62	Huder	Shorgoolj	500.0	-	500.0	500.0	Tumurt (r)	1.160	A	A	C		40.0	
SUBTOTAL			24) 23,576.0	7) 5,403.0	12) 1,695.0	19) 7,098.0							11,287.0	
DARKHAN-UUL														
S-14	Hongorsum	Buurt	130.0	130.0	-	130.0			B	B	C		130.0	
S-15	Hongorsum	Hongoryn gol	280.0	201.0	-	201.0	Haraa gol (r)	7.000	A	A	A		201.0	
S-58	Orkhon	Sharyn gol	622.0	436.0	-	436.0	Sharyn gol (r)		A	A	A		400.0	ADB
S-59	Orkhon	79 in tohoi	100.0	58.0	-	58.0	Orkhon gol (r)		A	A	A		58.0	
S-60	Orkhon	Buren tolgoi	600.0	360.0	-	360.0	Haraa gol (r)	7.000	A	C	C	B	100.0	ADB
SUBTOTAL			5) 1,732.0	5) 1,185.0	)	5) 1,185.0							889.0	
TOV														
T-4	Erdene	Dugan tsagaan	300.0	-	-	-	Terelj gol (r)	5.870	A	B	A		100.0	
T-7	Erdene	Uu bulan	100.0	36.0	-	36.0	Tuul gol (r)	15.200	A	A	A		20.0	
T-11	Bayandelger	Togosin booloi	-	72.0	-	72.0	Tal bulag (w)		B	B	B		40.0	
T-24	Arhust	Shunkhlai	2.0	-	7.7	7.7	Shunhulai bulag (s)	0.001	C				2.0	
T-32	Lun	Burkhantiin 3 tohoi	10.0	-	4.0	4.0	Tuul gol (r)	15.200	A	B	A		10.0	
T-41	Ugtaal tsaidam	Bor hujir	5.0	-	15.0	15.0	Borhujir gol (r)		B	A	A		10.0	
T-46	Dzaanar	Ar urt	125.0	125.0	-	125.0	Arurt gol (r)		B	B	B		60.0	
T-49	Yseel	Bor gol	20.0	-	24.0	24.0	Bor Hujir gol (r)		B	A	A		20.0	
T-50	Jargalant	Teeliin gol	100.0	-	4.5	4.5	Teel gol (r)	0.037	B	A	B		10.0	
T-54	Jargalant	Jargalant	850.0	850.0	-	850.0	Jargalant gol (r)		B	A	A	A	240.0	No9 Jargalant
T-55	Sumber	Huts uhnat	70.0	-	8.3	8.3	Zagdal gol (r)	0.315	A	A	A		15.0	
T-57	Bayantsogt	Dund urt	40.0	57.0	-	57.0	Dund urt gol (r)	0.006	C	B	A		20.0	
T-59	Bayantsogt	Guna	70.0	70.0	-	70.0	Gunyn gol (r)		C	B	B		40.0	
T-60	Batsumber	Mandalyn uhaa	200.0	-	120.0	120.0	Sugnugur gol (r)	0.335	A	A	B		100.0	

Table 4.3.4.1 Selection of Irrigation Areas (Surveyed Areas) (2/3)

AIMAG NUMBER on Map	SUM (DISTRICT)	SCHEME NAME	REGISTERED AREA (ha)	IRRIGATION FACILITIES CONSTRUCTED AREA (ha) MECHANICAL IRRI	GRAVITY IRRI.	TOTAL	WATER RESOURCE (RIVER,WELL, etc.)	WATER VOLUME m3/s	SELECTION CRITERIA ① WATER	② SOIL	③ ACCESS.	④ STRATEGY	AREA (ha)	REMARKS (ADB project, sugarbeet project)
T-61	Batsumber	Dugan davaa	300.0	-	-	-	Sugnugur gol (r)	0.335	A	A	B		300.0	
T-64	Batsumber	Bayangol	100.0	34.0	-	34.0	Bayangol (r)	0.222	A	A	B		100.0	
T-66	Batsumber	Mandal	802.0	802.0	-	802.0	Mandal gol (r)	0.182	B	A	B	A	350.0	No5 Batsumber
T-67	Batsumber	Bayantolgoi	257.0	250.0	-	250.0	Bayantolgoi (r)		B	A	A	A	180.0	No6 Bayantolgoi
T-69	Bayan chandmani	Dzuun muhar	30.0	-	28.8	28.8	Zuun muhar gol (r)	0.003	C	A	B		10.0	
T-82	Bayan chandmani	Shariin am	60.0	-	60.5	60.5	Sharyn gol (r)		B	A	A		60.0	ADB
T-71	Altanbulag	Bohog gol	70.0	-	8.0	8.0	Buhug gol (r)	0.108	B	B	A		10.0	
T-84	Bornuur	Bornuur	966.0	966.0	-	966.0	Boroo gol (r)		B	A	A		450.0	ADB, No8 Bornuur
SUBTOTAL			21) 4,477.0	10) 3,262.0	10) 280.8	20) 3,542.8							2,147.0	
ULAANBAATAR														
UL-1	Han uul	Shuvuun fabric	500.0	339.0	-	339.0	Tuul gol (r)	15.200					339.0	
UL-2	Songino hairhan	Ayushiin am	175.0	175.0	-	175.0	Spring and lake wate						50.0	
UL-3	Songino hairhan	Rashaant	80.0	63.0	-	63.0	(w)						60.0	
UL-8	Bayan dzurh	Ovor bayan	120.0	74.0	-	74.0	(w)						50.0	
SUBTOTAL			4) 875.0	4) 651.0	-	4) 651.0							499.0	
BULGAN														
B-1	Bayan agt	Havtsgait	2,560.0	74.0	-	74.0	Havtsgait	0.023	B	A	B		40.0	
B-4	Bayan agt	Balig	60.0	-	5.0	5.0	Bulig	0.124	A	A	A		60.0	
B-7	Bugat	Maanit	50.0	-	21.0	21.0	Maanit	0.014	B	A	A		14.0	
B-8	Bugat	Hujirt	100.0	-	40.0	40.0	Hujirt	0.015	B	A	A		15.0	
B-11	Bureg hangai	Dzajiin tal	3,200.0	-	6.0	6.0	Dzajiin	0.060	B	A			60.0	
B-13	Bureg hangai	Yamaat	80.0	-	-	-	Yamaat	0.209	A	A	B		80.0	
B-14	Burvan bulag	Sain turuu	50.0	-	13.0	13.0	Sain turuunii	0.045	B	A	A	A	30.0	
B-18	Dashinchilen	Myalaan gol	60.0	-	4.0	4.0	Milan	0.043	B	A			40.0	
B-20	Hogod	Bosgo	10.0	-	7.0	7.0	Huitnii	0.007	B	A	B		7.0	
B-22	Orkhon	Tochekiin hotgor	350.0	85.0	-	85.0	Shuvuut	0.526	A	A	A		350.0	ADB
B-23	Orkhon	Seeriin gol	147.0	48.0	-	48.0	Seeriin	0.025	B	A	A		25.0	
B-24	Orkhon	Jargalant	100.0	-	150.0	150.0	Jargalant	0.100	B	A			100.0	
B-25	Orkhon	Hogoin gol	100.0	-	-	-	Hogoin	0.158	A	A			100.0	
B-26	Saihan	Hoid urd tal bulag	600.0	-	5.0	5.0	tal bulag	0.015	B	A			10.0	
B-36	Teshig	Suujiin bulag	20.0	-	29.0	29.0	Suujiin	0.023	A	A	B		20.0	
B-49	Hangal	Bayan nug	30.0	-	17.0	17.0	Sevcuul	0.035	B	A	A		35.0	
B-51	Hishig ondor	Sharhain gol	150.0	-	30.0	30.0	Sharhain	0.088	B	A	B		50.0	
B-59	Selenge	Inget gol	2,000.0	-	-	-	Selenge	88.000	A	A	B		2,000.0	
B-60	Selenge	Inget goliin adag	250.0	-	10.0	10.0	Inget	0.036	B	A	A		30.0	
B-70	Hutag	Teeliin gol	1,000.0	-	200.0	200.0	Teel	0.146	B	A	B		140.0	
B-73	Hutag	Tongor ovoo	1,400.0	-	-	-	Tgiin	81.000	A	A	C		1,000.0	
B-77	Hutag	Ih tolbor tsagaan bulan	800.0	-	300.0	300.0	Ih tolbor,Selenge	0.343,68.0	A	A	B		300.0	
B-81	Bayannuur	Dalain gol	50.0	57.0	-	57.0			B	A	A		50.0	
B-82	Bulgan	Achuutiin gol	100.0	-	-	-	Achuut	0.010	B	A	A		10.0	
SUBTOTAL			24) 13,267.0	4) 264.0	15) 837.0	19) 1,101.0							4,566.0	
ORKHON														
B-83	Jargalant	Ulaan tolgoi	547.0	547.0	-	547.0							547.0	No7 Ulaantolgoi
SUBTOTAL			1) 547.0	1) 547.0		1) 547.0							547.0	

Table 4.3.4.1 Selection of Irrigation Areas (Surveyed Areas) (3/3)

AIMAG NUMBER on Map	SUM (DISTRICT)	SCHEME NAME	REGISTERED AREA (ha)	IRRIGATION FACILITIES CONSTRUCTED AREA (ha) MECHANICAL IRRI.	GRAVITY IRRI.	TOTAL	WATER RESOURCE (RIVER,WELL, etc.)	WATER VOLUME m3/s	SELECTION CRITERIA ① WATER	② SOIL	③ ACCESS.	④ STRATEGY	AREA (ha)	REMARKS (ADB project, sugarbeet project)
OVORHANGAI														
OV-2	Baruun bayan ulaan	Taatsyn bor zalaa	200.0	-	53.0	53.0	Taatsun	0.600	A	B	B		40.0	
OV-7	Bat uldzii	Ongotsot	100.0	-	30.0	30.0	Dund us	0.007	B	B	A		10.0	
OV-8	Bayangol	Talyn budgiin tal	600.0	-	2.0	2.0	Ongiin	1.000	A	B			2.0	
OV-12	Bayan ondor	Bor hujir	7.0	-	20.0	20.0	Bor hujir	0.002		A			2.0	
OV-16	Bogd	Hovd gol'i	60.0	-	5.0	5.0	Hovd	0.033	B	C			3.0	
OV-18	Bogd	Ird ulaan bulag	20.0	-	5.0	5.0	Bulag	0.007	B	B			3.0	
OV-23	Burd	Tarian tolgoi	100.0	-	50.0	50.0	Chuluut	0.040	B	A			30.0	
OV-27	Buchin us	Arguin golin hoyoo	-	-	10.0	10.0	Arguin	0.086	B	C			10.0	
OV-28	Dzuil	Saryn hondii	200.0	74.0	-	74.0	Jargalant	0.106	A	A	A		74.0	
OV-39	Dzuun bayan ulaan	Hayrhany uzuur	600.0	-	-	-	Ondi	1.000	A	B	A		10.0	
OV-40	Hariintel	Hurentolgoi	30.0	-	20.0	20.0	Shargai	0.040	A	B	B		10.0	
OV-43	Uldziit	Huisiin gol	65.0	-	5.0	5.0	Huis	0.040	A	A	B		20.0	
OV-47	Taragt	Arvain tal	120.0	120.0	2.0	122.0			C	B			5.0	
OV-50	Taragt	Dairgany gol	70.0	-	70.0	70.0	Dairgany	0.020	B	B	A		20.0	
OV-51	Togrog	Nazar	100.0	37.0	-	37.0	Nazar	-	B	B	A		37.0	
OV-57	Uyanga	Tarimal	300.0	-	-	-	Tarimaliin		B	A	C		5.0	
OV-62	Hairhan dulaan	Nariin gol	32.0	-	10.0	10.0	Nariin	0.010	B	A	A		10.0	
OV-64	Harhorin	Hogshnii hondii	8,150.0	8,150.0	-	8,150.0	Orhon	32.300	A	A			4,000.0	
OV-72	Hodzirt	Tsuurai	400.0	219.0	-	219.0	Stuurait	0.037	B	A			219.0	
SUBTOTAL			18) 11,154.0	5) 8,600.0	13) 282.0	* 18) 8,882.0							4,510.0	
TOTAL			97) 55,628.0	36) 19,912.0	50) 3,094.8	* 86)23,006.8							24,445.0	

Note:) shows the number of schemes

A:good, B:mean, C:poor

*:Number of schemes takes a count of double if the schemes irrigated by Mechanical and Gravity

Table 4.3.4.2 Areas to be developed by 2000 and 2010 (1/3)

AIMAG NUMBER on Map	REGISTERED AREA (ha)	AREA TO BE DEVELOPED AND IMPROVED (ha)			CULTIVATED AREA AS OF 1993 (ha)			AREA TO BE DEVELOPED by 2000 (ha)			AREA TO BE DEVELOPED from 2001 to 2010		
		MECHANICAL IRRI	GRAVITY IRRI.	TOTAL	MECHANICAL IRR	GRAVITY IRRI.	TOTAL	MECHANICAL IRR	GRAVITY IRRI.	TOTAL	MECHANICAL IRR	GRAVITY IRRI.	TOTAL
SELENGE													
S-3	800.0	-	200.0	200.0	-			-				200.0	200.0
S-4	500.0	150.0	-	150.0	216.0	-	216.0	150.0	-	150.0			
S-5	50.0	50.0	-	50.0	50.0	-	50.0	50.0	-	50.0			
S-6	60.0	-	20.0	20.0	-	3.5	3.5	-	3.5	3.5		16.5	16.5
S-10	80.0	-	50.0	50.0	-	15.0	15.0	-	15.0	15.0		35.0	35.0
S-11	76.0	76.0	-	76.0	76.0	-	76.0	76.0	-	76.0			
S-12	1,000.0	300.0	-	300.0	666.0	-	666.0	300.0	-	300.0			
S-17	800.0	500.0	-	500.0	544.0	-	544.0	500.0	-	500.0			
S-18	1,400.0	-	100.0	100.0	-			-				100.0	100.0
S-19	1,500.0	-	400.0	400.0	-			-				400.0	400.0
S-21	3,000.0	-	2,500.0	2,500.0	-			-				2,500.0	2,500.0
S-22	500.0	-	20.0	20.0	-	20.0	20.0	-	20.0	20.0			
S-23	3,000.0	-	1,000.0	1,000.0	-			-				1,000.0	1,000.0
S-24	10.0	-	10.0	10.0	-	4.0	4.0	-	4.0	4.0		6.0	6.0
S-32	15.0	-	15.0	15.0	-	5.0	5.0	-	5.0	5.0		10.0	10.0
S-33	6,000.0	-	3,000.0	3,000.0	-	7.0	7.0	-	7.0	7.0		2,993.0	2,993.0
S-39	20.0	-	20.0	20.0	-			-				20.0	20.0
S-42	80.0	-	20.0	20.0	-	7.0	7.0	-	7.0	7.0		13.0	13.0
S-44	400.0	-	10.0	10.0	-	2.0	2.0	-	2.0	2.0		8.0	8.0
S-50	100.0	-	60.0	60.0	-	5.0	5.0	-	5.0	5.0		55.0	55.0
S-51	3,300.0	2,685.0	-	2,685.0	2,685.0	-	2,685.0	2,685.0	-	2,685.0			
S-56	300.0	-	20.0	20.0	-			-				20.0	20.0
S-57	85.0	41.0	-	41.0	41.0	-	41.0	41.0	-	41.0			
S-62	500.0	-	40.0	40.0	-			-				40.0	40.0
SUBTOTAL	24) 23,576.0	7) 3,802.0	17) 7,485.0	24)11,287.0	7) 4,278.0	9) 68.5	16) 4,346.5	7) 3,802.0	9) 68.5	16) 3,870.5	)	16) 7,416.5	16) 7,416.5
DARKHAN-UUL													
S-14	130.0	130.0	-	130.0	130.0	-	130.0	130.0	-	130.0			
S-15	280.0	201.0	-	201.0	201.0	-	201.0	201.0	-	201.0			
S-58	622.0	400.0	-	400.0	436.0	-	436.0	400.0	-	400.0			
S-59	100.0	58.0	-	58.0	58.0	-	58.0	58.0	-	58.0			
S-60	600.0	100.0	-	100.0	360.0	-	360.0	100.0	-	100.0			
SUBTOTAL	5) 1,732.0	5) 889.0	)	5) 889.0	5) 1,185.0	)	5) 1,185.0	5) 889.0	)	5) 889.0	)	)	)
TOV													
T-4	300.0	-	100.0	100.0	-			-				100.0	100.0
T-7	100.0	20.0	-	20.0	36.0	-	36.0	20.0	-	20.0			
T-11	-	40.0	-	40.0	72.0	-	72.0	40.0	-	40.0			
T-24	2.0	-	2.0	2.0	-	7.7	7.7	-	2.0	2.0			
T-32	10.0	-	10.0	10.0	-	2.9	2.9	-	2.9	2.9		7.1	7.1
T-41	5.0	-	10.0	10.0	-	15.0	15.0	-	10.0	10.0			
T-46	125.0	60.0	-	60.0	125.0	-	125.0	60.0	-	60.0			
T-49	20.0	-	20.0	20.0	-	24.0	24.0	-	20.0	20.0			
T-50	100.0	-	10.0	10.0	-	4.5	4.5	-	4.5	4.5		5.5	5.5
T-54	850.0	240.0	-	240.0	532.0	-	532.0	240.0	-	240.0			
T-55	70.0	-	15.0	15.0	-	8.3	8.3	-	8.3	8.3		6.7	6.7
T-57	40.0	20.0	-	20.0	57.0	-	57.0	20.0	-	20.0			
T-59	70.0	40.0	-	40.0	70.0	-	70.0	40.0	-	40.0			
T-60	200.0	-	100.0	100.0	-	120.0	120.0	-	100.0	100.0			

Table 4.3.4.2 Areas to be developed by 2000 and 2010 (2/3)

AIMAG NUMBER on Map	REGISTERED AREA (ha)	AREA TO BE DEVELOPED AND IMPROVED (ha)			CULTIVATED AREA AS OF 1993 (ha)			AREA TO BE DEVELOPED by 2000 (ha)			AREA TO BE DEVELOPED from 2001 to 2010		
		MECHANICAL IRR	GRAVITY IRRI.	TOTAL	MECHANICAL IRR	GRAVITY IRRI.	TOTAL	MECHANICAL IRR	GRAVITY IRRI.	TOTAL	MECHANICAL IRR	GRAVITY IRRI.	TOTAL
T-61	300.0	-	300.0	300.0	-			-				300.0	300.0
T-64	100.0	100.0	-	100.0	22.0	-	22.0	22.0	-	22.0	78.0		78.0
T-66	802.0	350.0	-	350.0	386.0	-	386.0	350.0	-	350.0			
T-67	257.0	180.0	-	180.0	250.0	-	250.0	180.0	-	180.0			
T-69	30.0	-	10.0	10.0	-	28.8	28.8	-	10.0	10.0			
T-82	60.0	-	60.0	60.0	-	60.5	60.5	-	60.0	60.0			
T-71	70.0	-	10.0	10.0	-	8.0	8.0	-	8.0	8.0		2.0	2.0
T-84	966.0	450.0	-	450.0	900.0	-	900.0	450.0	-	450.0			
SUBTOTAL	21) 4,477.0	10) 1,500.0	12) 647.0	22) 2,147.0	10) 2,450.0	10) 279.7	20) 2,729.7	10) 1,422.0	10) 225.7	20) 1,647.7	1) 78.0	6) 421.3	7) 499.3
ULAANBAATAR													
UL-1	500.0	339.0	-	339.0	339.0	-	339.0	339.0	-	339.0			
UL-2	175.0	50.0	-	50.0	150.0	-	150.0	50.0	-	50.0			
UL-3	80.0	60.0	-	60.0	63.0	-	63.0	60.0	-	60.0			
UL-8	120.0	50.0	-	50.0	74.0	-	74.0	50.0	-	50.0			
SUBTOTAL	4) 875.0	4) 499.0	-	4) 499.0	4) 626.0	-	4) 626.0	4) 499.0	)	4) 499.0	)	)	)
BULGAN													
B-1	2,560.0	40.0	-	40.0		-			-		40.0		40.0
B-4	60.0	-	60.0	60.0		2.1	2.1	-	2.1	2.1		57.9	57.9
B-7	50.0	-	14.0	14.0	-	7.0	7.0	-	7.0	7.0		7.0	7.0
B-8	100.0	-	15.0	15.0	-			-				15.0	15.0
B-11	3,200.0	-	60.0	60.0	-	0.3	0.3	-	0.3	0.3		59.7	59.7
B-13	80.0	-	80.0	80.0	-			-				80.0	80.0
B-14	50.0	-	30.0	30.0	-			-				30.0	30.0
B-18	60.0	-	40.0	40.0	-			-				40.0	40.0
B-20	10.0	-	7.0	7.0	-	3.0	3.0	-	3.0	3.0		4.0	4.0
B-22	350.0	350.0	-	350.0	85.0	-	85.0	85.0	-	85.0	265.0		265.0
B-23	147.0	25.0	-	25.0		-			-		25.0		25.0
B-24	100.0	-	100.0	100.0	-	22.0	22.0	-	22.0	22.0		78.0	78.0
B-25	100.0	-	100.0	100.0	-			-				100.0	100.0
B-26	600.0	-	10.0	10.0	-	2.0	2.0	-	2.0	2.0		8.0	8.0
B-36	20.0	-	20.0	20.0	-			-				20.0	20.0
B-49	30.0	-	35.0	35.0	-			-				35.0	35.0
B-51	150.0	-	50.0	50.0	-	1.8	1.8	-	1.8	1.8		48.2	48.2
B-59	2,000.0	-	2,000.0	2,000.0	-			-				2,000.0	2,000.0
B-60	250.0	-	30.0	30.0	-	2.3	2.3	-	2.3	2.3		27.7	27.7
B-70	1,000.0	-	140.0	140.0	-			-				140.0	140.0
B-73	1,400.0	-	1,000.0	1,000.0	-			-				1,000.0	1,000.0
B-77	800.0	-	300.0	300.0	-	20.0	20.0	-	20.0	20.0		280.0	280.0
B-81	50.0	50.0	-	50.0	51.0	-	51.0	50.0	-	50.0			
B-82	100.0	-	10.0	10.0	-			-				10.0	10.0
SUBTOTAL	24) 13,267.0	4) 465.0	20) 4,101.0	24) 4,566.0	2) 136.0	9) 60.5	11) 196.5	2) 135.0	9) 60.5	11) 195.5	3) 330.0	20) 4,040.5	23) 4,370.5
ORKHON													
B-83	547.0	547.0	-	547.0	547.0	-	547.0	547.0		547.0			
SUBTOTAL	1) 547.0	1) 547.0		1) 547.0	1) 547.0		1) 547.0	1) 547.0	)	1) 547.0			

Table 4.3.4.2 Areas to be developed by 2000 and 2010 (3/3)

AIMAG NUMBER on Map	REGISTERED AREA (ha)	AREA TO BE DEVELOPED AND IMPROVED (ha)			CULTIVATED AREA AS OF 1993 (ha)			AREA TO BE DEVELOPED by 2000 (ha)			AREA TO BE DEVELOPED from 2001 to 2010		
		MECHANICAL IRRI	GRAVITY IRRI.	TOTAL	MECHANICAL IRR	GRAVITY IRRI.	TOTAL	MECHANICAL IRR	GRAVITY IRRI.	TOTAL	MECHANICAL IRR	GRAVITY IRRI.	TOTAL
OVORHANGAI													
OV-2	200.0	-	40.0	40.0	-	23.0	23.0	-	23.0	23.0		17.0	17.0
OV-7	100.0	-	10.0	10.0	-			-				10.0	10.0
OV-8	600.0	-	2.0	2.0	-			-				2.0	2.0
OV-12	7.0	-	2.0	2.0	-	10.0	10.0	-	2.0	2.0			
OV-16	60.0	-	3.0	3.0	-			-				3.0	3.0
OV-18	20.0	-	3.0	3.0	-			-				3.0	3.0
OV-23	100.0	-	30.0	30.0	-	50.0	50.0	-	30.0	30.0			
OV-27	-	-	10.0	10.0	-			-				10.0	10.0
OV-28	200.0	74.0	-	74.0	74.0	-	74.0	74.0	-	74.0			
OV-39	600.0	-	10.0	10.0	-			-				10.0	10.0
OV-40	30.0	-	10.0	10.0	-			-				10.0	10.0
OV-43	65.0	-	20.0	20.0	-	5.0	5.0	-	5.0	5.0		15.0	15.0
OV-47	120.0	-	5.0	5.0	-	2.0	2.0	-	2.0	2.0		3.0	3.0
OV-50	70.0	-	20.0	20.0	-	50.0	50.0	-	20.0	20.0			
OV-51	100.0	37.0	-	37.0	37.0	-	37.0	37.0	-	37.0			
OV-57	300.0	-	5.0	5.0	-			-				5.0	5.0
OV-62	32.0	-	10.0	10.0	-	10.0	10.0	-	10.0	10.0			
OV-64	8,150.0	4,000.0	-	4,000.0	3,235.0	-	3,235.0	3,235.0	-	3,235.0	765.0		765.0
OV-72	400.0	219.0	-	219.0	219.0	-	219.0	219.0	-	219.0			
SUBTOTAL	18) 11,154.0	4) 4,330.0	15) 180.0	19) 4,510.0	4) 3,565.0	7) 150.0	11) 3,715.0	4) 3,565.0	7) 92.0	11) 3,657.0	1) 765.0	11) 88.0	12) 853.0
TOTAL	97) 55,628.0	35) 12,032.0	64) 12,413.0	99) 24,445.0	33) 12,787.0	35) 558.7	68) 13,345.7	33) 10,859.0	35) 446.7	68) 11,305.7	5) 1,173.0	53) 11,966.3	58) 13,139.3

Table 4.3.4.3 Selection of Irrigation Areas (Unsurveyed Areas)

AIMAG NUMBER on Map	SUM (DISTRICT)	SCHEME NAME	REGISTERED AREA (ha)	IRRIGATION FACILITIES CONSTRUCTED AREA (ha) MECHANICAL IRRI.	GRAVITY IRRI.	TOTAL	WATER RESOURCE (RIVER, WELL, etc.)	WATER VOLUME m3/s	SELECTION CRITERIA ① WATER	② SOIL	③ ACCESS.	④ STRATEGY	AREA (ha)	REMARKS (ADB project, sugarbeet project)
DARKHAN-UUL														
S-64	Hongor	Ajahuin tuv			10.2	10.2							10.2	
S-65	Orhon	Hotiin tuv			8.4	8.4							8.4	
S-66	Nairamdal	Hotiinheseg			16.5	16.5							16.5	
S-67	Busad	Hotiinzah			27.0	27.0							27.0	
SUBTOTAL				-	4) 62.1	4) 62.1							62.1	
TOV														
T-85	Bayanhangai	Buduundugar			6.6	6.6							6.6	
T-86	Argalant	Ehniihudag			1.5	1.5							1.5	
T-87	Erdenesant	Jargalant			4.0	4.0							4.0	
T-88	Bayan	Hunherjinhudag			0.3	0.3							0.3	
T-89	Bayanjargalan	Tarianyhudag			0.5	0.5							0.5	
T-90	Buren	Hoidhudag			0.4	0.4							0.4	
T-91	Undurshireet	Budengiinhudag			1.3	1.3							1.3	
T-92	Sergelen	Tuviinhudag			0.3	0.3							0.3	
SUBTOTAL				-	8) 14.9	8) 14.9							14.9	
ULAANBAATAR														
UL-9	Gachuurt	Uliastaiam		240.0	-	240.0							240.0	
UL-10	Bayanzurh	Holiingol			20.0	20.0							20.0	
UL-11		Uliastai			25.0	25.0							25.0	
UL-12		Angalan			5.0	5.0							5.0	
UL-13		Janjnyclub			3.0	3.0							3.0	
UL-14	Bayangol	Dzuunsalaa			10.0	10.0							10.0	
UL-15	Han-Uul	Turgen			65.0	65.0							65.0	
UL-16		Tuuliintohoi			18.0	18.0							18.0	
UL-17	Songinohairhan	Baruunsalaa			15.0	15.0							15.0	
UL-18	Sukhbaatar	7 buudal			13.0	13.0							13.0	
SUBTOTAL				1) 240.0	9) 174.0	10) 414.0							414.0	
BULGAN														
B-84	RashaanT	Bulag			1) 11.0	1) 11.0							11.0	
ORXHON														
B-85		Hotiin tuv			1) 30.0	1) 30.0							30.0	
TOTAL				1) 240.0	23) 292.0	24) 532.0							532.0	

Note:) shows the number of schemes

A:good, B:mean, C:poor

4.3.5 Farm Management Improvement Plans

The following are districts where typical farm management patterns are assumed to be dominant.

Table 4.3.5.1 Aimag adoptable to Farm Management Patterns

Pattern Name	Selenge & Darkhan-uul	Tov & Ulaanbaatal	Burgan & Orkhon	Ovorhangai
Wheat	A	A	A	B
Vegetables open field	A	A	B	B
Vegetables Greenhouse	A	A		
Fruit	B	B		
Potatoes	A	A	B	B
Wheat + Potatoes	B	B	A	A
Sugarbeet Combined	A	B	B	A
Wheat + Livestock	A	A	B	B

>A< District occupying a large land area

>B< District occupying a medium or small land area

No entry signifies not applicable.

The following are the forms necessary for a farm management trial calculation by farm pattern.

1 Outling of Model Farm management Plan by Farming Type

2 Plan of Crop planting and production by Farm Management Type

3 Mechanization and Cropping Work System by Crop

4 Plan of Farm Machinery and Equipment

5 Labor allotment plan

6 Farming system by crops

7 Agricultural input plan
8 Building and Facilities Improvement plan
9 Balance of Farm Management Account
10 Fund Procurement plan
Reference: Management revenue - expenditure trial calculation
Agricultural Production Materials (Unit prices used for farm management planning)

Table 4.3.5.2 Outline of Model Farm Management Plan by Farming Type

Farm Management Type / Planned		Wheat Company non-irrg.	Vegetables 1 open field	Vegetables 2 green house	Fruits irrgated	Potato non-irrg.	Multiple Wheat+Potato non-irrg.	Wheat Small Farm non-irrg.
Number of Households		40	70	80	20	65	60	8
Number of Farm Worker		3,150	8,230	24,660	2,800	2,580	2,550	630
Area of Arable Land	Planted	2,500	140	3	50	300	1,320	500
	Fallow	2,500				300	1,320	500
	Other			3	20			
	Total	5,000	140	6	70	600	2,640	1,000
Planted Area by crop		Wheat-2,500	Cabbage-70	Tomato-1.5	Chatturga-20	Potato-300	Wheat-1,200	Wheat-500
			Onion- 30	Cucumber-1.5	Other- 30		Potato-120	
			Turnip- 18					
			Carrot- 17					
			Garlic- 5					
Number of Main Agricultural Implements on Farm	Tractor	14	3	3	1	12	10	2
	Combine	10				12	12	2
	Seeder	14	3			6	12	2
	Cultivator	14	2		2	4	14	2
		Thresher 1	Irrigation 3	Smal Truck 3	Sprayer 5	Slector] 1	Sprayer 3	
Main Agricultural Facilities and their Scale	Office	Brick12*8m	Brick12*8m	Brick12*8m	Brick12*8m	Brick12*8m	Brick12*8m	Brick 8*6m
	Garage	Brick24*16m	Brick16*12m	Brick16*3 m	Brick24*16m	Brick16*12m	Brick24*12m	Brick24*10m
	Storage	Wood 8*6m	Brick24*18m			Brick24*18m	Brick24*18m	
				Green House	Windbreak fo			
				30,000m2	rest 5,000m			
Agricultural Gross Income (Thousand Tg)		170,000	92,150	26,700	56,400	198,000	160,800	34,000
Expenditures (Thousand Tg)		160,100	58,760	25,170	44,920	134,580	138,070	33,300
Profit (Thousand Tg)		9,900	33,390	1,530	11,480	63,420	22,730	700

Table 4. 3. 5. 3 Wheat Management

② Plan of Crop Planting and Production by Farm Management Type

Farming Type No. I Wheat

Crops	Planted Area (ha)	Planted Rate (%)	Unit Yield (t/ha)	Production (t)	Remark
Wheat	2500	50.0	1.7	4250.0	
(Seed use field)	(370)	7.4	1.7	(629.0)	
fallow	2500	50.0			
Total	5000	100.0		4250.0	

③ Mechanization and Cropping Work System by Crop

Farming Type No.	wheat	Crop Name	wheat				
Kind of Cropping Works	Period of Work	Agricultural Inputs	Operated Machines Working Methods	No. of Workers	Machine Operated Hours	Labouring Hours	Remark
wheat							
Seeding Fertilizer	5-20/V	Fertilizers250 Fuel25Seed500t	CZN-2.1 Seeder	40	2,400 (0.960)	4,800 (1.920)	
Weed Comtrol	5-15/VI	NaCl 3.75t Fuel 25t	OBT-1A Sprayer	20	320 (0.128)	1,600 (0.640)	
Hervesting	05-20/IX	Fuel 25t	JATKA Combine	12	960 (0.384)	960 (0.384)	
Sreshing	10-20/IX	fuel 12.5t	JIB Combine	8	640 (0.256)	640 (0.256)	
Creaning	10-20/IX	Electric power	OBP-20 OBC-25 Creaner	20	180 (0.072)	1,280 (0.512)	
Carriage	15-25/IX	Electric power	ZPS-100 Carrier	6	240 (0.096)	480 (0.192)	
Other Works			Tractors Man power	10	360 (0.144)	1,120 (0.448)	
Wheat Total					5,100 (2.04)	10,880 (4.352)	
Fallow							
Plowing	1-10/VI	Fuel 10t	KPSH-3.6	12	960 (0.384)	960 (0.384)	
Plowing	5-15/VII	Fuel 22.5t	KPSH-3.6	20	1,600 (0.640)	1,600 (0.640)	
Plowing	25-5/VIII	Fuel 27.5t	KPSH-3.6	24	1,250 (0.500)	1,560 (0.624)	
Plowing	5-15/VIII	Fuel 10t	BIG-3	8	640 (0.256)	640 (0.256)	
Fallow Total					4,450 (1.78)	4,760 (1.904)	
Total					9,550	15,640	

④ Plan of Farm Machinery and Equipment

Major Implements Owned			Operated Area and Hour of Implements by crop per annum										
Type of Implements	Spec	Price thouTg	Crop	Area Total	Hour	Crop	Area Wheat	Hour	Crop	Area Fallow	Hour	Total Hour of Operate	Number of Required Machinery
MTZ-80 Tractor	80	3000	Total	5000	7370	Wheat	2500	2920	Fallow	2500	4450	7370	14set×3000= 42000Thousand Tg
NIBA-5 Combine	320	8000	Total	2500	1600	Wheat	2500	1600				1600	10set×8000= 8000Thousand Tg
Cultivator KPP-2.2		1200	Total	2500	3810				Fallow	2500	3810	3810	14set×1200= 680Thousand Tg
Creaner ZKKSH-6		800	Total	2500	180	Wheat	2500	180				180	5set×800= 400Thousand Tg
Harrow BIG-3		800	Total	2500	640				Fallow	2500	640	640	4set×800= 320Thousand Tg
Seeder CZC-2.1		1200	Total	2500	2400	Wheat	2500	2400				2400	14set×1200= 1680Thousand Tg
Spriyer OBT-1		1700	Total	2500	320	Wheat	2500	320				320	2set×1700= 340Thousand Tg
Carrier ZPC-100		700	Total	2500	240	Wheat	2500	240				240	3set×700= 210Thousand Tg
Other			Total	2500	360	Wheat	2500	360				360	
				Total	16,920		Wheat	8,200		Fallow	8,900	16,920	168,300 Thousand Tg
			EnceptTractor		9,550			5,100			4,450		
			Agricultural Implements Cost									per year	43,758Thousand Tg (168300*0.26)
												Wheat	31,965Thousand Tg
												Fallow	11,793Thousand Tg

⑤-1 Labour allocation Plan

Farming Type No.	Wheat												
Item	Quantity	JANUARY			FEBRUARY			MARCH			APRIL			Sub-Total
		I	II	III	I	II	III	I	II	III	I	II	III	
Number of Workers (person)										5	3	5	5	18
Working Ability (hours/day)										8	8	8	8	
-do- (days per annum)										10	10	10	10	
-do- (total hours per annum										400	240	400	400	1440
Working Hours (hours) Fallow														
Seeding														
Hervesting														
Weed Comtrol														
Other Works										256 70	128 35	256 70	256 70	896 245
Total Working Hours (hours)										326	163	326	326	1141
Balance of Manpower (hours)										+74	+77	+74	+74	+299
Employed Workers (hours)														

㈤-2 Labour allocation Plan(continue)

Farming Type No.	Wheat

Item	Quantity	MAY			JUNE			JULY			AUGAST			Sub-Total
		I	II	III	I	II	III	I	II	III	I	II	III	
Number of Workers (person)		42	40	20	35	30	15	17	15	17	15			246
Working Ability (hours/day)		8	8	8	8	8	8	8	8	8	8			
-do- (days per annum)		10	10	10	10	10	10	10	10	10	10			
-do- (total hours per annum		3360	3200	1600	2800	2400	1200	1360	1200	1360	1200			19680
Working Hours by Crop (hours) Fallow					960 960	600 600	590 590	750 600	570 520	730 620	560 560			4760 4450
Seeding		1800 900	2000 1000	1000 500										4800 2400
Hervesting														
Weed Comtrol					600 120	1000 200								1600 320
Other Works		404 110												404 110
Total Working Hours (hours)		3214	3000	1500	2640	2400	1180	1350	1090	1350	1120			18844
Balance of Manpower (hours)		146	200	100	160	0	20	10	110	10	80			836
Employed Workers (hours)		0	0	0	0	0	0	0	0	0	0			0

⑤-3 Labour allocation Plan(continue)

Farming Type No.	Wheat															
Item	Quantity	SEPTEMBER			OCTOBER			NOVEMBER			DECEMBER			Sub-Total	Total
		I	II	III	I	II	III	I	II	III	I	II	III		
Number of Workers (person)		16	34	16										66	330
Working Ability (hours/day)		8	8	8											
-do- (days per annum)		10	10	10											
-do- (total hours per annum		1280	2720	1280										5280	26400
Working Hours by Crop (hours) Fallow															4760 4450
Seeding															4800 2400
Hervesting		300 300	1000 1000	300 300										1600 1600	1600 1600
Weed Comtrol															1600 320
Other Works		520 140	560 150	500 135										1580 425	2880 780
Total Working Hours (hours)		1260	2710	1235										5205	25190
Balance of Manpower (hours)		20	10	45										75	1210
Employed Workers (hours)		0	0	0										0	0

⑥ Farming System by Crops

Crop | Wheat

Works / Item	Fallow Plowing	Wheat Seeding	Weed Control	Hervesting	Creaning	Carriage Other	Other Works	Total
Work Period	1-10/VI 5-25/VII 1/10/VII	5-20/V	5-15/VI	5-20/IV	10-20/IX	15-25/IX		
Work Method								
Operating Machines	Machine 4Ploing	Machine Man power	Machine Man power	Machine Man power	Machine Man power	Machine Man power		
Hours/ha								
Manpower	1.904 1.78	1.92 0.96	0.64 0.128	0.64 0.64	0.512 0.072	0.64 0.24		
Machines	1.78	0.96	0.128	0.64	0.72	0.24		
Cost/a Hour								
Manpower (Tg/hour)	120	120	120	120	120	120		
Machines (Tg/hour)	2650	1820 1482	2763 1482	13000	5778	2600 1482		
Agricultural Inputs per ha	Fuel 28*2500	Seed200*2500	Fuel 10*2500	Fuel 15*2500	Electric power 0.168hr	Fuel10*2500	othermaterials	
Kind of Inputs		Fuel10*2500 Fertilizer 80*2500	Weed killer 2*2500					
Quantity (kg/ha)	28	290	12	15		10		
Price (Tg/ha)	4,368	17,560	5,060	2,340		1,560	6,783 1,094(Fallow)	

⑦ Agricultural Inputs Plan

Farming Type No.	Wheat					
Crops	Kind of Works	Kind of Inputs	Specification	Required Volume (/ha)	Cost per ha (Tg)	
Wheat	Plowing	Seed		200kg	12,000	60
	Seeding	Fuel	Light oil	Seeding 10kg	1,560	156
			Compound ferti-	Soil crushing 10Kg	1,560	156
	Fertilizer	Fertilizer	lizer17,17,17%	60kg	3,000	50
			Nitrogenous	20kg	1,000	50
	Weed Comtrol	Weed killer		1.5kg	3,500	2,400
		Fuel	Light oil	10kg	1,560	156
	Hervesting	Fuel	Light oil	10kg	1,560	156
		Fuel	Light oil	5kg	780	156
	Carriage	Fuel	Light oil	10kg	1,560	156
		Electricity		0.168hr	(153)	(910)
		Other Materials			6,783	Electric power
Fallow	Weed Comtrol	Fuel	Light oil	4.0kg	624	156
				9.0kg	1,404	156
				11.0kg	1,716	156
				4.0kg	624	156
		Other			1,094	

⑧ Buildings and Facilities Improvement Plan

Farming Type No.	Wheat					
Facilities	Office	Garage	Thresh	Storege	(Milling)	
Specification	Brick 12×8m	Brick 24×16m	Brick 12×9 m	Wood 8×6m	Brick 8×4m	
Construction Cost(ThousandTg)	16000	24000	18000	10000	(28000)	(96000) 68000
Durable Period (Year)	24 Years	24 Years	24 Years	18 Years	24 Years	
Depriciation (ThousandTg)	4.1% 656.0	4.1% 984.0	4.1% 738.0	5.3% 530.0	4.1% (1148.0)	(4056) 2908
Interest of Capital(ThousandTg)	1280	1920	1440	800	(2240)	(7680) 5440
Maintenance Cost (ThousandTg)	1600	2400	1800	1000	(2800)	(9600) 6800
Taxes, Public Impost etc(ThousandTg)						
Insurance (ThousandTg)	288.0	432.0	324.0	180.0	(504.0)	(1728) 1224
Total Cost (ThousandTg)	3824.0	5736.0	4302.0	2510.0	(6692.0)	(23064) 16,372
Utilized Area (ha)	5000	5000	2500	2500	2500	
Unit Cost (Tg/ha)	765 765	1676 618	1721	1004	(2676.8)	

⑨ Balance of Farm Management Account

Farming Type No.	Whert				
Crop / Index	Whert	Fallow			Total
Unit Yield (t/ha)	1.7	0			1.7
Unit Price (Tg/t)	40,000	0			40,000
Planted Area (ha)	2,500	2,500			2,500
Gross Income (ThousandTg)	170,000	0			170,000
Seed & Seedling Cost (ThousandTg)	30,000	0			30,000
Fertilizer (ThousandTg)	10,000	0			10,000
Agricultural Chemicals (ThousandTg)	8,750	0			8,750
Fuel, Energy etc (ThousandTg)	17,500	11,000			28,500
Building, Facilities(ThousandTg)	12,914	3,458			16,372
Agricultural Implements(ThousandTg)	31,965	11,793			43,758
Labour (ThousandTg)	1,918	1,105			3,023
Other (ThousandTg)	16,957	2,736			19,693
Total Cost (ThousandTg)	130,004	30,092			160,096
Net Income (ThousandTg)	39,996	−30,092			9,904

⑩ Fund Procurement Plan

Farming Type No.	Wheat				
Facilities & Implements	Office	Garage	Thresh	Storege	Milling factory
Specification	Brick 12×8m	Brick 24×16m	Brick 12×9m	Brick 8×6m	Brick 8×4m
Parchase Price (ThousandTg)	16,000	24,000	18,000	10,000	28,000
Own Fund (ThousandTg)	1,600	2,400	1,800	1,000	2,800
Borrowed Money (ThousandTg)	14,400	21,600	16,200	9,000	25,200
Brrowed Organization	Agricultural Bank Wheat Fund	Agricultural Bank Wheat Fund	Agricultural Bank Wheat Fund	Agricultural Bank Wheat Fund	Agricultural Bank Wheat Fund
Kind of Funds	10Year	10Year	10Year	10Year	10Year
Term of a Loan	Long-term	Long-term	Long-term	Long-term	Long-term
Pay Back Period	10Year	10Year	10Year	10Year	10Year
Pay Back Amount per Year(ThousandTg)	1,600	2,400	1,800	1,000	(2,800)

Table 4. 3. 5. 4 Vegetable Managemet(Open field)

② Plan of Crop Planting and Production by Farm Management Type

Farming Type No. | Vegetable

Crops	Planted Area (ha)	Planted Rate (%)	Unit Yield (t/ha)	Production (t)	Remark
Cabbage	70	50.0	45.0	3,150	
Onion	30	21.0	7.0	210	
Turnip	18	11.0	15.0	270	
Carrot	17	11.0	15.0	255	
Garlic	5	7.0	5.0	25	
Total	140	100.0		3,910	

③-1 Mechanization and Cropping Work System by Crop

Farming Type No.	Vegetable 1	Crop Name	Cabbage				
Kind of Cropping Works	Period of Work	Agricultural Inputs	Operated Machines Working Methods	No. of Workers	Machine Operated Hours	Labouring Hours	Remark
Seeding Fertilizer	V/25-VI/10	Seed 38.5kg Fuel 196kg Compound 7t	SKON-4.2	3 5	6 0 (0.857)	1 9 6 0 (28.000)	( )= hr/ha
Weed Comtrol	VI/15-VIII/15	Fuel 847kg	KPN-4.2	3 5	1 6 0 (2.286)	1 3 3 0 0 (190.000)	
Irrigation	VI/15-VIII/15	Fuel 1309kg	CKNB-4	3 5	1 0 4 (1.486)	5 7 1 2 (81.600)	
Hervesting	VIII/20-IX/20			3 5	3 1 6 0 (45.143)	8 4 0 0 (120.000)	
Total					3 4 8 4 (49.772)	2 9 3 7 2 (419.600)	

③-2 Mechanization and Cropping Work System by Crop

Farming Type No.	Vegetable 1	Crop Name	Onion				
Kind of Cropping Works	Period of Work	Agricultural Inputs	Operated Machines Working Methods	No. of Workers	Machine Operated Hours	Labouring Hours	Remark
Seeding Fertilizer	V/10-V/15	Seed 21t Fuel 111kg Compound 3t	CLN-8A KPN-4.2	1 5	2 5 (0.833)	8 2 3 (27.433)	( )= hr/ha
Weed Comtrol	V/20-VIII/15	Fuel 441kg	SKNB-4	1 5	6 7 (2.233)	5 6 0 0 (186.667)	
Irrigation	V/20-VIII/15	Fuel 561kg		1 5	4 5 (1.900)	2 4 0 0 (80.000)	
Hervesting	VIII/20-IX/20			1 5	1 3 2 7 (44.234)	3 5 3 0 (117.667)	
Total					1 4 6 4 (48.800)	1 2 3 5 3 (411.767)	

③-3 Mechanization and Cropping Work System by Crop

Farming Type No.	Vegetable I	Crop Name	Turnip				
Kind of Cropping Works	Period of Work	Agricultural Inputs	Operated Machines Working Methods	No. of Workers	Machine Operated Hours	Labouring Hours	Remark
Seeding Fertilizer	V/10-V/12	Seed 54kg Fuel 50kg Compound1.8t	SKON-4.2	9	15 (0.833)	509 (28.278)	( )= hr/ha
Weed Comtrol	V/15-VIII/15	Fuel 347kg	KPN-4.2	9	42 (2.333)	3478 (193.222)	
Irrigation	V/15-VIII/15	Fuel 326kg	SKNB-4	9	30 (1.667)	1486 (82.556)	
Hervesting	VIII/20-IX/20			9	821 (45.611)	2185 (131.389)	
Total					903 (50.444)	7658 (425.445)	

㉓-4 Mechanization and Cropping Work System by Crop

Farming Type No.	Veagetable 1	Crop Name	Carrot				
Kind of Cropping Works	Period of Work	Agricultural Inputs	Operated Machines Working Methods	No. of Workers	Machine Operated Hours	Labouring Hours	Remark
Seeding Fertilizer	V/10-V/12	Seed 102kg Fuel 48kg Compound1.7t	SKON-4.2	9	16 (0.941)	508 (29.882)	( )= hr/ha
Weed Comtrol	V/15-Ⅷ/15	Fuel 348kg	KPN-4.2	9	41 (2.412)	3478 (204.588)	
Irrigation	V/15-Ⅷ/15	Fuel 327kg	SKNB-4	9	31 (1.824)	1486 (87.412)	
Hervesting	Ⅷ/20-Ⅸ/20			9	822 (48.345)	2185 (128.529)	
Total					910 (53.530)	7657 (450.411)	

◎-5 Mechanization and Cropping Work System by Crop

Farming Type No.	Vegetable 1	Crop Name	Garlic				
Kind of Cropping Works	Period of Work	Agricultural Inputs	Operated Machines Working Methods	No. of Workers	Machine Operated Hours	Labouring Hours	Remark
Seeding Fertilizer	V/10-V/11	Seed 3t Fuel 18kg Compound0.5t	SLN-8A	2	4 (0.8)	120 (24.0)	( )= hr/ha
Weed Comtrol	V/20-VIII/15	Fuel 75kg Compound0.4t	KPN-4.2	2	10 (2.0)	800 (160.0)	
Irrigation	V/20-VIII/15	Fuel 95kg	SKNB-4	2	6 (1.2)	340 (68.0)	
Hervesting	VIII/20-IX/20			2	190 (38.0)	500 (100.0)	
Total					210 (42.0)	1760 (352.0)	

④.Plan of Farm Machinery and Equipment

Major Implements Owned			Operated Area and Hour of Implements by crop per annum										
Type of Implements	Spec	Price thouTg	Crop	Area	Hour	Crop	Area	Hour	Crop	Area	Hour	Total Hour of Operate	Number of Required Machinery
			Vegetable			Other							
Tractor MTZ-80	8 0	3000	all Vegetabl	140	6976							6976	3set×3000 =9000Thousand Tg
Broadcaste SKON-4.2		1200	Cabbage Tur,Carr	105	90							90	2set×1200 =2400Thousand Tg
Broadcaste SLN-8A		1200	Onion Garlic	35	30							30	1set×1200 =1200Thousand Tg
Cultivator KRN-4		800	all Vegetabl	140	320							320	2set×800 =160 Thousand Tg
Irrigation Facility		70000											1set×70000= 70000Thousand Tg
Irrigation SKNB-4		700	all Vegetabl	140	216							216	3set×700 =2100Thousand Tg
Other					6320	all Vegeta	140	51824				58144	
Total					6976	ble		51824				58800	86300Thousand Tg

Agricultural Implements Cost	Depric-iation①	Interest ②	Repair ③	Other ④	Total⑤ =①～④	Price ⑥	Cost per year ⑦=⑤*⑥
Agricultural Implements	11.25	8.0	5.0	1.75	26.0 %	14,200 thousandTg	3,692 thousandTg
Irrigation Facility	2.50	8.0	5.0	1.50	17.0	70,000	11,900
Irrigation Pump	4.50	8.0	5.0	2.50	20.0	2,100	420
Total						86,300	16,012

Agricultural Implements Cost for the Vegetable	Cabbage	Onion	Turnip	Carrot	Garlic	Total
Cost per year (thousandTg)	7,997	3,360	2,084	2,089	482	16,012
Machine Operated Hours (hr)	3,484	1,464	908	910	210	6,976

⑤-1 Labour allocation Plan(continue)

Farming Type No.	Vegetable 1													
Item	Quantity	MAY			JUNE			JULY			AUGAST			Sub-Total
		I	II	III	I	II	III	I	II	III	I	II	III	
Number of Workers (person)							60	70	70	70	70	70	70	480
Working Ability (hours/day)							8	8	8	8	8	8	8	
-do- (days per annum)							10	10	10	10	10	10	10	
-do- (total hours per annum							4800	5600	5600	5600	5600	5600	5600	38400
Working Hours by Crop (hours)														
Seeding							1960	1960						3920
Weed Control								4443	4443	4443	4443	4443	4441	26656
Irrigation							2856	2856	1904	1904	952	952		11424
Hervesting													4200	4200
Total Working Hours (hours)							4816	9259	6347	6347	5395	5395	8641	46200
Balance of Manpower (hours)							-16	-3659	-747	-747	+205	+205	-3041	-7800
Employed Workers (hours)							16	3659	747	747			3041	8210

⑤-2 Labour allocation Plan(continue)

Farming Type No.	Vegetable 1														
Item	Quantity	SEPTEMBER			OCTOBER			NOVEMBER			DECEMBER			Sub-Total	Total
		I	II	III	I	II	III	I	II	III	I	II	III		
Number of Workers (person)		70	70	70										210	690
Working Ability (hours/day)		8	8	8											
-do- (days per annum)		10	10	10											
-do- (total hours per annum		5600	5600	5600										16800	55200
Working Hours by Crop (hours)															
Seeding															3920
Weed Control															26656
Irrigation															11424
Hervesting		4200	4200	4200										12600	16800
Total Working Hours (hours)		4200	4200	4200										12600	58800
Balance of Manpower (hours)		+ 1400	+ 1400	+ 1400										+4200	-3600
Employed Workers (hours)		0	0	0											-8210

⑥ Farming System by Crops

Crop	Vegetable 1						
Item \ Works		Seeding	Weed Control	Hervesting	Irrigation	Other	
Work Period		V/25-VI/10	VI/10-VII/1	VII/25-IX/15	VI/25-VII/1		
Work Method		Machine Man Power	Machine	Man Power	Machihe Man Power		
Operating Machines							
Hours/ha							
Manpower		2740			3080		
Machines		0.85	2.28		1.54		
Cost/a Hour							
Manpower (Tg/hour)		2482		8702	2482		
Machines (Tg/hour)		4389	839		1509		
Agricultural Inputs per ha	Cabbage	Seed 0.55kg Fuel 2.8kg			Fuel 18.7kg	Fuel 20kg Chemicals2.4kg	
Kind of Inputs	Onion Turnip Carrot Garlic	700kg 3.7kg 3kg 3.7kg 6kg 2.8kg 600kg 2.8kg	Fuel all Vegetable 3.7kg			21kg, 2.4kg 19kg, 2.9kg 21kg, 2.7kg 22kg, 2.4kg	
Quantity (kg/ha)	Cabbage Onion Turnip Carrot Garlic	3.35kg 703.7kg 5.8kg 8.8kg 602.8kg	Fuel all Vegetable 3.7kg		all Vegetable 18.7		
Price (Tg/ha)	Cabbage Onion Turnip Carrot Garlic	7336 672577 36437 29237 390437	Fuel all Vegetable 3.7kg		all Vegetable 2917		

⑦ Agricultural Inputs Plan

Farming Type No.	Vegetable					
Crops	Kind of Works	Kind of Inputs	Specification	Required Volume (/ha)	Cost per ha (Tg)	Unitcost (Tg)
all Vegetable	Seeding	Seed	Cabbage	0.55kg	6,600	1,200
			Onion	400kg	120,000	300
			Turnip	3kg	36,000	12,000
			Carrot	6kg	28,800	4,800
			Garlic	650kg	390,000	600
		Fertilizer	Nitrogenous	Nitrogenous 20kg	1,000	50
			Compound(17,17,17%)	Compound 80kg	4,000	50
	Weed Control Pest Control	Weed Killer Fungicide		Cabbage 2.4kg	2,880	1,200
				Onion 2.9	3,480	
				Turnip 2.7	3,240	
				Carrot 2.4	2,880	
				Garlic 2.4	2,880	
	Machine	Fuel	Light oil	Cabbage 45kg	7,020	156
				Onion 47kg	7,332	
				Turnip 45kg	7,020	
				Carrot 46kg	7,176	
				Garlic 47.5kg	7,410	
	Other Material			Cabbage	61,200	
				Onion	83,300	
				Turnip	67,100	
				Carrot	69,000	
				Garlic	126,200	

⑧ Buildings and Facilities Improvement Plan

Farming Type No.	Vegetable 1					
Facilities	Office	Garage	Storege			Total
Specification	Brick 12×8m	Brick 16×12m	Brick 24×18m			
Construction Cost (Thousand Tg)	16000	18000	32000			66000.0
Durable Period (years)	24	24	24			
Depriciation (Thousand Tg)	4.1% 656.0	4.1% 738.0	4.1% 1312.0			2706.0
Interest of Capital (Thousand Tg)	1280.0	1440.0	2560.0			5280.0
Maintenance Cost (Thousand Tg)	1600.0	1800.0	3200.0			6600.0
Taxes, Public Impost etc(Thousand Tg)						
Insurance (Thousand Tg)	288.0	324.0	576.0			1188.0
Total Cost (Thousand Tg)	3824.0	4302.0	7468.0			15774.0
Utilized Area (ha)	140	140	140			
Unit Cost (Tg/ha)	27314	30728	54628			112,670

◎ Balance of Farm Management Account

Farming Type No.	Vegetable 1					
Index \ Crop	Cabbage	Onion	Turnip	Carrot	Garlic	Total
Unit Yield (t/ha)	45	7	15	15	5	
Unit Price (Tg/t)	15,000	100,000	36,000	36,000	20,000	
Planted Area (ha)	70	30	18	17	5	140
Gross Income (Thousand Tg)	47,250	21,000	9,720	9,180	5,000	92,150
Seed & Seedling Cost (Thousand Tg)	462	3,600	648	490	1,950	7,150
Fertilizer (Thousand Tg)	350	150	90	85	25	700
Agricultural Chemicals (Thousand Tg)	203	105	58	49	14	429
Fuel, Energy etc (Thousand Tg)	497	219	128	122	37	1,003
Building, Facilities (Thousand Tg)	7,966	3,399	2,000	2,001	411	15,777
Agricultural Implements (Thousand Tg)	7,997	3,360	2,084	2,089	482	16,012
Labour (Thousand Tg)	3,941	1,659	1,028	1,029	237	7,894
Other (Thousand Tg)	4,283	2,498	1,207	1,173	631	9,792
Total Cost (Thousand Tg)	25,699	14,990	7,243	7,038	3,787	58,757
Net Income (Thousand Tg)	25,551	6,010	2,477	2,142	1,213	33,393

⑩ Fund Procurement Plan

Farming Type No.	Vegetable				
Facilities & Implements	Office	Garage	Storage		Total
Specification	Brick 12×8m	Brick 16×12m	Brick 24×18m		
Parchase Price (Thousand Tg)	16000	18000	32000		66000
Own Fund (Thousand Tg)	1600	1800	3200		6600
Borrowed Money (Thousand Tg)	14600	16200	28800		5960
Brrowed Organization	Agricultural Bank	Agricultural Bank	Agricultural Bank		
Kind of Funds	Wheat Fund	Wheat Fund	Wheat Fund		
Term of a Loan	Long term	Long term	Long term		
Pay Back Period (years)	10	10	10		
Pay Back Amount per Year	1600	1800	3200		6600