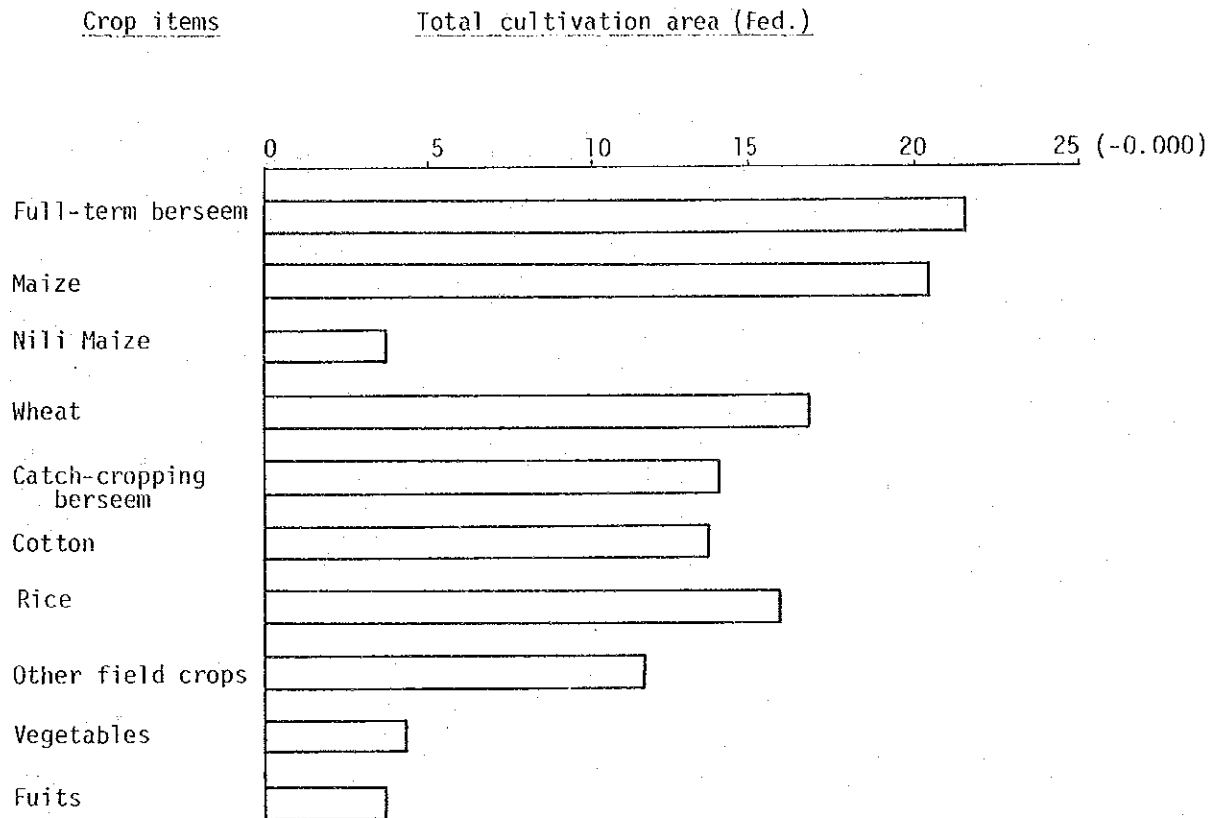


Appendix D

Agriculture

Appendix D-1-1

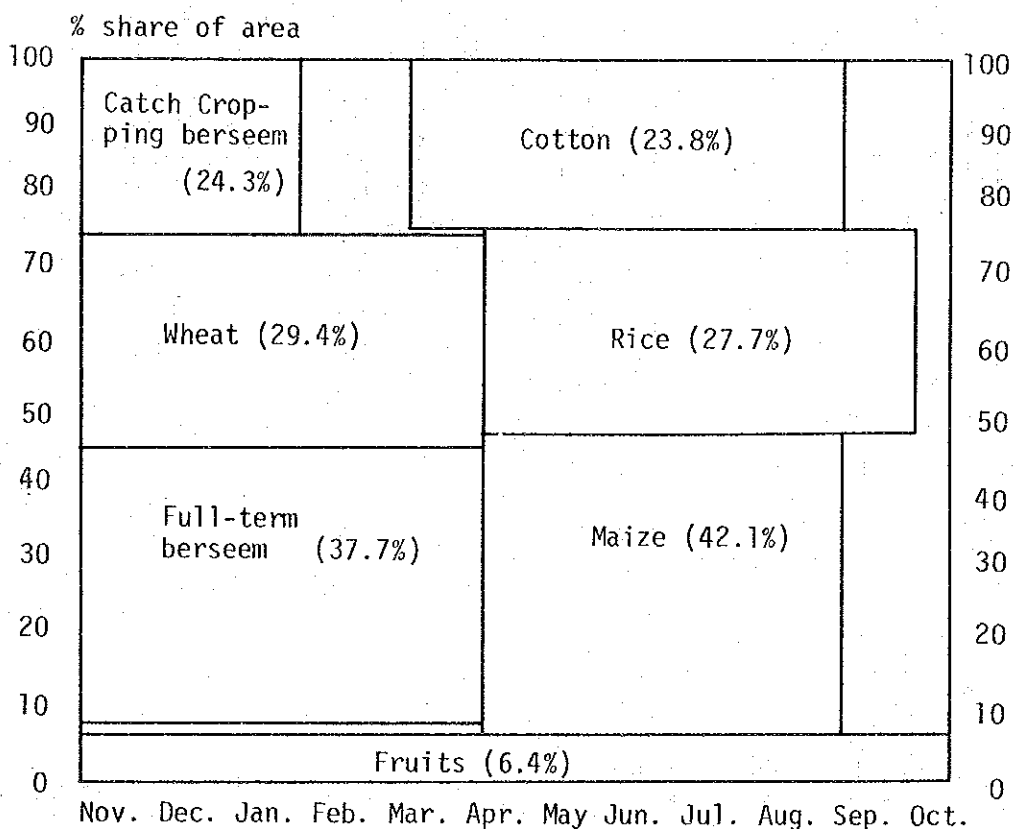
Total Cultivation Area by Crops in the Sharkia Governorate  
in 1979



Data Source: Computed based upon data from Department of Statistics,  
Ministry of Agriculture

Appendix D-1-1

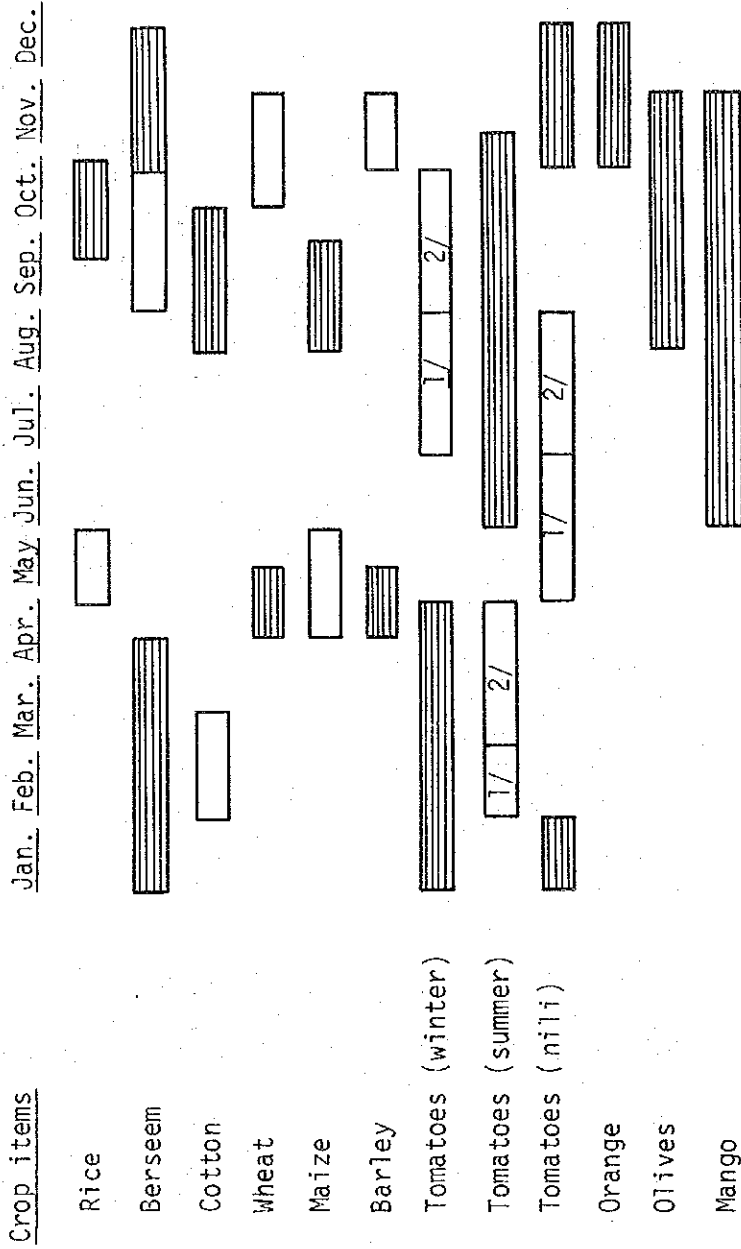
Percentage Share of Cultivation Area for Specific Crops in the Sharkia Governorate in 1979



Data Source: Computed based upon data from Ministry of Land Reclamation

Note : Area for vegetables and other field crops is neglected

Appendix D-1-1 Cropping Schedule for Some Main Crops in the Delta Area



Legend  Planting  Harvesting

Notes: 1/ Planting in nursery  
2/ Transplanting

Data Source: Ministry of Land Reclamation

Appendix D-1-2

Present Conditions of Labour Requirements for Rice  
in San El Hagar

Unit : man-days/feddan

<u>Farming operation items</u>	<u>Skilled man</u>	<u>Unskilled man</u>
Land preparation	3	
Irrigation	12	
Puddling	2	
Seeding	1	2
Weeding	1	40
Fertilization	1	
Harvesting	10	7
Transporting		4
<u>Total</u>	30	53

Data Source : Ministry of Land Reclamation (San El Hagar office)

Appendix D-1-2

Present Conditions of Labour Requirements for  
Berseem<sup>1/</sup> in San El Hagar

Unit : man-days/feddan

<u>Farming operation items</u>	<u>skilled man</u>
Land preparation	3
Seeding	1
Land levelling	1
Irrigation	3
Fertilization	1
Insects control	1
<u>Total</u>	10

Data Source : Ministry of Land Reclamation (San El Hagar office)

Note : 1/ Full-term cropping

Appendix D-1-2

Present Conditions of Labour Requirements for  
Cotton in San El Hagar

Unit : man-days/feddan

<u>Farming operation items</u>	<u>Skilled man</u>	<u>Unskilled man</u>
Land preparation	8	
Irrigation	7	
Seeding		4
Thinning		4
Weeding	20	7
Fertilization	1	4
Insects control	7	45
Harvesting	11	37
<u>Total</u>	54	101

Data Source : Ministry of Land Reclamation (San El Hagar office)

Appendix D-1-2

Present Conditions of Labour Requirements for  
Wheat in San El Hagar

Unit : man-days/feddan

<u>Farming operation items</u>	<u>Skilled man</u>	<u>Unskilled man</u>
Land preparation	3	
Irrigation	3	
Seeding	1	
Fertilization		2
Harvesting & transporting	12	4
<u>Total</u>	19	6

Data Source : Ministry of Land Reclamation (San El Hagar office)



Appendix D-1-2

Present Conditions of Labour Requirements for  
Maize in San El Hagar

Unit : man-days/feddan

<u>Farming operation items</u>	<u>Skilled man</u>	<u>Unskilled man</u>
Land preparation	7	
Seeding	1	5
Thinning		2
Weeding	8	2
Fertilization	4	
Irrigation	5	
Insects control	3	
Harvesting & transporting	5	
Husking	2	6
<u>Total</u>	35	15

Data Source : Ministry of Land Reclamation (San El Hagar office)

Appendix D-1-3

Maximum Fertilization Level for Main Crops as Fixed by the Government  
in 1980

Crop	unit : kg/feddan	
	Calcium Nitrate (N:15.5%) Equivalent	Superphosphate (P <sub>2</sub> O <sub>5</sub> :15%) Equivalent
Rice	200 <sup>1/</sup>	100
Cotton	350 <sup>1/</sup>	100
Wheat	325 <sup>1/</sup>	50
Berseem	0	100
Maize	400 <sup>1/</sup>	-
Barley	300 <sup>1/</sup>	-
Sugarcane	400	100
Tomato	600	150
Potato	600	150
Eggplant	600	-
Garlic (nursery)	450	-
Garlic (fields)	300 <sup>1/</sup>	-
Sesame	200 <sup>1/</sup>	100
Groundnuts	100 <sup>1/</sup>	100
Green pepper	600	150
Watermelon	300	150
Melon	300 <sup>1/</sup>	150
Onion <sup>3/</sup>	200 <sup>1/</sup>	100
Onion <sup>4/</sup>	400 <sup>1/</sup>	100
Elephant grass	1100 <sup>2/</sup>	200
Beans	50	150
Lentils	50	100
Fenugreek	50	100
Lupine	50	100
Flax	300	100
Alfalfa	50	300
Most of vegetables	300	-

Data Source : The Principal Bank for Development and Agricultural Credit

Notes : 1/ Level fixed especially for the Sharkia Governorate    2/ Annual application level  
3/ Single-row cropping    4/ Double-row cropping

Appendix D-1-4

Seeding Level for Main Crops Recommended by  
the Government

Unit : kg/feddan

<u>Crop</u>	<u>Quantity of Seeds required per feddan</u>
Wheat	75
Barley	60
Beans	60
Lentils	20
Berseem	25
Flax	65
Alfalfa	10
Lupine	35
Cotton	60
Maize	20
Sorghum	12
Rice	60
Groundnuts	40
Cow pea	25
Soybean	35
Sunflower	10
Sesame	2
Sugarcane	5000

Data Source : Ministry of Land Reclamation

Appendix D-1-5 Appropriate Amount of Chemicals for Plant Protection Applied per Feddan

<u>Categories</u>	<u>Chemical names</u>	<u>Amount per fed.</u>	<u>Protected crops</u>
<u>Insecticides</u>	Aldrin (50%)	1.5 kg	Cotton
	Sumecedene (20%)	0.6 L	Cotton
	Sumetheone (50%)	0.5 L	Rice
	Lannate (90%)	0.3 kg	Berseem
	Andar	0.25 L	Wheat
	DDT (50%)	3.0 kg	Maize
	Sevin (85%)	2.0 kg	Maize
	Corbex (25%)	0.95 L	Cotton
	Saturn (50%)	2.0 L	Rice
	Gesaprim (80%)	0.75 kg	Maize
<u>Fungicide</u>	Captan <sup>1/</sup> (75%)	0.5 kg	Cotton

Data Source : Ministry of Land Reclamation

Note : 1/ Disinfectant for seeds

Appendix D-1-6 Production of Main Crops in Egypt

(Unit: tons)

Crop	1975	1976	1977	1978	1979
Rice	2,423,446	2,300,032	2,272,309	2,350,675	2,510,754
Wheat	2,033,265	1,959,995	1,697,395	1,933,073	1,856,375
Barley	118,169	123,197	111,372	131,810	121,554
Fenugreek	23,979	19,781	13,940	15,780	22,126
Beans	233,735	254,482	269,697	231,223	235,801
Lentils	39,216	37,998	24,067	15,723	9,113
Chickpeas	4,317	6,170	9,830	9,734	9,480
Linseed	26,784	24,180	29,556	31,134	34,476
Cotton seed	662,227	678,709	690,332	735,745	-
Garlic 1)	84,131	90,306	117,462	100,518	105,751
Garlic 2)	42,854	54,966	88,667	54,648	55,420
Groundnuts	27,655	28,407	30,034	25,518	26,922
Sesame	17,326	13,009	17,693	9,213	12,645
Sugarcane	7,902,270	8,445,759	8,378,669	8,296,320	-
Maize	2,780,519	3,046,538	2,724,083	3,117,024	2,938,208
Lupine	5,181	6,616	6,772	4,332	4,748
Soybean	4,808	11,407	26,496	78,828	106,033
Potato	719,825	892,663	1,010,366	772,364	1,018,725
Onion 3)	228,847	239,851	262,732	223,457	156,957
Onion 4)	44,209	82,705	141,002	77,903	84,301
Onion 5)	222,716	218,204	235,342	202,208	214,237
Onion 6)	76,555	111,213	83,994	95,738	104,512
Flax straw	138,805	124,298	155,820	161,907	181,349
Lint cotton	382,119	396,274	398,688	438,346	-
Tomato	2,106,663	2,066,493	1,966,744	2,197,432	2,420,555

Data Source: Department of Statistics, Ministry of Agriculture

- Notes :
- 1) Single cropping
  - 2) Inter-cropping
  - 3) Winter cropping
  - 4) Summer cropping
  - 5) Summer cropping
  - 6) Autumn cropping

Appendix D-1-6 Production of Main Crops in Sharkia Governorate

(Unit: tons)

Crop	1975	1976	1977	1978	1979
Rice	408,773	374,350	331,539	349,461	389,291
Wheat	257,983	257,256	209,890	239,409	226,114
Barley	16,060	18,758	17,359	17,753	17,637
Fenugreek	634	575	461	287	326
Beans	26,126	26,784	25,482	17,668	16,384
Lentils	3,68	1,76	3,20	74,72	14,88
Chickpeas	631	468	527	324	231
Linseed	1,974	2,682	2,956	3,672	3,905
Cotton seed	91,647	84,081	107,110	116,380	126,762
Garlic	6,227	5,639	10,341	11,911	10,507
Groundnuts	5,464	5,792	6,814	5,063	4,520
Sesame	42	33	1,031	31	61
Sugarcane	27,935	27,754	28,606	26,043	-
Maize 1)	340,716	309,713	279,043	346,274	361,118
Maize 2)	45,676	34,988	47,422	49,513	51,462
Lupine	2,157	1,662	1,718	1,047	823
Soybean	35	356	993	2,519	1,153
Potato	4,250	6,400	10,415	10,633	17,775
Onion 3)	1,018	1,677	4,319	2,485	2,173
Onion 4)	2,646	6,957	7,166	5,909	3,099
Onion 5)	50,505	52,646	51,623	48,214	34,989
Flax straw	12,390	16,811	18,965	23,745	22,759
Lint cotton	46,808	42,880	54,055	59,445	64,777
Tomato 6)	64,233	75,490	81,091	78,330	92,155
Tomato 7)	132,698	145,295	127,665	163,200	169,544
Tomato 8)	302,726	309,423	298,329	353,449	363,448

Data Source: Department of Statistics, Ministry of Agriculture

- Notes :
- 1) Summer cropping
  - 2) Nili cropping
  - 3) Winter cropping
  - 4) Summer cropping
  - 5) Summer inter-cropping
  - 6) Winter cropping
  - 7) Summer cropping
  - 8) Nili cropping

Crop	(Unit: feddan)			
	1975	1976	1977	1979
Rice	1,052,688	1,078,437	1,039,647	1,040,094
Wheat	1,393,950	1,395,588	1,207,151	1,391,324
Barley	99,576	103,774	95,208	106,755
Fenugreek	31,954	28,599	20,839	29,692
Beans	245,574	259,638	291,790	249,509
Lentils	58,367	63,584	48,309	22,277
Chickpeas	5,922	8,481	13,688	14,958
Flax	54,464	47,490	58,573	68,525
Cotton	1,345,990	1,247,628	1,423,365	-
Garlic 1)	12,181	12,110	15,340	13,269
Garlic 2)	10,637	13,530	21,906	13,048
Groundnuts	31,790	32,083	36,406	31,005
Sesame	32,650	30,799	40,011	37,120
Sugarcane	218,024	242,482	249,305	-
Maize	1,829,747	1,890,927	1,754,945	1,884,652
Lupine	7,912	9,919	9,607	6,808
Soybean	8,505	16,959	33,128	100,421
Potato	98,428	128,236	152,279	142,169
Berseem 3)	1,688,031	1,710,750	1,969,760	1,740,953
Berseem 4)	1,123,948	1,045,804	1,157,605	1,031,126
Onion 5)	26,634	30,663	36,927	23,180
Onion 6)	6,596	11,974	19,590	11,864
Onion 7)	91,881	81,545	87,528	68,211
Onion 8)	10,964	16,877	12,418	13,267
Tomato	324,782	307,998	293,385	328,561

Data Source: Department of Statistics, Ministry of Agriculture

- Notes :
- 1) Single cropping
  - 2) Inter-cropping
  - 3) Full-term cropping
  - 4) Catch-cropping
  - 5) Winter cropping
  - 6) Summer cropping
  - 7) Summer inter-cropping
  - 8) Autumn cropping

Appendix D-1-6 Cultivation Area of Main Crops in Sharkia Governorate

(Unit: feddan)

Crop	1975	1976	1977	1978	1979
Rice	174,953	183,151	160,396	155,160	159,042
Wheat	162,723	173,309	143,915	163,915	168,971
Barley	12,421	14,105	13,365	13,747	13,926
Fenugreek	1,111	1,022	828	500	559
Beans	24,939	28,801	27,059	18,108	17,473
Lentils	6	3	6	128	27
Chickpeas	966	713	777	442	302
Flax	4,154	5,356	5,988	7,311	7,283
Cotton	137,770	132,208	160,976	142,939	136,941
Garlic	1,041	895	1,646	1,808	1,579
Groundnuts	6,606	6,800	8,137	5,928	5,172
Sesame	175	138	2,345	118	215
Sugarcane	815	744	764	742	-
Maize 1)	206,658	204,113	183,789	199,247	205,112
Maize 2)	33,933	26,017	36,599	35,758	36,839
Lupine	3,432	2,744	2,820	1,678	1,433
Soybean	115	505	1,628	2,456	1,223
Potato	559	763	1,289	1,373	2,066
Berseem 3)	203,367	194,930	198,785	223,844	216,938
Berseem 4)	158,015	141,771	159,405	146,870	139,658
Onion 5)	169	323	899	467	382
Onion 6)	704	1,257	1,359	1,056	555
Onion 7)	26,648	27,123	30,164	24,201	17,754
Tomato 8)	16,479	17,858	17,882	15,957	16,392
Tomato 9)	18,960	19,684	18,022	18,272	18,545
Tomato 10)	15,511	11,671	11,293	13,727	11,826

Data Source: Department of Statistics, Ministry of Agriculture

- Notes :
- 1) Summer cropping
  - 2) Nili cropping
  - 3) Full-term cropping
  - 4) Catch-cropping
  - 5) Winter cropping
  - 6) Summer cropping
  - 7) Summer inter-cropping
  - 8) Winter cropping
  - 9) Summer cropping
  - 10) Nili cropping



Appendix D-1-6 Average Yield of Main Crops in Egypt

(Unit: tons/feddan)

Crop	1975	1976	1977	1978	1979
Rice	2.302	2.133	2.186	2.281	2.414
Wheat	1.459	1.404	1.406	1.400	1.334
Barley	1.187	1.187	1.170	1.158	1.139
Fenugreek	0.750	0.692	0.669	0.737	0.745
Beans	0.952	0.980	0.924	0.968	0.945
Lentils	0.672	0.598	0.498	0.443	0.409
Chickpeas	0.729	0.728	0.718	0.700	0.634
Linseed	0.492	0.509	0.505	0.520	0.503
Cotton seed	0.492	0.544	0.485	0.619	-
Garlic 1)	6.907	7.457	7.655	7.862	7.970
Garlic 2)	4.029	4.063	4.048	4.069	4.247
Groundnuts	0.870	0.885	0.825	0.825	0.868
Sesame	0.531	0.422	0.442	0.395	0.341
Sugarcane	36.245	34.830	33.608	33.508	-
Maize	1.520	1.611	1.543	1.642	1.559
Lupine	0.655	0.667	0.705	0.671	0.697
Soybean	0.565	0.673	0.800	0.965	1.056
Potato	7.314	6.961	6.634	6.051	7.166
Onion 3)	8.592	7.822	7.115	7.657	6.771
Onion 4)	6.702	6.907	7.198	6.868	7.106
Onion 5)	2.424	2.676	2.689	2.880	3.141
Onion 6)	6.982	6.590	6.764	7.058	7.880
Flax straw	2.549	2.617	2.660	2.702	2.646
Lint cotton	0.284	0.318	0.280	0.369	-
Tomato	6.490	6.710	6.700	7.070	7.370

Data Source: Department of Statistics, Ministry of Agriculture

- Notes : 1) Single cropping      4) Summer cropping  
 2) Inter-cropping      5) Summer inter-cropping  
 3) Winter cropping      6) Autumn cropping

Appendix D-1-6 Average Yield of Main Crops in Sharkia Governorate

Crop	(Unit: tons/feddan)			
	1975	1976	1977	1978
Rice	2.336	2.044	2.067	2.252
Wheat	1.586	1.485	1.458	1.467
Barley	1.292	1.330	1.298	1.291
Fenugreek	0.570	0.563	0.556	0.575
Beans	1.052	0.930	0.942	0.977
Lentils	0.600	0.560	0.528	0.584
Chickpeas	0.653	0.657	0.678	0.734
Linseed	0.467	0.500	0.494	0.503
Cotton seed	0.665	0.636	0.665	0.814
Garlic	5.982	6.370	6.283	6.588
Groundnuts	0.827	0.852	0.838	0.854
Sesame	0.239	0.239	0.439	0.263
Sugarcane	34.276	37.304	37.442	35.098
Maize 1)	1.649	1.518	1.518	1.737
Maize 2)	1.348	1.345	1.296	1.187
Lupine	0.629	0.606	0.609	0.624
Soybean	0.301	0.704	0.610	1.026
Potato	7.600	8.390	8.080	7.740
Onion 3)	5.194	5.192	4.804	5.321
Onion 4)	3.759	5.535	5.273	5.596
Onion 5)	1.895	1.941	1.711	1.992
Flax straw	2.983	3.139	3.167	3.243
Lint cotton	0.340	0.324	0.336	0.416
Tomato 6)	3.898	4.227	4.535	4.909
Tomato 7)	6.999	7.381	7.084	8.932
Tomato 8)	6.821	7.595	7.932	8.153

Data Source: Department of Statistics, Ministry of Agriculture

- Notes :
- 1) Summer cropping
  - 2) Nili cropping
  - 3) Winter cropping
  - 4) Summer cropping
  - 5) Summer inter-cropping
  - 6) Winter cropping
  - 7) Summer cropping
  - 8) Nili cropping

Appendix D-1-6 Production of Vegetables in Egypt

(Unit: tons)

Crop	1975	1976	1977	1978	1979
Squash	349,550	377,657	393,426	427,181	454,910
Greenbean	47,804	62,711	82,822	89,516	109,868
Pea	40,281	41,860	43,148	34,047	44,721
Cowpea	6,701	6,876	12,055	4,928	6,202
Egyptian mallow	10,248	10,869	8,307	6,905	8,761
Cabbage	320,656	329,290	339,646	347,844	359,599
Cauliflower	69,736	82,575	86,510	85,227	97,341
Eggplant	217,267	229,736	239,464	278,880	312,187
Pepper	125,642	138,233	123,225	155,946	175,329
Okra	63,396	60,416	64,562	64,531	68,541
Jewish mallow	60,485	60,064	72,792	69,192	85,644
Spinach	28,257	31,545	33,566	36,444	41,661
Taro	62,983	77,025	72,471	82,952	98,968
Radish	26,271	24,092	22,334	28,973	30,388
Turnip	46,019	45,865	42,266	51,826	59,373
Lettuce	67,789	86,223	93,612	105,151	127,869
Carrot	89,594	94,962	88,391	108,132	135,773
Parsley	19,257	22,200	16,755	18,891	34,810
Rocket	27,550	26,320	27,877	40,392	45,161
Egyptian leek	23,519	20,933	20,060	27,260	35,539
Watermelon	1,212,096	1,361,919	1,186,826	1,311,884	1,219,307
Melon	170,911	150,366	130,763	141,451	179,374
Cucumber	225,730	224,351	215,450	231,125	272,283

Data Source: Department of Statistics, Ministry of Agriculture

## Appendix D-1-6 Production of Vegetables in Sharkia Governorate

(Unit: tons)

Crop	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Squash	67,054	74,921	93,345	84,566	95,172
Green bean	1,950	2,141	2,097	2,483	2,709
Pea	5,457	7,163	7,843	4,230	7,812
Cow pea	575	579	-	443	587
Egyptian mallow	4,540	4,770	3,841	2,933	4,871
Cabbage	37,113	40,580	57,825	44,276	50,923
Cauliflower	6,027	11,004	12,569	8,145	14,913
Eggplant	24,824	27,783	25,178	23,347	21,641
Pepper	16,142	16,919	12,143	10,988	13,161
Okra	6,544	8,086	5,262	7,725	6,324
Jewish mallow	2,607	3,339	1,834	2,153	2,727
Spinach	1,785	3,222	3,509	1,730	3,190
Taro	34,580	44,752	42,942	47,130	55,868
Radish	2,281	2,024	2,249	2,814	3,168
Turnip	1,946	2,419	2,124	1,193	2,663
Lettuce	6,677	12,898	12,144	11,035	13,381
Carrot	2,748	4,495	4,959	4,029	6,044
Parsley	3,047	3,258	2,197	2,871	3,997
Rocket	3,439	3,673	4,004	5,157	5,192
Egyptian leek	4,705	4,030	3,752	4,363	4,729
Watermelon	46,890	53,998	57,008	26,546	42,452
Melon	1,002	2,189	2,612	1,000	1,466
Cucumber	26,222	27,313	19,599	20,035	31,155

Data Source: Department of Statistics, Ministry of Agriculture

Appendix D-1-6 Cultivation Area of Vegetables in Egypt

(Unit: feddan)

Crop	1975	1976	1977	1978	1979
Squash	46,314	48,876	51,048	55,512	57,046
Green bean	15,480	18,694	23,210	24,980	30,361
Pea	17,579	13,669	13,758	10,771	12,980
Cow pea	8,613	8,806	3,697	6,245	7,900
Egyptian mallow	955	965	724	652	789
Cabbage	33,852	34,000	34,251	34,664	35,375
Cauliflower	7,999	9,254	9,272	8,929	10,056
Eggplant	24,729	25,047	27,655	31,622	34,942
Pepper	18,569	20,201	19,756	23,641	25,320
Okra	10,539	10,451	11,004	10,780	11,364
Jewish mallow	8,643	8,322	9,198	8,967	9,581
Spinach	4,891	5,249	5,357	5,429	6,060
Taro	5,766	7,039	5,665	6,389	7,450
Radish	5,277	4,676	4,445	5,352	5,338
Turnip	6,437	6,164	5,514	6,607	7,588
Lettuce	3,260	9,520	10,643	12,373	14,564
Carrot	11,405	11,223	10,556	11,481	13,670
Parsley	1,887	2,055	1,992	1,692	2,790
Rocket	3,136	2,880	3,309	4,286	4,528
Egyptian leek	2,004	1,763	1,958	2,427	2,780
Watermelon	110,525	122,299	113,864	121,084	124,697
Melon	15,701	14,118	13,568	14,752	18,467
Cucumber	37,087	35,174	35,477	36,327	40,427

Data Source: Department of Statistics, Ministry of Agriculture

Appendix D-1-6 Cultivation Area of Vegetables in Sharkia Governorate

(Unit: feddan)

Crop	1975	1976	1977	1978	1979
Squash	8,144	9,066	11,498	10,050	11,911
Green bean	561	557	594	677	711
Pea	1,416	1,944	2,062	1,096	1,910
Cow pea	594	603	799	489	649
Egyptian mallow	347	347	280	227	352
Cabbage	3,583	3,763	5,227	3,854	4,403
Cauliflower	618	1,040	1,148	743	1,332
Eggplant	2,071	2,222	2,088	2,107	1,739
Pepper	1,958	2,040	1,734	1,570	1,761
Okra	1,063	1,311	938	1,225	965
Jewish mallow	314	389	243	271	348
Spinach	376	682	705	311	587
Taro	2,892	3,768	2,739	2,955	3,610
Radish	700	561	641	647	673
Turnip	270	347	276	153	349
Lettuce	776	1,269	1,164	1,050	1,364
Carrot	307	455	486	377	614
Parsley	252	251	222	223	328
Rocket	322	334	377	460	478
Egyptian leek	303	262	284	306	320
Watermelon	5,834	6,064	6,687	2,733	4,039
Melon	131	266	334	116	170
Cucumber	3,655	4,071	3,705	3,137	4,155

Date Source: Department of Statistics, Ministry of Agriculture

## Appendix D-1-6

## Average Yield of Vegetables in Egypt

(Unit: tons/feddan)

<u>Crop</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Squash	7.547	7.727	7.707	7.695	7.974
Green bean	3.088	3.355	3.568	3.584	3.619
Pea	2.291	3.062	3.136	3.161	3.445
Cow pea	0.778	0.781	-	0.789	0.785
Egyptian mallow	10.731	11.263	11.474	10.590	11.104
Cabbage	9.472	9.685	9.916	10.035	10.165
Cauliflower	8.718	8.923	9.330	9.545	9.680
Eggplant	8.786	9.172	8.659	8.819	8.934
Pepper	6.766	6.843	6.237	6.596	6.925
Okra	6.015	5.781	5.867	5.986	6.031
Jewish mallow	6.998	7.217	7.914	7.716	8.939
Spinach	5.777	6.010	6.266	6.713	6.875
Taro	10.923	10.943	12.793	12.984	13.284
Radish	4.978	5.152	5.025	5.413	5.693
Turnip	7.149	7.441	7.665	7.844	7.825
Lettuce	8.207	8.692	8.796	8.498	8.780
Carrot	7.356	8.461	8.374	9.418	9.932
Parsley	10.205	10.803	8.411	11.165	12.477
Rocket	6.785	9.139	8.425	9.424	9.822
Egyptian leek	11.736	11.874	10.245	11.232	12.784
Watermelon	10.967	11.136	10.423	10.834	9.778
Melon	10.885	10.651	9.638	9.589	9.713
Cucumber	6.086	6.378	6.073	6.362	6.735

Data Source: Department of Statistics, Ministry of Agriculture

## Appendix D-1-6

## Average Yield of Vegetables in Sharkia Governorate

Crop	(Unit: tons/feddan)			
	1975	1976	1977	1978
Squash	8.234	8.264	8.118	8.415
Green bean	3.476	3.844	3.530	3.668
Pea	3.854	3.685	3.804	3.859
Cow pea	0.985	0.960	-	0.906
Egyptian mallow	13.084	13.746	13.718	12.921
Cabbage	10.358	10.784	11.063	11.488
Cauliflower	9.572	10.581	10.949	10.962
Eggplant	11.986	12.504	12.058	11.081
Pepper	8.244	8.294	7.003	6.999
Okra	6.156	6.168	5.610	6.306
Jewish mallow	8.303	8.584	7.547	7.945
Spinach	4.747	4.724	4.977	5.563
Taro	11.957	11.877	15.678	15.949
Radish	3.259	3.608	3.509	4.349
Turnip	7.207	6.971	7.696	7.797
Lettuce	8.604	10.164	10.433	10.510
Carrot	8.951	9.879	10.204	10.687
Parsley	12.091	12.980	9.896	12.874
Rocket	10.680	10.997	10.621	11.211
Egyptian leek	15.528	15.382	13.211	14.258
Watermelon	8.037	8.905	8.525	9.713
Melon	7.649	8.229	7.820	8.621
Cucumber	7.174	6.709	5.290	6.387

Data Source: Department of Statistics, Ministry of Agriculture



Appendix D-1-6 Production of Fruits in Egypt

(Unit: tons)

Crop	1975	1976	1977	1978	1979
Citrus	1,013,314	838,750	796,912	989,730	1,216,273
Grapes	225,181	279,430	247,887	273,743	242,303
Mangoes	92,169	83,715	57,198	90,338	115,407
Bananas	111,861	111,786	126,927	113,394	112,552
Figs	15,101	14,258	14,166	13,764	16,209
Guavas	74,636	90,978	82,097	97,834	118,852
Pomegranates	18,149	16,877	6,862	10,776	13,106
Olives	8,303	7,455	5,413	5,168	6,086
Apricots	13,774	11,585	8,930	17,867	14,786
Pears	20,979	26,463	30,322	32,007	50,173
Apples	8,105	9,629	9,487	16,812	17,642
Peaches	10,407	10,169	10,437	11,027	9,798
Plums	1,976	2,334	2,634	4,213	5,086
Dates	415,059	416,958	461,061	376,893	406,056
Almonds	2,471	2,086	2,086	2,483	2,482
Custard apples	-	13	13	86	126
Quinces	167	120	119	-	157
Japanese loquats	-	237	239	168	160
Persimmons	48	43	29	97	139
Pecans	957	1,006	932	1,446	1,436
Avocados	3	-	5	2	2
Jujubes	42	-	2	2	2

Data Source: Department of Statistics, Ministry of Agriculture

Appendix D-1-6 Production of Fruits in Sharkia Governorate

(Unit: tons)

<u>Crop</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Citrus	146,011	134,823	129,010	173,123	188,794
Grapes	2,666	3,059	2,879	1,764	2,148
Mangoes	33,444	23,659	23,578	35,789	25,739
Bananas	10	9	8	-	-
Guavas	1,899	2,228	2,687	2,855	2,723
Apricots	1	-	-	2	2
Pears	28	27	8	36	65
Peaches	360	595	756	112	73
Plums	11	27	29	24	22
Dates	50,900	55,459	58,723	49,256	50,305
Pecans	15	-	-	-	-

Data Source: Department of Statistics, Ministry of Agriculture

Appendix D-1-6 Cultivation Area of Fruits in Egypt

(Unit: feddan)

Crop	1975	1976	1977	1978	1979
Citrus	161,609	178,337	182,610	188,127	189,749
Grapes	42,071	46,276	48,308	50,390	52,459
Mangoes	22,993	25,260	25,429	26,894	27,023
Bananas	11,553	12,287	12,509	13,060	13,678
Figs	7,296	7,315	7,286	7,266	7,137
Guavas	12,500	12,462	12,794	14,007	14,615
Pomegranates	3,233	3,360	3,472	3,473	3,546
Clives	3,568	4,361	4,373	3,302	4,024
Apricots	4,603	4,746	4,788	4,825	4,872
Pears	5,832	6,810	7,683	7,906	8,749
Apples	3,696	4,407	4,695	4,855	5,017
Peaches	1,932	1,840	1,931	2,114	2,230
Plums	1,380	1,912	2,278	2,713	2,989
Dates	-	34,896	-	33,014	-
Almonds	-	531	531	1,021	1,245
Custard apples	-	28	37	21	21
Quinces	26	25	25	-	25
Japanese loquats	-	51	56	49	45
Persimmons	17	35	35	32	42
Pears	580	589	561	572	567
Avocados	2	-	3	8	8
Jujubes	8	-	3	5	5

Data Source: Department of Statistics, Ministry of Agriculture

Appendix D-1-6 Cultivation Area of Fruits in Sharkia Governorate

(Unit: feddan)

Crop	1975	1976	1977	1978	1979
Citrus	25,072	27,374	27,526	27,956	27,902
Grapes	484	580	585	507	512
Mangoes	6,869	6,949	6,899	7,641	7,633
Bananas	1	1	1	-	-
Guavas	460	524	542	634	625
Apricots	2	4	-	2	2
Pears	18	15	22	87	93
Apples	-	-	4	7	33
Peaches	76	64	54	25	23
Plums	21	20	20	22	22
Dates	-	2,074	-	2,196	-
Japanese loquats	-	-	-	2	2
Pecans	13	-	-	4	4

Data Source: Department of Statistics, Ministry of Agriculture

Appendix D-1-7 Number of Livestock in Egypt

(000. Heads)

<u>Livestock items</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Cows	2127	2119	2102	2079	2048	2587
Buffaloes	2135	2170	2204	2236	2266	2542
Sheep	1994	1965	1926	1878	1821	2554
Goats	1264	1293	1321	1349	1375	1440
Camels	113	109	105	101	97	93
Pigs	14	15	15	15	15	15

Data Source : Central Agency for Public Mobilization & Statistics

Appendix D-1-7. Number of Poultry in Egypt

(000.)

<u>Poultry items</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Local chickens	25458	25764	26069	26375	26680	26986
Turkeys	678	687	696	705	715	724
Ducks	3148	3197	3246	3294	3343	3392
Geese	2565	2589	2613	2637	2661	2685
Pigeons (Pairs)	1762	1569	1551	1440	1325	1207
Rabbits	2072	2063	2053	2043	2032	2020

Data Source : Central Agency for Public Mobilization & Statistics

Appendix D-1-8 Governmental Purchasing Price of  
Some Main Agricultural Products

<u>Product items</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Rice <u>1/</u>	32.00	40.00	50.00	50.00	65.00	65.00	-
Wheat (Indian Varieties) <u>2/</u>	6.25	7.00	7.00	7.00	7.00	9.50	11.50
Wheat (Mexican Varieties) <u>2/</u>	6.50	8.00	8.00	8.00	8.00	10.50	12.50
Beans <u>2/</u>	9.00	13.00	13.00	15.00	15.00	20.00	25.00
Lentils <u>2/</u>	17.00	17.00	22.00	22.00	22.00	35.00	40.00
Sesame <u>2/</u>	19.00	22.00	25.00	25.00	25.00	50.00	65.00
Sugarcane <u>3/</u>	6.00	7.00	8.00	8.00	9.00	9.50	12.50
Groundnuts <u>2/</u>	7.50	10.00	11.00	11.00	18.00	18.00	-
Onion <u>1/</u>	22.00	27.00	33.00	38.00	38.00	43.00	-
Seed cotton <u>3/</u>	-	23.92	33.36	35.74	36.24	48.45	-

Data Source : Department of Statistics, Ministry of Agriculture

Notes : 1/ Price : L.E./ton  
2/ Price : L.E./ardeb  
3/ Price : L.E./kantar

Appendix D-1-9 Average Farmgate Price of Main Crops  
for Private Sectors in Egypt

<u>Product items</u>	<u>Price Unit</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Rice	L.E./ton	40.24	50.00	-	66.10	65.89
Wheat	L.E./ardeb	7.70	7.07	8.12	9.25	9.60
Barley	L.E./ardeb	6.55	6.18	7.24	7.69	7.00
Fenugreek	L.E./ardeb	12.70	12.55	17.63	31.97	32.90
Beans	L.E./ardeb	16.14	16.27	16.33	20.85	21.30
Chickpeas	L.E./ardeb	32.29	42.58	38.05	43.33	44.20
Linseed	L.E./ton	133.28	137.40	147.60	187.05	201.60
Garlic	L.E./ton	33.00	35.52	39.05	46.48	82.10
Groundnuts	L.E./ardeb	14.37	13.55	16.84	18.70	20.74
Sesame	L.E./ardeb	22.20	24.77	26.90	42.02	52.57
Sugarcane	L.E./ton	7.53	8.42	8.26	9.34	12.60
Maize	L.E./ardeb	7.12	7.04	10.66	10.00	10.37
Lupine	L.E./ardeb	22.54	25.35	25.96	32.16	43.40
Soybean	L.E./ton	-	-	-	199.50	198.57
Onion <sup>1/</sup>	L.E./ton	24.58	29.16	31.42	32.90	44.56
Onion <sup>2/</sup>	L.E./ton	36.00	37.57	36.05	41.51	60.60
Flax Straw	L.E./ton	16.00	19.38	22.55	33.50	29.80
Berseem	L.E./cutting/feddan	28.80	33.48	42.74	73.26	54.00

Data Source : Department of Statistics, Ministry of Agriculture

Notes : <sup>1/</sup> Winter cropping

<sup>2/</sup> Summer cropping



Appendix D-1-9 Average Farmgate Price of Main Crops for  
Private Sectors in Sharkia Governorate

<u>Product items</u>	<u>Price Unit</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Rice	L.E./ton	40.16	49.79	-	65.00	67.00
Wheat	L.E./ardeb	7.50	7.35	7.93	9.17	10.00
Barley	L.E./ardeb	7.30	6.50	6.50	7.40	7.00
Fenugreek	L.E./ardeb	13.77	13.50	17.64	27.50	30.00
Beans	L.E./ardeb	17.04	17.00	16.77	24.68	20.00
Chickpeas	L.E./ardeb	26.50	-	28.50	45.00	37.00
Linseed	L.E./ton	126.39	137.79	147.60	187.05	180.00
Garlic	L.E./ton	30.00	35.00	35.70	59.80	111.00
Groundnuts	L.E./ardeb	15.49	13.94	18.42	20.42	20.79
Sesame	L.E./ardeb	21.00	-	30.00	37.81	55.96
Maize	L.E./ardeb	7.09	6.81	10.00	9.53	10.87
Lupine	L.E./ardeb	20.00	24.60	26.10	30.00	37.00
Soybean	L.E./ton	-	-	-	200.00	200.00
Onion	L.E./ton	35.00	35.59	35.62	34.80	59.00
Flax straw	L.E./ton	16.90	20.00	20.00	32.00	34.50
Berseem	L.E./cutting/feddan	30.78	22.50	64.26	72.00	54.00

Data Source : Department of Statistics, Ministry of Agriculture

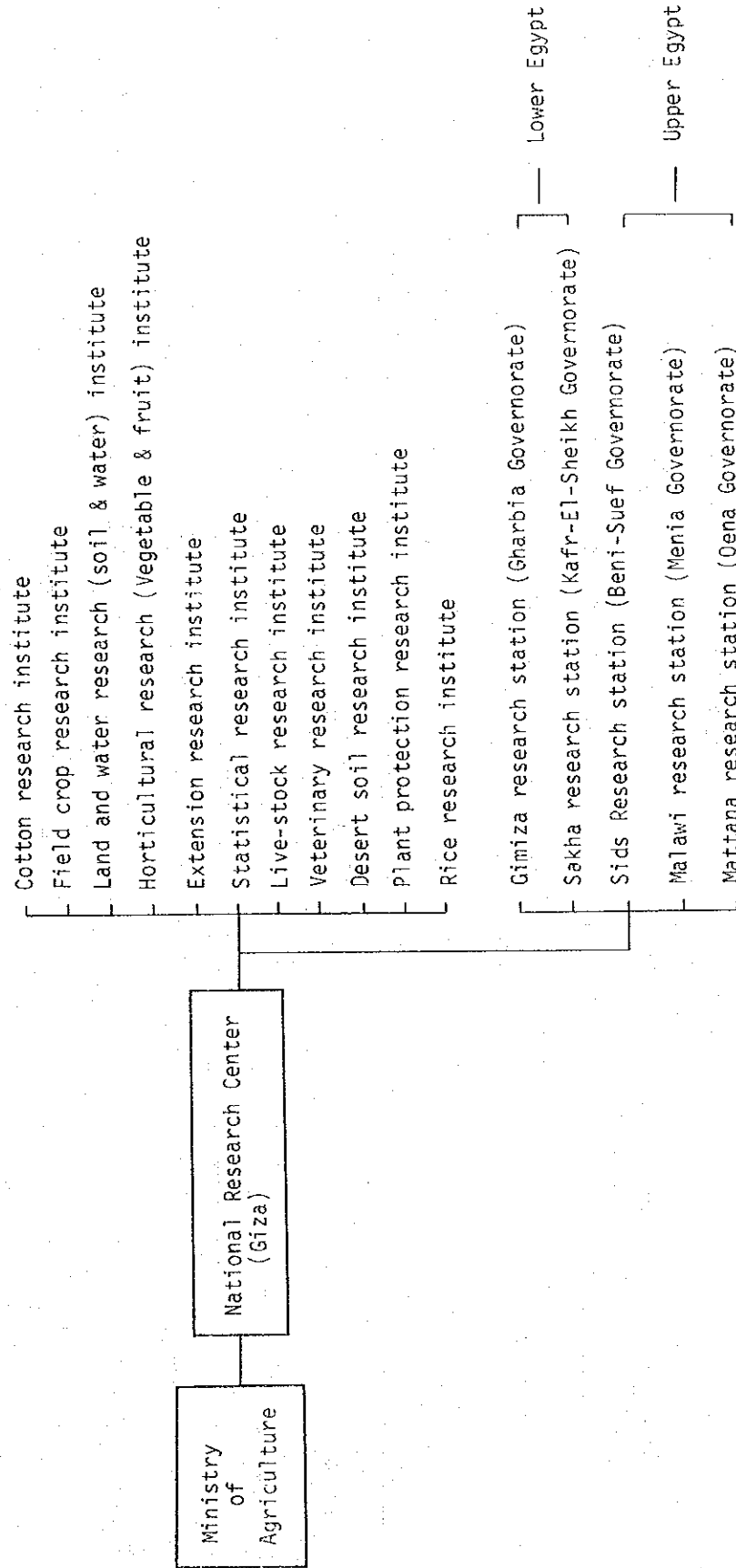
Appendix D-1-10 Average Operation Charges for Seedbed Preparation in 1979

(Unit : L.E./feddan)

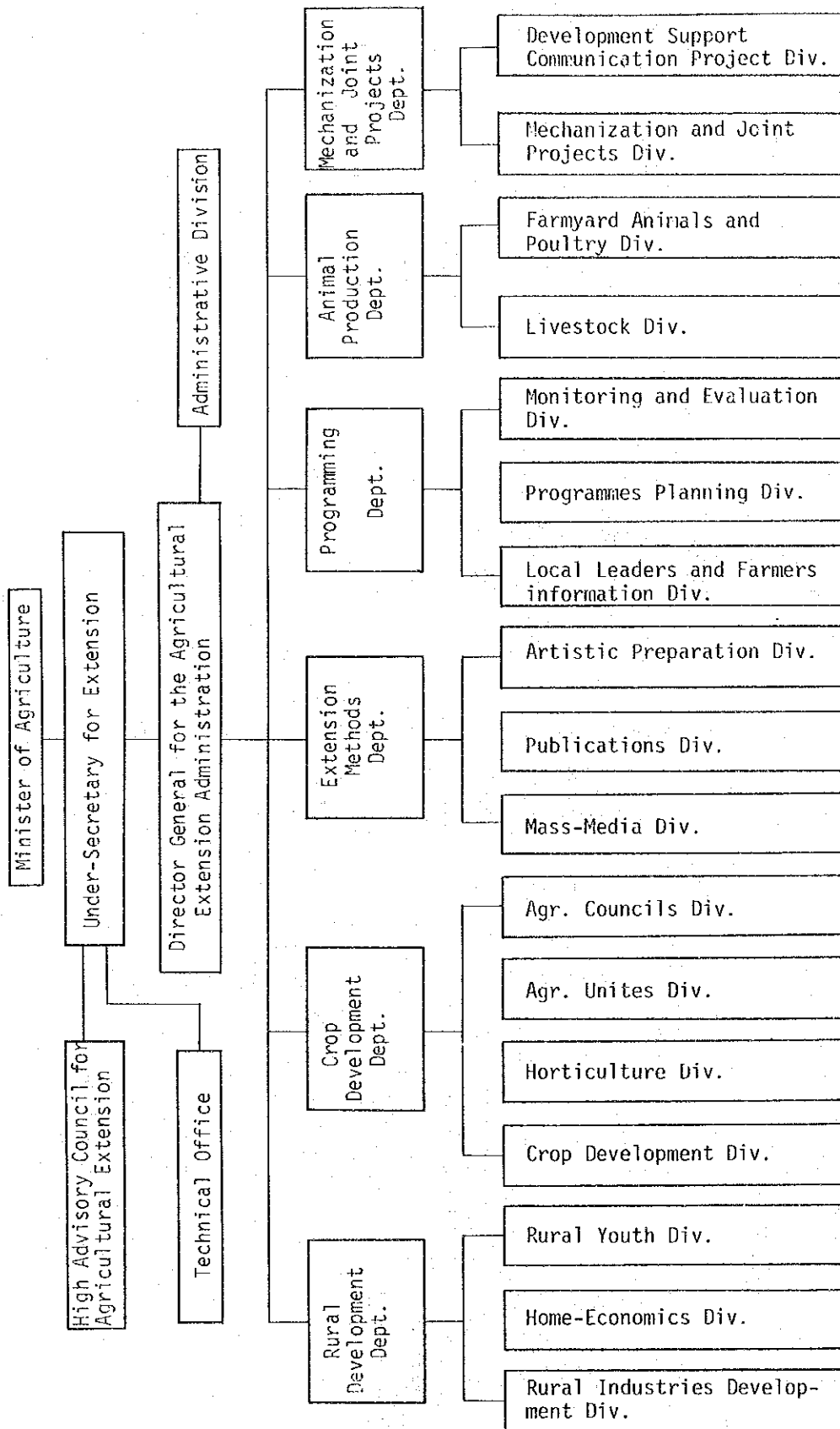
<u>Operation item</u>	<u>Tractor-operated</u>		<u>Animal-operated</u>	
	<u>Cooperative</u>	<u>Private</u>	<u>Cooperative</u>	<u>Private</u>
Primary cultivation	2.75	5.00		8.00
Furrowing	1.00	1.50		2.00
Levelling	0.50	0.75		1.00
Ditching	0.67	0.52		2.10
Others	1.50	0.75		1.70
<u>Total</u>	<u>6.42</u>	<u>8.52</u>		<u>14.80</u>

Data Source : Ministry of Agriculture

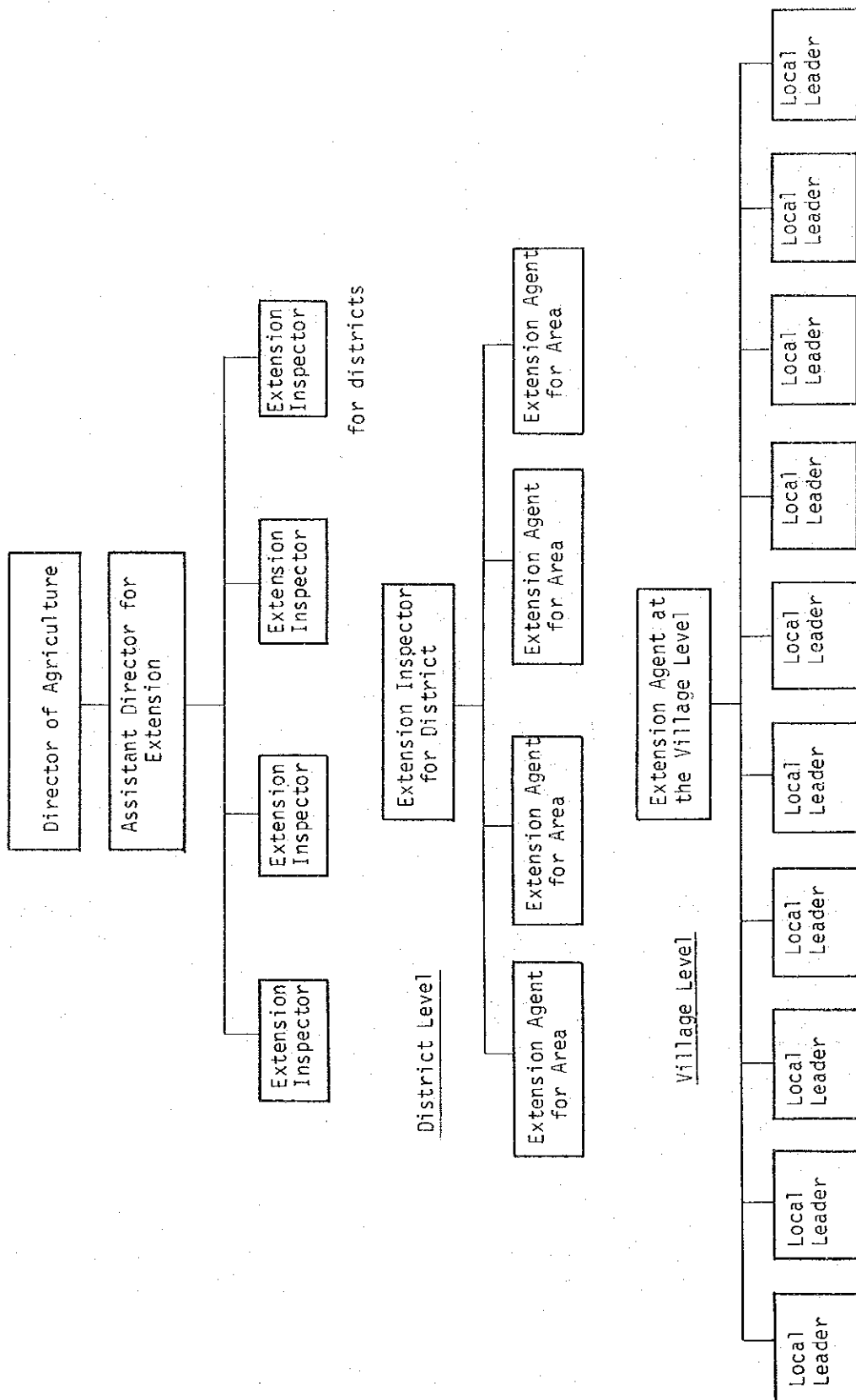
Organization of National Research Center, the Arab Republic of Egypt



Appendix D-1-12 Central Governmental Structure of Agricultural Extension Organization in the Arab Republic of Egypt



Appendix D-1-13 Local Governmental Structure of Agricultural Extension Organization in The Arab Republic of Egypt



## Appendix D-2-1

Projected Domestic Demand for Main  
Agricultural Produce

(Unit : 1,000 tons)

<u>Items</u>	<u>1980</u>	<u>1985</u>
<u>Cereals</u>		
Wheat flour	4,187	4,903
Rice milled	1,348	1,573
Maize	1,298	1,273
Millet flour	593	589
<u>Starchy Roots</u>	579	690
<u>Sugar Products</u>	7,363	8,994
(in cane equiv.)		
<u>Pulses and Seeds</u>		
Dry broad beans	334	382
Other pulses	99	115
Seeds	35	42
<u>Vegetables</u>		
Tomatoes	1,724	2,101
Other Vegetables	2,674	3,173
<u>Fruit</u>		
Citrus fruit	949	1,195
Dates	430	499
Other fruits	1,956	2,322
<u>Meat</u>		
Meat and offals	430	517
Poultry	118	147
<u>Eggs</u>	70	84
<u>Fish</u>	174	217
<u>Milk</u>	1,555	1,924
<u>Fats and Oils</u>		
Animal fats	10	12
Vegetables oils	345	424
<u>NON FOOD DEMAND</u>		
Cotton Textiles	154	183
(in lint equiv.)		

Data Source : Perspective study of agricultural development for the Arab Republic of Egypt, 1973, FAO.

Appendix D-2-2 Farming Operations System for Rice 1/ (A-1)

Operation items	Power source	Implements or machinery	Op. width (m)	Op. speed (km/hr)	Field op. efficiency (%)	Field op. capacity (ha/hr)	Op. times (times)
1) Speed preparation	Manual						1
2) Plowing	Tractor	Bottom plow	1.00	4.5	71	0.320	1
3) Puddling	Tractor	Drive harrow	3.33	4.0	82	1.092	4
4) Pre-germinating	Manual						
5) Seeding	Tractor	Broadcaster	8.00	4.5	60	2.160	1
6) Fertilization 1)	Manual						
7) Fertilization 2)	Manual						
8) Irrigation management	Manual						
9) Weed control 1)	Manual						
10) Weed control 2)	Tractor	Power sprayer	10.00	2.0	31	0.620	2
11) Pest insects control	Tractor	Power sprayer	10.00	2.0	31	0.620	3
12) Disease control	Tractor	Power sprayer	10.00	2.0	31	0.620	3
13) Harvesting & threshing	Automobile	Combine	4.29	1.5	55	0.354	1
14) Grains transporting	Tractor	Trailer					
15) Straw transporting	Tractor	Trailer					
16) Grains drying	Manual						

Notes: 1/ For direct seeding method

Actual operation/working hours

Operation/working hours per ha

Ope. items	Machinery ope.		Number of workers	Total working hours		Machinery ope. hours		Total working hours (man-hours)	Total working hours (man-hours)	Ope./working efficiency (%)	Total fuel consumption (L/ha)
	hours	(hours)		hours	(man-hours)	hours	(hours)				
1)			2	12.00				15.00		80	
2)	3.13		1	3.13	4.30			4.30	5.5 x 4.30=23.650 (D)	72	
3)	0.92		1	3.68	5.30			5.30	5.5 x 5.30=29.150 (D)	70	
4)			2	4.00				5.00		80	
5)	0.46		1	0.46	0.58			0.58	5.5 x 0.58= 3.190 (D)	80	
6)			2	4.96				6.20		80	
7)			2	4.96				6.20		80	
8)			1	115.00				144.00		80	
9)			1	24.00				30.00		80	
10)	1.62 x 2		5	16.20	5.06			25.30	3.0 x 5.06=15.180 (D)	64	
11)	1.62 x 3		5	24.30	7.59			38.00	3.0 x 7.59=22.770 (D)	64	
12)	1.62 x 3		5	24.30	7.59			38.00	3.0 x 7.59=22.770 (D)	64	
13)	2.82		2	5.64	4.60			9.20	5.5 x 4.60=25.300 (D)	61	
14)	5.00		2	10.00	6.25			12.50	5.5 x 6.25=34.375 (D)	80	
15)	10.00		2	20.00	12.50			25.00	5.5 x 12.50=68.750 (D)	80	
16)			1	24.00				30.00		80	
<b>Total</b>								<u>394.58</u>			<u>245.135 (D)</u>

(D : Diesel oil)



Appendix D-2-2 Farming Operations System for Rice 1/ (A-2)

<u>Operation items</u>	<u>Power source</u>	<u>Implements or machinery</u>	<u>Op. width</u> (m)	<u>Op. Speed</u> (km/hr)	<u>Field op. efficiency</u> (%)	<u>Field op. capacity</u> (ha/hr)	<u>Op. times</u> (times)
1) Seed preparation	Manual						1
2) Plowing	Tractor	Bottom plow	1.00	4.5	71	0.320	1
3) Puddling	Tractor	Drive harrow	3.33	4.0	82	1.092	4
4) Pre-germinating	Manual						
5) Seeding	Tractor	Broadcaster	8.00	4.5	60	2.160	1
6) Fertilization 1)	Manual						
7) Fertilization 2)	Manual						
8) Irrigation management	Manual						
9) Weed control 1)	Manual						
10) Weed control 2)	Tractor	Power sprayer	10.00	2.0	31	0.620	2
11) Pest insects control	Tractor	Power sprayer	10.00	2.0	31	0.620	3
12) Disease control	Tractor	Power sprayer	10.00	2.0	31	0.620	3
13) Harvesting	Manual	Sickle					1
14) Stacking & drying	Manual						
15) Threshing	Automobile	Thresher					
16) Grains transporting	Tractor	Trailer					
17) Straw transporting	Tractor	Trailer					
18) Grains drying	Manual						

Note: 1/ For direct seeding method

Ope. items	Operation/working hours per ha			Actual operation/working hours			Total fuel consumption (L/ha)
	Machinery ope. hours (hours)	Number of workers	Total working hours (man-hours)	Machinery ope. hours (hours)	Total working hours (man-hours)	Ope./working efficiency (%)	
1)		2	12.00		15.00	80	
2)	3.13	1	3.13	4.30	4.30	72	5.5 x 4.30 = 23.650 (D)
3)	0.92	1	3.68	5.30	5.30	70	5.5 x 5.30 = 29.150 (D)
4)		2	4.00		5.00	80	
5)	0.46	1	0.46	0.58	0.58	80	5.5 x 0.58 = 3.190 (D)
6)		2	4.96		6.20	80	
7)		2	4.96		6.20	80	
8)		1	115.00		144.00	80	
9)		1	24.00		30.00	80	
10)	1.62 x 2	5	16.20	5.06	25.30	64	3.0 x 5.06 = 15.180 (D)
11)	1.62 x 3	5	24.30	7.59	38.00	64	3.0 x 7.59 = 22.770 (D)
12)	1.62 x 3	5	24.30	7.59	38.00	64	3.0 x 7.59 = 22.770 (D)
13)		1	120.00		150.00	80	
14)		1	24.00		30.00	80	
15)	10.00	4	40.00	12.50	50.00	80	1.0 x 12.50 = 12.500 (K)
16)	5.00	2	10.00	6.25	12.50	80	5.5 x 6.25 = 34.375 (D)
17)	10.00	2	20.00	12.50	25.00	80	5.5 x 12.50 = 68.750 (D)
18)		1	24.00		30.00	80	
<b>Total</b>					<u>615.38</u>		<u>219.835 (D) + 12.500 (K)</u>

(D : Diesel oil)  
(K : Kerosene)

Appendix D-2-3 Farming Operations System for Rice 1/ (A-1)

Operation items	Power source	Implements or machinery	Op. width (m)	Op. speed (km/hr)	Field op. efficiency (%)	Field op. capacity (ha/hr)	Op. times (time)
1) Seed preparation	Manual						1
2) Plowing 2/	Tractor	Bottom plow	1.00	4.5	71	0.320	1
3) Puddling 2/	Tractor	Drive harrow	3.33	4.0	82	1.092	4
4) Pre-germinating	Manual						
5) Seeding 2/	Tractor	Broadcaster	8.00	4.5	60	2.160	1
6) Fertilization 2/	Manual						
7) Irrigation management 2/	Manual						
8) Weed control 2/	Tractor	Power sprayer	10.00	2.0	31	0.620	1
9) Pest insects control 2/	Tractor	Power sprayer	10.00	2.0	31	0.620	1
10) Disease control 2/	Tractor	Power sprayer	10.00	2.0	31	0.620	1
11) Plowing	Tractor	Bottom plow	1.00	4.5	71	0.320	1
12) Puddling	Tractor	Drive harrow	3.33	4.0	82	1.092	4
13) Seeding, collection & transporting, transplanting	Manual						
14) Fertilization 1)	Tractor	Broadcaster	8.00	4.5	60	2.160	1
15) Fertilization 2)	Manual						
16) Irrigation management	Manual						
17) Weed control 1)	Manual						
18) Weed control 2)	Tractor	Power sprayer	10.00	2.0	31	0.620	2
19) Pest insects control	Tractor	Power sprayer	10.00	2.0	31	0.620	3
20) Disease control	Tractor	Power sprayer	10.00	2.0	31	0.620	3
21) Harvesting & threshing	Automobile	Combine	4.29	1.5	55	0.354	1
22) Grains transporting	Tractor	Trailer					
23) Straw transporting	Tractor	Trailer					
24) Grains drying	Manual						

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Notes: 1/ For transplanting method  
 2/ For nursery operations  
 3/ A = 1/8 (nursery area : field area = 1 : 8)

<u>Operation/working hours per ha</u>			<u>Actual operation/working hours</u>				
<u>Op. items</u>	<u>Machinery ope. hours (hours)</u>	<u>Number of workers</u>	<u>Total working hours (man-hours)</u>	<u>Machinery ope. hours (hours)</u>	<u>Total working hours (man-hours)</u>	<u>Op./working efficiency (%)</u>	<u>Total fuel consumption (L/ha)</u>
1)		2	12.00		15.00	80	
2)	3.13	1	3.13	4.30 x A <sup>3/</sup> = 0.54	4.30 x A = 0.54	72	5.5 x 0.54 = 2.970 (D)
3)	0.92	1	3.68	5.30 x A = 0.66	5.30 x A = 0.66	70	5.5 x 0.66 = 3.630 (D)
4)	0.46	2	4.00		5.00	80	
5)		1	0.46	0.58 x A = 0.07	0.58 x A = 0.07	80	5.5 x 0.07 = 0.385 (D)
6)		2	4.96		6.20 x A = 0.78	80	
7)		1	23.00		29.00 x A = 3.63	80	
8)	1.62	5	8.10	2.53 x A = 0.32	12.66 x A = 1.58	64	3.0 x 0.32 = 0.960 (D)
9)	1.62	5	8.10	2.53 x A = 0.32	12.66 x A = 1.58	64	3.0 x 0.32 = 0.960 (D)
10)	1.62	5	8.10	2.53 x A = 0.32	12.66 x A = 1.58	64	3.0 x 0.32 = 0.960 (D)
11)	3.13	1	3.13	4.30	4.30	72	5.5 x 4.30 = 23.650 (D)
12)	0.92	1	3.68	5.30	5.30	70	5.5 x 5.30 = 29.150 (D)
13)		2	208.00		260.00	80	
14)	0.46	1	0.46	0.58	0.58	80	5.5 x 0.58 = 3.190 (D)
15)		2	4.96		6.20	80	
16)		1	92.00		115.00	80	
17)		1	24.00		30.00	80	
18)	1.62 x 2	5	16.20	5.06	25.30	64	3.0 x 5.06 = 15.180 (D)
19)	1.62 x 3	5	24.30	7.59	38.00	64	3.0 x 7.59 = 22.770 (D)
20)	1.62 x 3	5	24.30	7.59	38.00	64	3.0 x 7.59 = 22.770 (D)
21)	2.82	2	5.64	4.60	9.20	61	7.0 x 4.60 = 32.200 (D)
22)	5.00	2	10.00	6.25	12.50	80	5.5 x 6.25 = 34.375 (D)
23)	10.00	2	20.00	12.50	25.00	80	5.5 x 12.50 = 68.750 (D)
24)		1	24.00		30.00	80	
<u>Total</u>			629.80		261.900 (D)		(D : Diesel oil)

Appendix D-2-3 Farming Operations System for Rice 1/ (A-2)

Operation items	Power source	Implements or machinery	Op. width (m)	Op. speed (km/hr)	Field op. efficiency (%)	Field op. capacity (ha/hr)	Op. times (times)
1) Seed preparation	Manual						1
2) Plowing 2/	Tractor	Bottom plow	1.00	4.5	71	0.320	1
3) Puddling 2/	Tractor	Drive harrow	3.33	4.0	82	1.092	4
4) Pre-germinating	Manual						
5) Seeding 2/	Tractor	Broadcaster	8.00	4.5	60	2.160	1
6) Fertilization 2/	Manual						
7) Irrigation management 2/	Manual						
8) Weed control 2/	Tractor	Power sprayer	10.00	2.0	31	0.620	1
9) Pest insects control 2/	Tractor	Power sprayer	10.00	2.0	31	0.620	1
10) Disease control 2/	Tractor	Power sprayer	10.00	2.0	31	0.620	1
11) Plowing	Tractor	Bottom plow	1.00	4.5	71	0.320	1
12) Puddling	Tractor	Drive harrow	3.33	4.0	82	1.092	4
13) Seedling collection & transporting, transplanting	Manual						
14) Fertilization 1)	Tractor	Broadcaster	8.00	4.5	60	2.160	1
15) Fertilization 2)	Manual						
16) Irrigation management	Manual						
17) Weed control 1)	Manual						
18) Weed control 2)	Tractor						
19) Pest insects control	Tractor	Power sprayer	10.00	2.0	31	0.620	2
20) Disease control	Tractor	Power sprayer	10.00	2.0	31	0.620	3
21) Harvesting	Tractor	Power sprayer	10.00	2.0	31	0.620	3
22) Stacking & drying	Manual	Sickle					
23) Threshing	Automobile	Thresher					
24) Grains transporting	Tractor	Trailer					
25) Straw transporting	Tractor	Trailer					
26) Grains drying	Manual						

Notes: 1/ For transplanting method  
 2/ For nursery operations  
 3/ A = 1/8 (nursery area: field area = 1 : 8)

Operation/working hours per ha				Actual operation/working hours			
Ope. items	Machinery ope. hours (hours)	Number of workers	Total working hours (man-hours)	Machinery ope. hours (hours)	Total working hours (man-hours)	Ope./working efficiency (%)	Total fuel consumption (L/ha)
1)		2	12.00		15.00	80	
2)	3.13	1	3.13	$4.30 \times A^3 = 0.54$	$4.30 \times A = 0.54$	72	$5.5 \times 0.54 = 2.970$ (D)
3)	0.92	1	3.68	$5.30 \times A = 0.66$	$5.30 \times A = 0.66$	70	$5.5 \times 0.66 = 3.630$ (D)
4)		2	4.00		5.00	80	
5)	0.46	1	0.46	$0.58 \times A = 0.07$	$0.58 \times A = 0.07$	80	$5.5 \times 0.07 = 0.385$ (D)
6)		2	4.96		$6.20 \times A = 0.78$	80	
7)		1	23.00		$29.00 \times A = 3.63$	80	
8)	1.62	5	8.10	$2.53 \times A = 0.32$	$12.66 \times A = 1.58$	64	$3.0 \times 0.32 = 0.960$ (D)
9)	1.62	5	8.10	$2.53 \times A = 0.32$	$12.66 \times A = 1.58$	64	$3.0 \times 0.32 = 0.960$ (D)
10)	1.62	5	8.10	$2.53 \times A = 0.32$	$12.66 \times A = 1.58$	64	$3.0 \times 0.32 = 0.960$ (D)
11)	3.13	1	3.13	4.30	4.30	72	$5.5 \times 4.30 = 23.650$ (D)
12)	0.92	1	3.70	5.30	5.30	70	$5.5 \times 5.30 = 29.150$ (D)
13)		2	208.00		260.00	80	
14)	0.46	1	0.46	0.58	0.58	80	$5.5 \times 0.58 = 3.190$ (D)
15)		2	4.96		6.20	80	
16)		1	92.00		115.00	80	
17)		1	24.00		30.00	80	
18)	1.62 x 2	5	16.20	5.06	25.30	64	$3.0 \times 5.06 = 15.180$ (D)
19)	1.62 x 3	5	24.30	7.59	38.00	64	$3.0 \times 7.59 = 22.770$ (D)
20)	1.62 x 3	5	24.30	7.59	38.00	64	$3.0 \times 7.59 = 22.770$ (D)
21)		1	120.00		150.00	80	
22)		1	24.00		30.00	80	
23)	10.00	4	40.00	12.50	50.00	80	$1.0 \times 12.50 = 12.500$ (K)
24)	5.00	2	10.00	6.25	12.50	80	$5.5 \times 6.25 = 34.375$ (D)
25)	10.00	2	20.00	12.50	25.00	80	$5.5 \times 12.50 = 68.750$ (D)
26)		1	24.00		30.00	80	
<b>Total</b>					<b>850.6</b>		<b>12.500 (K) + 229.700 (D)</b>

(K: Kerosene  
(D: Diesel oil)

Appendix D-2-4 Farming Operations System for Berseem

Operation items	Power source	Implements or machinery	Op. width (m)	Op. speed (km/hr)	Field ope. efficiency (%)	Field ope. capacity (ha/hr)	Op. times (times)
1) Seed preparation	Manual						1
2) Plowing <sup>1/</sup>	Tractor	Bottom plow	1.00	4.5	71	0.320	1
3) Harrowing <sup>1/</sup>	Tractor	Disk harrow	2.1/2	5.5	70	0.404	1
4) Levelling <sup>1/</sup>	Tractor	Tooth harrow	3.0/2	6.0	70	0.630	1
5) Seeding <sup>1/</sup>	Tractor	Broadcaster	8.00	4.5	60	2.160	1
6) Seeding	Manual						
7) Fertilization 1)	Tractor	Broadcaster	8.00	4.5	60	2.160	1
8) Fertilization 2)	Tractor	Broadcaster	8.00	4.5	60	2.160	1
9) Fertilization 3)	Tractor	Broadcaster	8.00	4.5	60	2.160	1
10) Irrigation management <sup>2/</sup>	Manual						
11) Irrigation management <sup>3/</sup>	Manual						
12) Pest insects control <sup>2/</sup>	Tractor	Power sprayer	10.00	2.0	31	0.620	3
13) Pest insects control <sup>3/</sup>	Tractor	Power sprayer	10.00	2.0	31	0.620	2
14) Disease control	Tractor	Power sprayer	10.00	2.0	31	0.620	2
15) Harvesting <sup>2/</sup>	Tractor	Reciprocating mower	1.50	3.5	55	0.290	4
16) Harvesting <sup>3/</sup>	Tractor	Reciprocating mower	1.50	3.5	55	0.290	2
17) Transporting <sup>2/</sup>	Tractor	Trailer					
18) Transporting <sup>3/</sup>	Tractor	Trailer					

Notes : 1/ Not applicable when cultivated in rice fields

2/ For full-term cropping

3/ For catch-cropping

Operation/working hours per ha                      Actual operation/working hours

Op. items	Machinery ope. hours (hours)	Number of workers	Total working hours (man-hours)	Machinery ope. hours (hours)	Total working hours (hours)	Op./working efficiency (%)	Total fuel consumption (L/ha)
1)		1	2.00		2.50	80	
2)	3.13	1	3.13	4.30	4.30	72	5.5 x 4.30=23.650 (D)
3)	2.48	1	2.48	3.54	3.54	70	5.5 x 3.54=19.470 (D)
4)	1.59	1	1.59	2.27	2.27	70	5.5 x 2.27=12.485 (D)
5)	0.46	1	0.46	0.58	0.58	80	5.5 x 0.58= 3.190 (D)
6)		2	4.96		6.20	80	
7)	0.46	1	0.46	0.58	0.58	80	5.5 x 0.58= 3.190 (D)
8)	0.46	1	0.46	0.58	0.58	80	5.5 x 0.58= 3.190 (D)
9)	0.46	1	0.46	0.58	0.58	80	5.5 x 0.58= 3.190 (D)
10)		1	45.60		57.00	80	
11)		1	29.40		36.70	80	
12)	1.62 x 3	5	24.30	7.59	38.00	64	3.0 x 7.59=22.770 (D)
13)	1.62 x 2	5	16.20	5.06	25.30	64	3.0 x 5.06=15.180 (D)
14)	1.62 x 2	5	16.20	5.06	25.30	64	3.0 x 5.06=15.180 (D)
15)	3.45 x 4	1	13.80	17.25	17.25	80	5.5 x 17.25=94.875 (D)
16)	3.45 x 2	1	6.90	8.63	8.63	80	5.5 x 8.63=47.465 (D)
17)	12.00	2	24.00	15.00	30.00	80	5.5 x 15.00=82.500 (D)
18)	6.00	2	12.00	7.50	15.00	80	5.5 x 7.50=41.250 (D)

<u>177.99</u> <sup>2/</sup>	<u>215.325</u> <sup>2/</sup> (D)
<u>125.28</u> <sup>3/</sup>	<u>184.250</u> <sup>3/</sup> (D)

(D : Diesel oil)



Appendix D-2-5 Farming Operations System for Cotton

<u>Operation items</u>	<u>Power source</u>	<u>Implements or machinery</u>	<u>Op. width</u> (m)	<u>Op. speed</u> (km/hr)	<u>Field op. efficiency</u> (%)	<u>Field op. capacity</u> (ha/hr)	<u>Op. times</u> (times)
1) Seed preparation	Manual						1
2) Fertilization 1)	Tractor	Broadcaster	8.00	4.5	60	2.160	1
3) Plowing	Tractor	Bottom plow	1.00	4.5	71	0.320	1
4) Harrowing	Tractor	Disk harrow	2.1/2	5.5	70	0.404	1
5) Ridging & seeding	Tractor	Seeder with ridger	1.80	2.0	36	0.130	1
6) Thinning	Manual						
7) Fertilization 2)	Manual						
8) Fertilization 3)	Manual						
9) Irrigation management	Manual						
10) Weed control	Tractor	Power sprayer	10.00	2.0	31	0.620	1
11) Pest insects control 1)	Manual						
12) Pest insects control 2)	Tractor	Power sprayer	10.00	2.0	31	0.620	2
13) Disease control	Tractor	Power sprayer	10.00	2.0	31	0.620	2
14) Harvesting	Manual						
15) Transporting	Tractor	Trailer					

Operation/working hours per haActual operation /working hours

<u>Ope. items</u>	<u>Machinery ope. hours (hours)</u>	<u>Number of workers</u>	<u>Total working hours (man-hours)</u>	<u>Machinery ope. hours (hours)</u>	<u>Total working hours (man-hours)</u>	<u>Ope./working efficiency (%)</u>	<u>Total fuel consumption (L/ha)</u>
1)		1	2.00		2.50	80	
2)	0.46	1	0.46	0.58	0.58	80	5.5 x 0.58= 3.190 (D)
3)	3.13	1	3.13	4.30	4.30	72	5.5 x 4.30=23.650 (D)
4)	2.48	1	2.48	3.54	3.54	70	5.5 x 3.54=19.470 (D)
5)	7.69	2	15.38	12.82	25.63	60	5.5 x12.82=70.510 (D)
6)		2	46.00		57.00	80	
7)		1	22.80		28.50	80	
8)		1	22.80		28.50	80	
9)		1	67.00		84.00	80	
10)	1.62	5	8.10	2.53	12.66	64	3.0 x 2.53=7.590 (D)
11)		10	344.00		430.00	80	
12)	1.62 x 2	5	16.20	5.06	25.30	64	3.0 x 5.06=15.180 (D)
13)	1.62 x 2	5	16.20	5.06	25.30	64	3.0 x 5.06=15.180 (D)
14)		10	504.00		630.00	80	
15)	5.00	2	10.00	6.25	12.50	80	5.5 x 6.25=34.375 (D)
<u>Total</u>					<u>1370.31</u>		<u>189.145 (D)</u> (D : Diesel oil)

<u>Operation items</u>	<u>Power source</u>	<u>Implements or machinery</u>	<u>Op. width (m)</u>	<u>Op. speed (km/hr)</u>	<u>Field ope. efficiency (%)</u>	<u>Field ope. capacity (ha/hr)</u>	<u>Op. times (times)</u>
1) Seed preparation	Manual						1
2) Plowing	Tractor	Bottom plow	1.00	4.5	71	0.320	1
3) Harrowing	Tractor	Disk harrow	2.1/2	5.5	70	0.404	1
4) Levelling	Tractor	Tooth harrow	3.0/2	6.0	70	0.630	1
5) Seeding	Tractor	Broadcaster	8.00	4.5	60	2.160	1
6) Fertilization	Manual						
7) Irrigation management	Manual						
8) Weed control	Tractor	Power sprayer	10.00	2.0	31	0.620	1
9) Pest insects control	Tractor	Power sprayer	10.00	2.0	31	0.620	2
10) Disease control	Tractor	Power sprayer	10.00	2.0	31	0.620	2
11) Harvesting & threshing	Automobile	Combine	4.29	1.5	55	0.354	1
12) Grains transporting	Tractor	Trailer					
13) Straw transporting	Tractor	Trailer					
14) Grains drying	Manual						

Operation/working hours per haActual operation/working hours

<u>Op. items</u>	<u>Machinery ope. hours (hours)</u>	<u>Number of workers</u>	<u>Total working hours (man-hours)</u>	<u>Machinery ope. hours (hours)</u>	<u>Total working hours (man-hours)</u>	<u>Op./working efficiency (%)</u>	<u>Total fuel consumption (L/ha)</u>
1)		1	2.0		2.50	80	
2)	3.13	1	3.13	4.30	4.30	72	5.5 x 4.30 = 23.650 (D)
3)	2.48	1	2.48	3.54	3.54	70	5.5 x 3.54 = 19.470 (D)
4)	1.59	1	1.59	2.27	2.27	70	5.5 x 2.27 = 12.485 (D)
5)	0.46	1	0.46	0.58	0.58	80	5.5 x 0.58 = 3.190 (D)
6)		2	4.96		6.20	80	
7)		1	45.60		57.00	80	
8)	1.62	5	8.10	2.53	12.70	64	3.0 x 2.53 = 7.590 (D)
9)	1.62 x 2	5	16.20	5.06	25.30	64	3.0 x 5.06 = 15.180 (D)
10)	1.62 x 2	5	16.20	5.06	25.30	64	3.0 x 5.06 = 15.180 (D)
11)	2.82	2	5.64	4.60	9.20	61	7.0 x 4.60 = 32.200 (D)
12)	5.00	2	10.00	6.25	12.50	80	5.5 x 6.25 = 34.375 (D)
13)	10.00	2	20.00	12.50	25.00	80	5.5 x 12.50 = 68.750 (D)
14)		1	24.00		30.00	80	

Total216.39232.070 (D)

(D: Diesel oil)

Operation items	Power source	Implements or machinery	Op. width (m)	Op. speed (km/hr)	Field op. efficiency (%)	Field op. capacity (ha/hr)	Op. times (times)
1) Seed preparation	Manual						1
2) Plowing	Tractor	Bottom plow	1.00	4.5	71	0.320	1
3) Harrowing	Tractor	Disk harrow	2.1/2	5.5	70	0.404	1
4) Levelling	Tractor	Tooth harrow	3.0/2	6.0	70	0.630	1
5) Seeding	Tractor	Broadcaster	8.00	4.5	60	2.160	1
6) Fertilization	Manual						
7) Irrigation management	Manual						
8) Weed control	Tractor	Power sprayer	10.00	2.0	31	0.620	1
9) Pest insects control	Tractor	Power sprayer	10.00	2.0	31	0.620	2
10) Disease control	Tractor	Power sprayer	10.00	2.0	31	0.620	2
11) Harvesting	Manual	Sickle					
12) Stacking & drying	Manual						
13) Threshing	Automobile	Thresher					
14) Grains transporting	Tractor	Trailer					
15) Straw transporting	Tractor	Trailer					
16) Grains drying	Manual						

Operation/working hours per haActual operation/working hours

Op. items	Machinery ope. hours (hours)	Number of workers	Total working hours (man-hours)	Machinery ope. hours (hours)	Total working hours (man-hours)	Ope./working efficiency (%)	Total fuel consumption (L/ha)
1)		1	2.0		2.50	80	
2)	3.13	1	3.13	4.30	4.30	72	5.5 x 4.30 = 23.650 (D)
3)	2.48	1	2.48	3.54	3.54	70	5.5 x 3.54 = 19.470 (D)
4)	1.59	1	1.59	2.27	2.27	70	5.5 x 2.27 = 12.485 (D)
5)	0.46	1	0.46	0.58	0.58	80	5.5 x 0.58 = 3.190 (D)
6)		2	4.96		6.20	80	
7)		1	45.60		57.00	80	
8)	1.62	5	8.10	2.53	12.70	64	3.0 x 2.53 = 7.590 (D)
9)	1.62 x 2	5	16.20	5.06	25.30	64	3.0 x 5.06 = 15.180 (D)
10)	1.62 x 2	5	16.20	5.06	25.30	64	3.0 x 5.06 = 15.180 (D)
11)		1	120.00		150.00	80	
12)		1	24.00		30.00	80	
13)	9.00	4	36.00	11.10	44.40	80	1.0 x 11.10 = 11.100 (K)
14)	5.00	2	10.00	6.25	12.50	80	5.5 x 6.25 = 34.375 (D)
15)	10.00	2	20.00	12.50	25.00	80	5.5 x 12.50 = 68.750 (D)
16)		1	24.00		30.00	80	
<u>Total</u>					<u>431.59</u>		<u>11.100 (K) + 199.870 (D)</u>

K: Kerosene  
(D: Diesel oil)

<u>Operation items</u>	<u>Power source</u>	<u>Implements or machinery</u>	<u>Op. width</u> (m)	<u>Op. speed</u> (km/hr)	<u>Field op. efficiency</u> (%)	<u>Field op. capacity</u> (ha/hr)	<u>Op. times</u> (times)
1) Seed preparation	Manual						1
2) Plowing	Tractor	Bottom plow	1.00	4.5	71	0.320	1
3) Harrowing	Tractor	Disk harrow	2.1/2	5.5	70	0.404	1
4) Ridging & seeding	Tractor	Seeder with ridger	1.80	2.0	36	0.130	1
5) Thinning	Manual						
6) Fertilization 1)	Manual						
7) Fertilization 2)	Manual						
8) Irrigation management	Manual						
9) Weed control	Tractor	Power sprayer	10.00	2.0	31	0.620	1
10) Pest insects control	Tractor	Power sprayer	10.00	2.0	31	0.620	2
11) Disease control	Tractor	Power sprayer	10.00	2.0	31	0.620	2
12) Harvesting	Manual						
13) Transporting	Tractor	Trailer					
14) Husking & drying	Manual						
15) Shelling	Automobile	Corn-sheller					

Actual operation /working hours

Operation/working hours per ha

Ope. items	Operation/working hours per ha		Actual operation /working hours			Total fuel consumption (L/ha)
	Machinery ope. hours (hours)	Number of workers	Total working hours (man-hours)	Machinery ope. hours (hours)	Total working hours (man-hours)	
1)		1	2.00		2.50	80
2)	3.13	1	3.13	4.30	4.30	5.5 x 4.30=23.650 (D)
3)	2.48	1	2.48	3.54	3.54	5.5 x 3.54=19.470 (D)
4)	7.69	2	15.38	12.82	25.63	5.5 x 12.82=70.510 (D)
5)		2	23.20		29.00	80
6)		1	30.40		38.00	80
7)		1	30.40		38.00	80
8)		1	152.00		190.00	80
9)	1.62	5	8.10	2.53	12.70	3.0 x 2.53= 7.590 (D)
10)	1.62 x 2	5	16.20	5.06	25.30	3.0 x 5.06=15.180 (D)
11)	1.62 x 2	5	16.20	5.06	25.30	3.0 x 5.06=15.180 (D)
12)		2	76.00		95.00	80
13)	12.00	2	24.00	15.00	30.00	5.5 x 15.00=82.500 (D)
14)		2	72.00		90.00	80
15)	2.00	2	4.00	2.50	5.00	2.0 x 2.50= 5.000 (D)

Total

614.27

239.080 (D)  
(D : Diesel oil)



<u>Operation items</u>	<u>Power source</u>	<u>Implements or machinery</u>	<u>Op. width</u> (m)	<u>Op. speed</u> (km/hr)	<u>Field ope. efficiency</u> (%)	<u>Field ope. capacity</u> (ha/hr)	<u>Op. times</u> (times)
1) Seed preparation	manual						1
2) plowing	Tractor	Bottom plow	1.00	4.5	71	0.320	1
3) Harrowing	Tractor	Disk harrow	2.1/2	5.5	70	0.404	1
4) Ridging & seeding	Tractor	Seeder with ridger	1.80	2.0	36	0.130	1
5) Fertilization 1)	Manual						
6) Fertilization 2)	Manual						
7) Irrigation management	Manual						
8) Weed control	Tractor	Power sprayer	10.00	2.0	31	0.620	1
9) Pest insects control	Tractor	Power sprayer	10.00	2.0	31	0.620	1
10) Disease control	Tractor	Power sprayer	10.00	2.0	31	0.620	1
11) Harvesting	Tractor	Corn harvester	0.90	5.8	55	0.290	1
12) Transporting	Tractor	Trailer					

Actual operation/working hours

Operation/working hours per ha

Op. items	Machinery ope. hours (hours)	Number of workers	Total working hours (man-hours)	Machinery ope. hours (hours)	Total working hours (man-hours)	Op./working efficiency (%)	Total fuel consumption (L/ha)
1)		1	2.00		2.50	80	
2)	3.13	1	3.13	4.30	4.30	72	5.5 x 4.30=23.650 (D)
3)	2.48	1	2.48	3.54	3.54	70	5.5 x 3.54=19.470 (D)
4)	7.69	2	15.38	12.82	25.63	60	5.5 x 12.82=70.510 (D)
5)		1	30.40		38.00	80	
6)		1	30.40		38.00	80	
7)		1	112.00		140.00	80	
8)	1.62	5	8.10	2.53	12.70	64	3.0 x 2.53= 7.590 (D)
9)	1.62	5	8.10	2.53	12.70	64	3.0 x 2.53= 7.590 (D)
10)	1.62	5	8.10	2.53	12.70	64	3.0 x 2.53= 7.590 (D)
11)	3.45	1	3.45	4.31	4.31	80	5.5 x 4.31=23.705 (D)
12)	12.00	2	24.00	15.00	30.00	80	5.5 x 15.00=82.500 (D)

Total

324.38

242.605 (D)  
(D : Diesel oil)

Item	Unit	(per ha)							
		Rice <sup>1/</sup>	Rice <sup>2/</sup>	Berseem <sup>3/</sup>	Berseem <sup>4/</sup>	Cotton	Wheat	Maize	Green fodder maize
Seed	kg	140	140	60	60	140	180	50	50
Disinfectant <sup>18/</sup>	kg	1.1	1.1	0.5	0.5	1.1	1.4	0.4	0.4
Salt <sup>19/</sup>	kg	44	44	-	-	-	-	-	-
Urea (N: 46%)	kg	240	265 <sup>5/</sup>	-	-	360	260	360	360
S.P. (P <sub>2</sub> O <sub>5</sub> : 15%)	kg	230	230	480	360	240	-	-	-
Insecticide	ℓ	1.8 <sup>11/</sup>	1.9 <sup>6,11/</sup>	1.8 <sup>11/</sup>	1.2 <sup>11/</sup>	1.2 <sup>11/</sup>	1.2 <sup>11/</sup>	1.2 <sup>11/</sup>	0.6 <sup>11/</sup>
Fungicide	kg	3.0 <sup>12/</sup>	3.1 <sup>7,12/</sup>	2.0 <sup>13/</sup>	2.0 <sup>13/</sup>	2.0 <sup>13/</sup>	2.0 <sup>13/</sup>	2.0 <sup>13/</sup>	1.0 <sup>13/</sup>
Herbicide	ℓ	20.0 <sup>14/</sup>	21.3 <sup>8,14/</sup>	-	-	3.0 <sup>15/</sup>	1 kg <sup>15/</sup>	2 kg <sup>17/</sup>	2 kg <sup>17/</sup>
Fuel									
Alt.I Diesel	ℓ	245 <sup>9/</sup>	262 <sup>9/</sup>	215	184	189	232 <sup>9/</sup>	239	243
Alt.II Oil	ℓ	220 <sup>10/</sup>	230 <sup>10/</sup>	-	-	-	200 <sup>10/</sup>	-	-
Kerosene	ℓ	13	13	-	-	-	11	-	-

Notes: <sup>1/</sup> Direct seeding method  
<sup>2/</sup> Transplanting method  
<sup>3/</sup> Full-term  
<sup>4/</sup> Catch-cropping  
<sup>5/</sup> 25 kg + (120 kg x 2)  
<sup>6/</sup> 0.075 ℓ + (0.6 ℓ x 3)  
<sup>7/</sup> 0.125 kg + (1 kg x 3)  
<sup>8/</sup> 1.25 ℓ + (10 ℓ x 2)  
<sup>9/</sup> Harvested by combine  
<sup>10/</sup> Reaped with sickle

<sup>11/</sup> Recommended: MEP (0.6 ℓ/time)  
<sup>12/</sup> Recommended: Kasugamycin  
<sup>13/</sup> Recommended: Topzin - M  
<sup>14/</sup> Recommended: DCPA  
<sup>15/</sup> Recommended: Corbex  
<sup>16/</sup> Recommended: CAT  
<sup>17/</sup> Recommended: Gesaprim  
<sup>18/</sup> For seed, recommended: Captain  
<sup>19/</sup> Salt: Water = 4 kg : 18 ℓ

Appendix D-2-10

Governmental Target Yields per Feddan for Main Crops<sup>1/</sup>

Crop Items	Yield Unit	Year after Leaching					
		1st	2nd	3rd	4th	5th	6th
<u>Summer Crops</u>							
Cotton	Kantar	-	-	2.5	5	7	8
Rice	Ton	0.5	1	1.5	2.5	2.5	3
Maize	Ardeb	4	6	8	11	14	16
Sorghum	Ardeb	6	8	10	13	14	15
Sunflower	Ton	0.3	0.4	0.5	0.7	0.7	0.7
Soybean	Ton	0.3	0.4	0.5	0.7	0.7	0.7
Cow pea	Ton	3	4	4	5	6	8
Alfalfa	Ton	10	12	16	22	28	30
<u>Winter Crops</u>							
Wheat	Ardeb	3	4.5	7	9.5	10.5	12
Barley	Ardeb	5	7	8	10	12	15
Flax straw	Ton	1	1.5	1.5	2	2	2
Linseeds	Ton	0.1	0.2	0.2	0.3	0.3	0.3
Berseem <sup>1/</sup>	Ton	4	5	6	8	10	12
Berseem <sup>2/</sup>	Ton	8	10	12	16	20	24
Sugarcane	Ton	-	-	-	30	35	40

Data Source: Ministry of Land Reclamation

Notes: <sup>1/</sup> Yields in newly reclaimed areas especially with clayey soils after leaching has been done

<sup>2/</sup> Catch-cropping

<sup>3/</sup> Full-term cropping

Appendix D-2-11 Target Yield of Rice<sup>1/</sup>

<u>Year after leaching</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>
<u>Target yield (tons/ha)</u>	1.2	2.4	3.6	6.0	6.0	7.1
<u>Fertilization level (kg/ha)</u>						
1) Urea (N: 46%)						
1st top dressing	60	80	100	120	120	120
2nd top dressing	60	80	100	120	120	120
2) S.P. (P <sub>2</sub> O <sub>5</sub> : 15%)						
Basic	115	150	190	230	230	230

Note: <sup>1/</sup> Determined based on general target yields as fixed by the government

Appendix D-2-11

Target Yield of Full-term Berseem<sup>1/</sup>

<u>Year after leaching</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>
<u>Target yield (tons/ha)<sup>2/</sup></u>	19	24	29	38	48	57
<u>Fertilization level (kg/ha)</u>						
S.P. (P <sub>2</sub> O <sub>5</sub> : 15%)						
1st top dressing	120	160	200	240	240	240
2nd top dressing	60	80	100	120	120	120
3rd top dressing <sup>3/</sup>	60	80	100	120	120	120

Notes: 1/ Determined based on general target yields as fixed by the government

2/ 50% for catch-cropping berseem

3/ Not applicable to catch-cropping berseem

Appendix D-2-11

Target Yield of Seed Cotton<sup>1/</sup>

<u>Year</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
<u>Target yield (tons/ha)</u>	0.9	1.9	2.6	3.0
<u>Fertilization level (kg/ha)</u>				
1) Urea (N: 46%)				
1st top dressing	90	120	150	180
2nd top dressing	90	120	150	180
2) S.P. (P <sub>2</sub> O <sub>5</sub> : 15%)				
Basic	120	160	200	240

Note: <sup>1/</sup> Determined based on general target yield as fixed by the government

Appendix D-2-11

Target Yield of Wheat <sup>1/</sup>

<u>Year</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
<u>Target yield (tons/ha)</u>	2.5	3.4	3.7	4.3
<u>Fertilization level (kg/ha)</u>				
Urea (N: 46%)				
Top dressing	130	170	210	260

Note: <sup>1/</sup> Determined based on general target yield as fixed by the government



Appendix D-2-11

Target Yield of Maize<sup>1/</sup>

<u>Year</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
<u>Target yield (tons/ha)</u>	2.7	3.7	4.7	5.3
<u>Fertilization level (kg/ha)</u>				
Urea (N: 46%)				
1st top dressing	90	120	150	180
2nd top dressing	90	120	150	180

Note: <sup>1/</sup> Determined based on general target yield as fixed by the government

Appendix D-2-11

Target Yield of Green Fodder Maize

<u>Year</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
<u>Target yield (tons/ha)</u>	30.0	41.0	52.0	60.0
<u>Fertilization level (kg/ha)</u>				
Urea (N: 46%)				
1st top dressing	90	120	150	180
2nd top dressing	90	120	150	180

Appendix D-2-12 Computation of Annual Total Target Production  
of Rice in the Project Life

<u>Year in the Project Life</u>	<u>Target Yield (tons/ha) x Cultivation Area (ha)</u>	<u>Total Target Production (tons)</u>
<u>3rd</u>	1.2x4,180.0	= 5,016
<u>4th</u>	(2.4x4,180.0)+(1.2x4,180.0)	= 15,048
<u>5th</u>	(3.6x4,180.0)+(2.4x4,180.0)+(1.2x4,180.0)	= 30,096
<u>6th</u>	(6.0x1,379.4)+(3.6x4,180.0)+(2.4x4,180.0)+(1.2x4,180.0)	≠ 38,372
<u>7th</u>	(6.0x1,379.4)+(6.0x1,379.4)+(3.6x4,180.0)+(2.4x4,180.0)+(1.2x4,180.0)	≠ 46,649
<u>8th</u>	(7.1x1,379.4)+(6.0x1,379.4)+(6.0x1,379.4)+(3.6x4,180.0)+(2.4x4,180.0)	≠ 51,427
<u>9th</u>	(7.1x1,379.4)+(7.1x1,379.4)+(6.0x1,379.4)+(6.0x1,379.4)+(3.6x4,180.0)	≠ 51,188
<u>10th</u>	(7.1x1,379.4)+(7.1x1,379.4)+(7.1x1,379.4)+(6.0x1,379.4)+(6.0x1,379.4)	≠ 45,934
<u>11th</u>	(7.1x1,379.4)+(7.1x1,379.4)+(7.1x1,379.4)+(7.1x1,379.4)+(6.0x1,379.4)	≠ 47,451
<u>12th</u>	(7.1x1,379.4)+(7.1x1,379.4)+(7.1x1,379.4)+(7.1x1,379.4)+(7.1x1,379.4)	≠ 48,969 <sup>1/2</sup>

Note: 1/2 Maximum total target production

Appendix D-2-12 Computation of Annual Total Target Production  
of Full-term Berseem in the Project Life

<u>Year in the Project Life</u>	<u>Target Yield (tons/ha) x Cultivation Area (ha)</u>	<u>Total Target Production (tons)</u>
<u>3rd</u>	19x4,180.0	<u>1/</u> 19,855 + 59,565
<u>4th</u>	(24x4,180.0)+(19x4,180.0)	= 44,935 + 134,805
<u>5th</u>	(29x2,800.6)+(24x4,180.0)+(19x4,180.0)	≠ 65,239 + 195,718
<u>6th</u>	(38x1,379.4)+(29x2,800.6)+(24x4,180.0)+(19x4,180.0)	≠ 78,344 + 235,031
<u>7th</u>	(48x1,379.4)+(38x1,379.4)+(29x2,800.6)+(24x4,180.0)+(19x4,180.0)	≠ 94,896 + 284,690
<u>8th</u>	(57x1,379.4)+(48x1,379.4)+(38x1,379.4)+(29x2,800.6)+(24x4,180.0)	≠ 94,698 + 284,094
<u>9th</u>	(57x1,379.4)+(57x1,379.4)+(48x1,379.4)+(38x1,379.4)+(29x2,800.6)	≠ 89,274 + 267,823
<u>10th</u>	(57x1,379.4)+(57x1,379.4)+(57x1,379.4)+(48x1,379.4)+(38x1,379.4)	≠ 88,626 + 265,880
<u>11th</u>	(57x1,379.4)+(57x1,379.4)+(57x1,379.4)+(57x1,379.4)+(48x1,379.4)	≠ 95,179 + 285,535
<u>12th</u>	(57x1,379.4)+(57x1,379.4)+(57x1,379.4)+(57x1,379.4)+(57x1,379.4)	≠ 98,282 <sup>3/</sup> + 294,847 <sup>3/</sup>
<u>13th</u>		

Notes: 1/ Production in the first year in the same cropping season

2/ Production in the second year in the same cropping season

3/ Maximum total target production

Appendix D-2-12 Computation of Annual Total Target Production  
of Catch-cropping Berseem in the Project Life

<u>Year in the Project Life</u>	<u>Target Yield (tons/ha)</u>	<u>Cultivation Area (ha)</u>	<u>Total Target Production (tons)</u>
			<u>1/</u> <u>2/</u>
<u>5th</u>	14.5x1,379.4		≐ 10,001 + 10,001
<u>6th</u>	(19.0x1,421.2)+(14.5x1,379.4)		≐ 23,502 + 23,502
<u>7th</u>	(24.0x1,421.2)+(19.0x1,421.2)+(14.5x1,379.4)		≐ 40,556 + 40,556
<u>8th</u>	(28.5x1,421.2)+(24.0x1,421.2)+(19.0x1,421.2)+(14.5x1,379.4)		≐ 60,809 + 60,809
<u>9th</u>	(28.5x1,421.2)+(28.5x1,421.2)+(24.0x1,421.2)+(19.0x1,421.2)+(14.5x1,379.4)		≐ 81,061 + 81,061
<u>10th</u>	(28.5x1,421.2)+(28.5x1,421.2)+(28.5x1,421.2)+(24.0x1,421.2)+(19.0x1,421.2)+(14.5x1,379.4)		≐ 91,312 + 91,312
<u>11th</u>	(28.5x1,421.2)+(28.5x1,421.2)+(28.5x1,421.2)+(28.5x1,421.2)+(24.0x1,421.2)+(19.0x1,421.2)+(14.5x1,379.4)		≐ 98,063 + 98,063
<u>12th</u>	(28.5x1,421.2)+(28.5x1,421.2)+(28.5x1,421.2)+(28.5x1,421.2)+(28.5x1,421.2)+(24.0x1,421.2)+(19.0x1,421.2)+(14.5x1,379.4)		≐101,261 <sup>3/</sup> +101,261 <sup>3/</sup>
<u>13th</u>			

Notes: 1/ Production in the first year in the same cropping season  
2/ Production in the second year in the same cropping season  
3/ Maximum total target production

Appendix D-2-12 Computation of Annual Total Target Production  
of Cotton in the Project Life

<u>Year in the Project Life</u>	<u>Target Yield (tons/ha) x Cultivation Area (ha)</u>	<u>Total Target Production (tons)</u>
<u>6th</u>	0.9x1,379.4	≠ 1,241
<u>7th</u>	(1.9x1,379.4)+(0.9x1,379.4)	≠ 3,862
<u>8th</u>	(2.6x1,379.4)+(1.9x1,379.4)+(0.9x1,379.4)	≠ 7,449
<u>9th</u>	(3.0x1,379.4)+(2.6x1,379.4)+(1.9x1,379.4)+(0.9x1,379.4)	≠ 11,587
<u>10th</u>	(3.0x1,379.4)+(3.0x1,379.4)+(2.6x1,379.4)+(1.9x1,379.4)+(0.9x1,379.4)	≠ 15,725
<u>11th</u>	(3.0x1,379.4)+(3.0x1,379.4)+(3.0x1,379.4)+(2.6x1,379.4)+(1.9x1,379.4)	≠ 18,622
<u>12th</u>	(3.0x1,379.4)+(3.0x1,379.4)+(3.0x1,379.4)+(3.0x1,379.4)+(2.6x1,379.4)	≠ 20,139
<u>13th</u>	(3.0x1,379.4)+(3.0x1,379.4)+(3.0x1,379.4)+(3.0x1,379.4)+(3.0x1,379.4)	= 20,691 <sup>1/</sup>

Note: 1/ Maximum total target production

Appendix D-2-12 Computation of Annual Total Target Production  
of Wheat in the Project Life

<u>Year in the Project Life</u>	<u>Target Yield (tons/ha) x Cultivation Area (ha)</u>	<u>Total Target Production (tons)</u>
<u>7th</u>	2.5x1,379.4	3,449
<u>8th</u>	(3.4x1,379.4)+(2.5x1,379.4)	8,138
<u>9th</u>	(3.7x1,379.4)+(3.4x1,379.4)+(2.5x1,379.4)	13,242
<u>10th</u>	(4.3x1,379.4)+(3.7x1,379.4)+(3.4x1,379.4)+(2.5x1,379.4)	19,174
<u>11th</u>	(4.3x1,379.4)+(4.3x1,379.4)+(3.7x1,379.4)+(3.4x1,379.4)+(2.5x1,379.4)	25,105
<u>12th</u>	(4.3x1,379.4)+(4.3x1,379.4)+(4.3x1,379.4)+(3.7x1,379.4)+(3.4x1,379.4)	27,588
<u>13th</u>	(4.3x1,379.4)+(4.3x1,379.4)+(4.3x1,379.4)+(4.3x1,379.4)+(3.7x1,379.4)	28,829
<u>14th</u>	(4.3x1,379.4)+(4.3x1,379.4)+(4.3x1,379.4)+(4.3x1,379.4)+(4.3x1,379.4)	29,657 <sup>1/</sup>

Note: 1/ Maximum total target production

Appendix D-2-12 Computation of Annual Total Target Production  
of Maize in the Project Life

<u>Year in the Project Life</u>	<u>Target Yield (tons/ha) x Cultivation Area (ha)</u>	<u>Total Target Production (tons)</u>
<u>6th</u>	2.7 x 710.6	1,919
<u>7th</u>	(3.7x710.6)+(2.7x710.6)	4,548
<u>8th</u>	(4.7x710.6)+(3.7x710.6)+(2.7x710.6)	7,888
<u>9th</u>	(5.3x710.6)+(4.7x710.6)+(3.7x710.6)+(2.7x710.6)	11,654
<u>10th</u>	(5.3x710.6)+(5.3x710.6)+(4.7x710.6)+(3.7x710.6)+(2.7x710.6)	15,420
<u>11th</u>	(5.3x710.6)+(5.3x710.6)+(5.3x710.6)+(4.7x710.6)+(3.7x710.6)	17,268
<u>12th</u>	(5.3x710.6)+(5.3x710.6)+(5.3x710.6)+(5.3x710.6)+(4.7x710.6)	18,405
<u>13th</u>	(5.3x710.6)+(5.3x710.6)+(5.3x710.6)+(5.3x710.6)+(5.3x710.6)	18,831 <sup>1/</sup>

Note: <sup>1/</sup> Maximum total target production



Appendix D-2-12 Computation of Annual Total Target Production  
of Green Fodder Maize in the Project Life

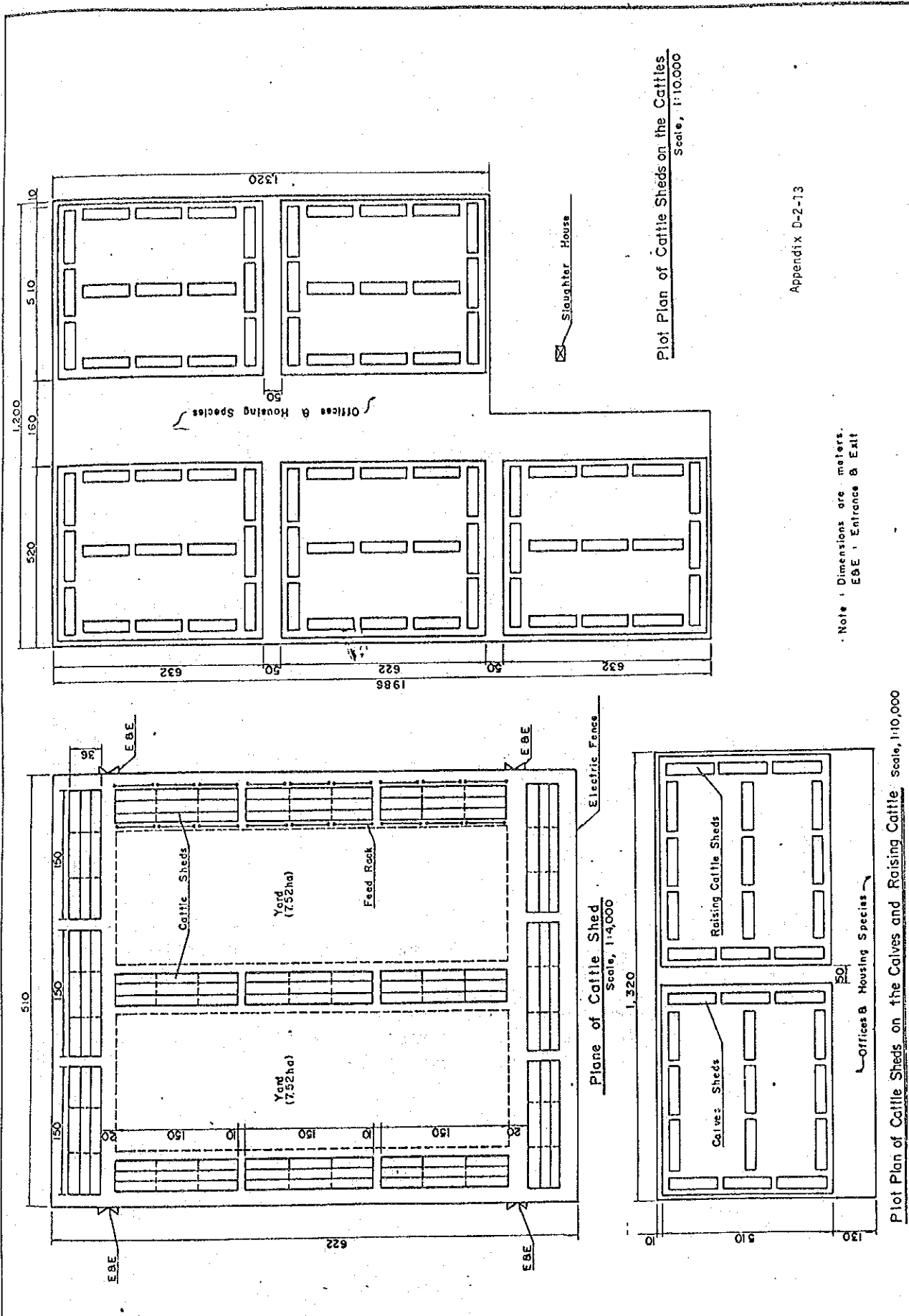
<u>Year in the Project Life</u>	<u>Target Yield (tons/ha) x Cultivation Area (ha)</u>	<u>Total Target Production (tons)</u>
<u>6th</u>	30x710.6	= 21,318
<u>7th</u>	(41x710.6)+(30x710.6)	≠ 50,453
<u>8th</u>	(52x710.6)+(41x710.6)+(30x710.6)	≠ 87,404
<u>9th</u>	(60x710.6)+(52x710.6)+(41x710.6)+(30x710.6)	≠ 130,040
<u>10th</u>	(60x710.6)+(60x710.6)+(52x710.6)+(41x710.6)+(30x710.6)	≠ 172,676
<u>11th</u>	(60x710.6)+(60x710.6)+(60x710.6)+(52x710.6)+(41x710.6)	≠ 193,994
<u>12th</u>	(60x710.6)+(60x710.6)+(60x710.6)+(60x710.6)+(52x710.6)	≠ 207,495
<u>13th</u>	(60x710.6)+(60x710.6)+(60x710.6)+(60x710.6)+(60x710.6)	= 213,180 <sup>1/</sup>

Note: 1/ Maximum total target production

Appendix D-2-12 Computation of Annual Total Target Production  
of Rice Straw in the Project Life

<u>Year in the Project Life</u>	<u>Target Yield (tons/ha) x Cultivation Area (ha)</u>	<u>Total Target Production (tons)</u>
<u>3rd</u>	0.8x4,180.0	= 3,344
<u>4th</u>	(1.7x4,180.0)+(0.8 x4,180.0)	= 10,450
<u>5th</u>	(2.5x4,180.0)+(1.7x4,180.0)+(0.8x4,180.0)	= 20,900
<u>6th</u>	(4.2x1,379.4)+(2.5x4,180.0)+(1.7x4,180.0)+(0.8x4,180.0)	≠ 26,693
<u>7th</u>	(4.2x1,379.4)+(4.2x1,379.4)+(2.5x4,180.0)+(1.7x4,180.0)+(0.8x4,180.0)	≠ 32,487
<u>8th</u>	(5.0x1,379.4)+(4.2x1,379.4)+(4.2x1,379.4)+(2.5x4,180.0)+(1.7x4,180.0)	≠ 36,040
<u>9th</u>	(5.0x1,379.4)+(5.0x1,379.4)+(4.2x1,379.4)+(4.2x1,379.4)+(2.5x4,180.0)	≠ 35,831
<u>10th</u>	(5.0x1,379.4)+(5.0x1,379.4)+(5.0x1,379.4)+(4.2x1,379.4)+(4.2x1,379.4)	≠ 32,278
<u>11th</u>	(5.0x1,379.4)+(5.0x1,379.4)+(5.0x1,379.4)+(5.0x1,379.4)+(4.2x1,379.4)	≠ 33,381
<u>12th</u>	(5.0x1,379.4)+(5.0x1,379.4)+(5.0x1,379.4)+(5.0x1,379.4)+(5.0x1,379.4)	≠ 34,485 <sup>1/</sup>

Note : 1/ Maximum total target production



Plot Plan of Cattle Sheds on the Cattles  
Scale, 1:10,000

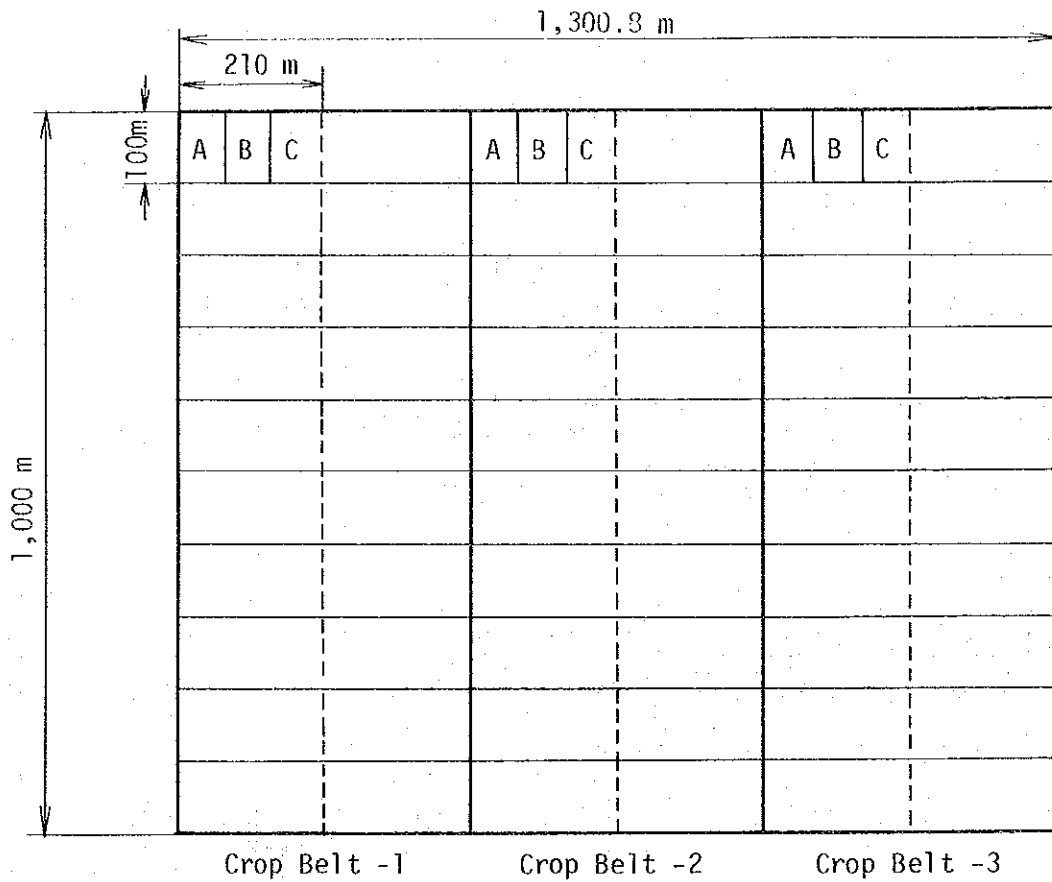
Plane of Cattle Shed  
Scale, 1:4,000

Plot Plan of Cattle Sheds on the Calves and Raising Cattle scale, 1:10,000

Appendix D-2-13

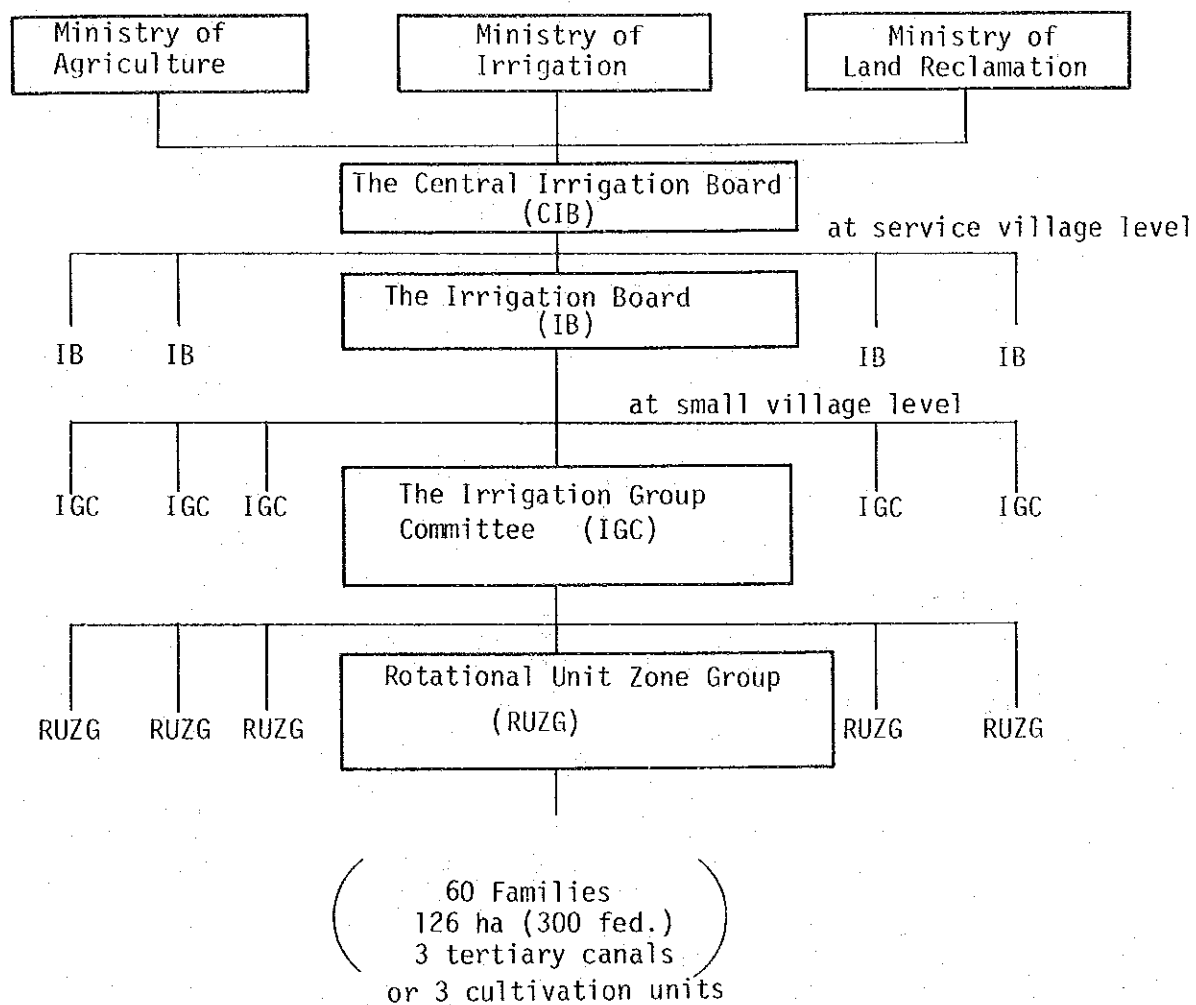
Note : Dimensions are meters.  
EBE : Entrance & Exit

Appendix D-2-14 Crop Belt Arrangement for Rotational Unit Zone



- Legend
- : Tertiary canal
  - A: The land held by the farmer-A
  - B: The land held by the farmer-B
  - C: The land held by the farmer-C

Farming Unit Organizational Structure <sup>1/</sup>



Note: <sup>1/</sup> Farming organization with special emphasis on irrigation management

## Appendix D-2-16

Specifications of Agricultural Machinery &  
Implements Utilized with the Project

<u>Items</u>	<u>Ope. width (Ope. capacity)</u>	<u>Capacity</u>	<u>Remarks</u>
Tractor		90 p.s. (engine output)	wheel-type 3-point linkage type
Disk harrow	2.10 m		
Broadcaster	8.00 m	500-600 L (hopper capacity)	
Bottom plow	1.00 m		14" x 3 type 3-point linkage type
Drive harrow	3.33 m		
Tooth harrow	3.00 m		30 teeth x 3 type
Trailer		2.00 tons (max. load. cap.)	
Seeder with ridger	1.80 m		2-row type
Power sprayer	10.00 m	300-600 L (tank capacity)	jet-nozzle type by tractor P.T.O.
Reciprocating mover	1.50 m		
Corn sheller	2-2.5 tons/hr	8 p.s. (engine output)	
Combine	4.29 m		common type
Thresher	0.6-0.8 tons/hr		for rice & wheat
Corn harvester	1 row		by tractor P.T.O.

Appendix D-2-17 Monthly Operation Hours of Machinery & Implements for Rice  
by Farming Operation Items 1/ (A-1)

Farming operation items	Machinery or implements	Monthly operation hours (hours/ha)														
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
Plowing	Tractor	4.30			1.40	3.00										
	Bottom plow	4.30			1.40	3.00										
Puddling	Tractor	5.30				5.30										
	Drive harrow	5.30				5.30										
Seeding	Tractor	0.58				0.58										
	Broadcaster	0.58				0.58										
Weed control	Tractor	5.06			1.10	2.16	1.80									
	Power sprayer	5.06			1.10	2.16	1.80									
Pest insects control	Tractor	7.59					3.04	3.04	1.51							
	Power sprayer	7.59					3.04	3.04	1.51							
Disease control	Tractor	7.59					3.04	3.04	1.51							
	Powersprayer	7.59					3.04	3.04	1.51							
Harvesting & threshing	Combine	4.60											4.60			
	Tractor	6.25											6.25			
Grains transporting	Trailer	6.25											6.25			
	Tractor	12.50											12.50			
Straw transporting	Tractor	12.50											12.50			
	Trailer	12.50											12.50			

Note: 1/ For direct seeding method

Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Rice 1/ (A-1)

Machinery or implements	Monthly operation hours (hours/ha)												
	Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tractor	49.27				1.40	9.98	2.16	7.88	6.08	3.02	18.75		
Bottom plow	4.40				1.40	3.00							
Drive harrow	5.30					5.30							
Broadcaster	0.58					0.58							
Power sprayer	20.24					1.10	2.16	7.88	6.08	3.02			
Trailer	18.75										18.75		
Combine	4.60												4.60

Note: 1/ For direct seeding method



Monthly Operation Hours of Machinery & Implements for Rice  
by Farming Operation Items 1/ (A-2)

Farming operation items	Machinery or implements	Monthly operation hours (hours/ha)															
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
Plowing	Tractor	4.30				1.40	3.00										
	Bottom plow	4.30				1.40	3.00										
Puddling	Tractor	5.30					5.30										
	Drive harrow	5.30					5.30										
Seeding	Tractor	0.58					0.58										
	Broadcaster	0.58					0.58										
Weed control	Tractor	5.06					1.10	2.16	1.80								
	Power sprayer	5.06					1.10	2.16	1.80								
Pest insects control	Tractor	7.59							3.04	3.04	1.51						
	Power sprayer	7.59							3.04	3.04	1.51						
Disease control	Tractor	7.59							3.04	3.04	1.51						
	Power sprayer	7.59							3.04	3.04	1.51						
Harvesting	Sickle	150.00												150.00			
	Thresher	12.50												12.50			
Grains transporting	Tractor	6.25												6.25			
	Trailer	6.25												6.25			
Straw transporting	Tractor	12.50												12.50			
	Trailer	12.50												12.50			

Note: 1/ For direct seeding method

Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Rice <sup>1/</sup> (A-2)

Machinery or implements	Monthly operation hours (hours/ha)												
	Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tractor	49.27				1.40	9.98	2.16	7.88	6.08	3.02	18.75		
Bottom plow	4.40				1.40	3.00							
Drive harrow	5.30					5.30							
Broadcaster	0.58					0.58							
Power sprayer	20.24					1.10	2.16	7.88	6.08	3.02			
Trailer	18.75										18.75		
Sickle	150.00										150.00		
Thresher	12.50											12.50	

Note: <sup>1/</sup> For direct seeding method

Appendix D-2-17 Monthly Operation Hours of Machinery & Implements for Rice  
by Farming Operation Items <sup>1/</sup> (A-1)

Farming operation items	Machinery or implements	Monthly operation hours (hours/ha)												
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Plowing <sup>2/</sup>	Tractor	0.54				0.27	0.27							
	Bottom plow	0.54				0.27	0.27							
Puddling <sup>2/</sup>	Tractor	0.66					0.66							
	Drive harrow	0.66					0.66							
Seeding <sup>2/</sup>	Tractor	0.07					0.07							
	Broadcaster	0.07					0.07							
Weed control <sup>2/</sup>	Tractor	0.32					0.32							
	Power sprayer	0.32					0.32							
Pest insects control <sup>2/</sup>	Tractor	0.32					0.32							
	Power sprayer	0.32					0.32							
Diseas control <sup>2/</sup>	Tractor	0.32					0.32							
	Power sprayer	0.32					0.32							
Plowing	Tractor	4.30					2.15	2.15						
	Bottom plow	4.30					2.15	2.15						
Puddling	Tractor	5.30						5.30						
	Drive harrow	5.30						5.30						
Fertilization 1)	Tractor	0.58						0.58						
	Broadcaster	0.58						0.58						
Weed control 2)	Tractor	5.06						2.53	2.53					
	Power sprayer	5.06						2.53	2.53					
Pest insects control	Tractor	7.59							3.04	3.04	1.51			
	Power sprayer	7.59							3.04	3.04	1.51			
Diseas control	Tractor	7.59							3.04	3.04	1.51			
	Power sprayer	7.59							3.04	3.04	1.51			
Harvesting & threshing	Combine	4.60											4.60	
Grains transporting	Tractor	6.25											6.25	
	Trailer	6.25											6.25	
Straw transporting	Tractor	12.50											12.50	
	Trailer	12.50											12.50	

Notes: <sup>1/</sup> For transplanting method.

<sup>2/</sup> For nursery operations

Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Rice <sup>1/</sup> (A-1)

<u>Machinery or implements</u>	<u>Monthly operation hours (hours/ha)</u>												
	<u>Total</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>Apr.</u>	<u>May</u>	<u>Jun.</u>	<u>Jul.</u>	<u>Aug.</u>	<u>Sep.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>
Tractor	51.40				0.27	4.11	10.56	8.61	6.08	3.02	18.75		
Bottom plow	4.84				0.27	2.42	2.15						
Drive harrow	5.96					0.66	5.30						
Broadcaster	0.65					0.07	0.58						
Power sprayer	21.20					0.96	2.53	8.61	6.08	3.02			
Trailer	18.75										18.75		
Combine	4.60												4.60

Note: <sup>1/</sup> For transplanting method

Appendix D-2-17 Monthly Operation Hours of Machinery & Implements for Rice  
by Farming Operation Items <sup>1/</sup> (A-2)

Farming operation items	Machinery or implements	Total	Monthly operation hours (hours/ha)													
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
Plowing <sup>2/</sup>	Tractor	0.54				0.27	0.27									
	Bottom plow	0.54				0.27	0.27									
Puddling <sup>2/</sup>	Tractor	0.66					0.66									
	Drive harrow	0.66					0.66									
Seeding <sup>2/</sup>	Tractor	0.07					0.07									
	Broadcaster	0.07					0.07									
Weed control <sup>2/</sup>	Tractor	0.32					0.32									
	Power sprayer	0.32					0.32									
Pest insects control <sup>2/</sup>	Tractor	0.32					0.32									
	Power sprayer	0.32					0.32									
Disease control <sup>2/</sup>	Tractor	0.32					0.32									
	Power sprayer	0.32					0.32									
Plowing	Tractor	4.30					2.15	2.15								
	Bottom plow	4.30					2.15	2.15								
Puddling	Tractor	5.30						5.30								
	Drive harrow	5.30						5.30								
Fertilization 1)	Tractor	0.58						0.58								
	Broadcaster	0.58						0.58								
Weed control 2)	Tractor	5.06						2.53	2.53							
	Power sprayer	5.06						2.53	2.53							
Pest insects control	Tractor	7.59							3.04	3.04	1.51					
	Power sprayer	7.59							3.04	3.04	1.51					
Disease control	Tractor	7.59							3.04	3.04	1.51					
	Power sprayer	7.59							3.04	3.04	1.51					
Harvesting	Sickle	150.00														150.00
Threshing	Thresher	12.50														12.50
	Tractor	6.25														6.25
Grains transporting	Trailer	6.25														6.25
	Tractor	12.50														12.50
Straw transporting	Trailer	12.50														12.50

Notes: <sup>1/</sup> For transplanting method

<sup>2/</sup> For nursery operations

Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Rice <sup>1/</sup> (A-2)

Machinery or implements	Monthly operation hours (hours/ha)												
	Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tractor	51.40				0.27	4.11	10.56	8.61	6.08	3.02	18.75		
Bottom plow	4.84				0.27	2.42	2.15						
Drive harrow	5.96					0.66	5.30						
Broadcaster	0.65					0.07	0.58						
Power sprayer	21.20					0.96	2.53	8.61	6.08	3.02			
Trailer	18.75										18.75		
Sickle	150.00										150.00		
Thresher	12.50										12.50		

Note: <sup>1/</sup> For transplanting method

## Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Cotton  
by Farming Operation Items

Farming operation items	Machinery or implements	Monthly operation hours (hours/ha)															
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
Fertilization 1)	Tractor	0.58			0.58												
	Broadcaster	0.58			0.58												
Plowing	Tractor	4.30			4.30												
	Bottom plow	4.30			4.30												
Harrowing	Tractor	3.54			3.54												
	Disk harrow	3.54			3.54												
Ridging & seeding	Tractor	12.82			8.54	4.28											
	Seeder with ridger	12.82			8.54	4.28											
Weed control	Tractor	2.53			2.53												
	Power sprayer	2.53			2.53												
Pest insects control	Tractor	5.06					1.27	2.53	1.26								
	Power sprayer	5.06					1.27	2.53	1.26								
Disease control	Tractor	5.06				1.26	1.27	1.26	1.27								
	Power sprayer	5.06				1.26	1.27	1.26	1.27								
Transporting	Tractor	6.25								1.56	4.69						
	Trailer	6.25								1.56	4.69						

Appendix D-2-17 Monthly Operation Hours of Machinery & Implements for Cotton

Machinery or implements	Monthly operation hours (hours/ha)												
	Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tractor	40.14			19.49	5.54	2.54	3.79	2.53	1.56	4.69			
Broadcaster	0.58			0.58									
Bottom plow	4.30			4.30									
Disk harrow	3.54			3.54									
Seeder with ridger	12.82			8.54	4.28								
Power sprayer	12.65			2.53	1.26	2.54	3.79	2.53					
Trailer	6.25								1.56	4.69			



Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for  
Full-term Berseem by Farming Operation Items

Farming operation items	Machinery or implements	Monthly operation hours (hours/ha)												
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Fertilization 1)	Tractor	0.58										0.19	0.39	
	Broadcaster	0.58										0.19	0.39	
Fertilization 2)	Tractor	0.58												0.58
	Broadcaster	0.58												0.58
Fertilization 3)	Tractor	0.58	0.39	0.19										
	Broadcaster	0.58	0.39	0.19										
Pest insects control	Tractor	7.59	0.84	1.69								0.84	2.53	1.69
	Power sprayer	7.59	0.84	1.69								0.84	2.53	1.69
Disease control	Tractor	5.06												
	Power sprayer	5.06												
Harvesting	Tractor	17.25	2.88	2.87	2.88	4.31								4.31
	Reciprocating mower	17.25	2.88	2.87	2.88	4.31								4.31
Transporting	Tractor	15.00	2.50	2.50	2.50	3.75								3.75
	Trailer	15.00	2.50	2.50	2.50	3.75								3.75

Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Full-term Berseem

Machinery or implements	Monthly operation hours (hours/ha)												
	<u>Total</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>Apr.</u>	<u>May</u>	<u>Jun.</u>	<u>Jul.</u>	<u>Aug.</u>	<u>Sep.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>
Tractor	46.64	6.61	7.25	5.38	8.06						1.87	5.45	12.02
Broadcaster	1.74	0.39	0.19								0.19	0.39	0.58
Power sprayer	12.65	0.84	1.69								1.68	5.06	3.38
Trailer	15.00	2.50	2.50	2.50	3.75								3.75
Reciprocating mower	17.25	2.88	2.87	2.88	4.31								4.31

Appendix D-2-17

Monthly operation Hours of Machinery & Implements for  
Catch-cropping Berseem by Farming Operation Items

Farming operation items	Machinery or implements	Monthly operation hours (hours/ha)														
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
Plowing	Tractor	4.30											2.15	2.15		
	Bottom plow	4.30											2.15	2.15		
Harrowing	Tractor	3.54											1.77	1.77		
	Disk harrow	3.54											1.77	1.77		
Levelling	Tractor	2.27											1.14	1.13		
	Tooth harrow	2.27											1.14	1.13		
Seeding	Tractor	0.58											0.19	0.39		
	Broadcaster	0.58											0.19	0.39		
Fertilization 1)	Tractor	0.58											0.19	0.39		
	Broadcaster	0.58											0.19	0.39		
Fertilization 2)	Tractor	0.58														0.58
	Broadcaster	0.58														0.58
Pest insects control	Tractor	5.06											0.84	2.53	1.69	
	Power sprayer	5.06											0.84	2.53	1.69	
Disease control	Tractor	5.06											0.84	2.53	1.69	
	Power sprayer	5.06											0.84	2.53	1.69	
Harvesting	Tractor	8.63	2.88	1.43												4.32
	Reciprocating mower	8.63	2.88	1.43												4.32
Transporting	Tractor	7.50	2.50	1.25												3.75
	Trailer	7.50	2.50	1.25												3.75

Appendix D-2-19

Monthly Operation Hours of Machinery & Implements for Catch-cropping Berseem

Machinery or implements	Monthly operation hours (hours/ha)												
	Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tractor	38.10	5.38	2.68							5.25	7.31	5.45	12.03
Bottom plow	4.30									2.15	2.15		
Disk harrow	3.54									1.77	1.77		
Tooth harrow	2.27									1.14	1.13		
Broadcaster	1.74									0.19	0.58	0.39	0.58
Power sprayer	10.12										1.68	5.06	3.38
Trailer	7.50	2.50	1.25										3.75
Reciprocating mower	8.63	2.88	1.43										4.32

## Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for  
Wheat by Farming Operation Items (A-1)

Farming operation items	Machinery or implements	Monthly operation hours (hours/ha)												
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Plowing	Tractor	4.30												4.30
	Bottom plow	4.30												4.30
Harrowing	Tractor	3.54												3.54
	Disk harrow	3.54												3.54
Levelling	Tractor	2.27												2.27
	Tooth harrow	2.27												2.27
Seeding	Tractor	0.58												0.39 0.19
	Broadcaster	0.58												0.39 0.19
Weed control	Tractor	2.53												1.69 0.84
	Power sprayer	2.53												1.69 0.84
Pest insects control	Tractor	5.06	0.84	2.53										1.69
	Power sprayer	5.06	0.84	2.53										1.69
Disease control	Tractor	5.06	0.84	2.53										1.69
	Power sprayer	5.06	0.84	2.53										1.69
Harvesting & threshing	Combine	4.6											2.30	2.30
	Tractor	6.25											3.12	3.13
Grains transporting	Trailer	6.25											3.12	3.13
	Tractor	12.50											6.25	6.25
Straw transporting	Tractor	12.50											6.25	6.25
	Trailer	12.50											6.25	6.25

Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Wheat (A-1)

Machinery or implements	Monthly operation hours (hours/ha)												
	Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tractor	42.09	1.68	5.06		9.37	9.38						12.19	4.41
Bottom plow	4.30											4.30	
Disk harrow	3.54											3.54	
Tooth harrow	2.27											2.27	
Broadcaster	0.58											0.39	0.19
Power sprayer	12.65	1.68	5.06									1.69	4.22
Combine	4.60								2.30	2.30			
Trailer	18.75				9.37	9.38							

Appendix D-2-17 Monthly Operation Hours of Machinery & Implements for Wheat  
by Farming Operation Items (A-2)

Farming operation items	Machinery or implements	Monthly operation hours ( hours/ha)														
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
Plowing	Tractor	4.30													4.30	
	Bottom plow	4.30													4.30	
Harroiwng	Tractor	3.54													3.54	
	Disk harrow	3.54													3.54	
Levelling	Tractor	2.27													2.27	
	Tooth harrow	2.27													2.27	
Seeding	Tractor	0.58													0.39	0.19
	Broadcaster	0.58													0.39	0.19
Weed control	Tractor	2.53													1.69	0.84
	Power sprayer	2.53													1.69	0.84
Pest insects control	Tractor	5.06	0.84	2.53											1.69	1.69
	Power sprayer	5.06	0.84	2.53											1.69	1.69
Disease control	Tractor	5.06	0.84	2.53											1.69	1.69
	Power sprayer	5.06	0.84	2.53											1.69	1.69
Harvesting	Sickle	150.00								75.00	75.00					
	Thresher	11.10								5.55	5.55					
Grains transporting	Tractor	6.25								3.12	3.13					
	Trailer	6.25								3.12	3.13					
Straw transporting	Tractor	12.50								6.25	6.25					
	Trailer	12.50								6.25	6.25					

Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Wheat (A-2)

Machinery or implements	Monthly operation hours (hours/ha)												
	Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tractor	42.09	1.68	5.06		9.37	9.38						12.19	4.41
Bottom plow	4.30											4.30	
Disk harrow	3.54											3.54	
Tooth harrow	2.27											2.27	
Broadcaster	0.58											0.39	0.19
Power sprayer	12.65	1.68	5.06									1.69	4.22
Trailer	18.75				9.37	9.38							
Thresher	11.10				5.55	5.55							
Sickle	150.00				75.00	75.00							



## Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Maize  
by Farming Operation Items

Farming operation items	Machinery or implements	Monthly operation hours (hours/ha)															
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
Plowing	Tractor	4.30				0.72	3.58										
	Bottom plow	4.30				0.72	3.58										
Harrowing	Tractor	3.54				0.59	2.95										
	Disk harrow	3.54				0.59	2.95										
Ridging & seeding	Tractor	12.82					2.14	10.68									
	Seeder with ridger	12.82					2.14	10.68									
Weed control	Tractor	2.53					0.42	2.11									
	Power sprayer	2.53					0.42	2.11									
Pest insects control	Tractor	5.06					0.42	2.53	2.11								
	Power sprayer	5.06					0.42	2.53	2.11								
Disease control	Tractor	5.06					0.42	2.53	2.11								
	Power sprayer	5.06					0.42	2.53	2.11								
Transporting	Tractor	15.00												10.00	5.00		
	Trailer	15.00												10.00	5.00		
Shelling	Corn-sheller	2.50												1.67	0.83		

Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Maize

<u>Machinery or implements</u>	<u>Monthly operation hours (hours/ha)</u>												
	<u>Total</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>Apr.</u>	<u>May</u>	<u>Jun.</u>	<u>Jul.</u>	<u>Aug.</u>	<u>Sep.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>
Tractor	48.31				1.31	9.09	13.63	5.06	4.22	10.00	5.00		
Bottom plow	4.30				0.72	3.58							
Disk harrow	3.54				0.59	2.95							
Seeder with ridger	12.82					2.14	10.68						
Power sprayer	12.65					0.42	2.95	5.06	4.22				
Trailer	15.00									10.00	5.00		
Corn-sheller	2.50									1.67	0.83		

## Appendix D-2-17

Monthly Operation Hours of Machinery & Implements for Green Fodder Maize  
by Farming Operation Items

Farming operation items	Machinery or implements	Monthly operation hours (hours/ha)															
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
Plowing	Tractor	4.30				1.08	2.15	1.07									
	Bottom plow	4.30				1.08	2.15	1.07									
Harrowing	Tractor	3.54				0.89	1.77	0.88									
	Disk harrow	3.54				0.89	1.77	0.88									
Ridging & Seeding	Tractor	12.82						6.41	6.41								
	Seeder with ridger	12.82						6.41	6.41								
Weed control	Tractor	2.53						1.27	1.26								
	Power sprayer	2.53						1.27	1.26								
Pest insects control	Tractor	2.53						1.27	1.26								
	Power sprayer	2.53						1.27	1.26								
Disease control	Tractor	2.53						1.27	1.26								
	Power sprayer	2.53						1.27	1.26								
Harvesting	Tractor	4.31															4.31
	Corn harvester	4.31															4.31
Transporting	Tractor	15.00															15.00
	Trailer	15.00															15.00

Appendix D-2-17 Monthly Operation Hours of Machinery & Implements for Green Fodder Maize

Machinery or implements	Monthly operation hours (hours/ha)												
	Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tractor	47.56				1.97	3.92	9.63	10.21	2.52	19.31			
Bottom plow	4.30				1.08	2.15	1.07						
Disk harrow	3.54				0.89	1.77	0.88						
Seeder with ridger	12.82						6.41	6.41					
Power sprayer	7.59					1.27	3.80	2.52					
Corn harvester	4.31									4.31			
Trailer	15.00												15.00

## Monthly Labour Requirements for Rice 1/ (A-1)

Farming operation items	Ope. period	Total	Monthly labour requirements (man-hours/ha)														
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
Seed preparation	Apr. 20 - May 5	15.00				10.00	5.00										
Plowing	Apr. 20 - May 20	4.30				1.43	2.87										
Puddling	May 1 - May 31	5.30					5.30										
Pre-germinating	May 1 - May 31	5.00					5.00										
Seeding	May 1 - May 31	0.58					0.58										
Fertilization 1)	Jun. 1 - Jun. 30	6.20							6.20								
Fertilization 2)	Jun. 15 - Jul. 15	6.20							3.10	3.10							
Irrigation management	whole season	144.00							8.20	24.70	24.70	24.70	24.70	24.70	12.30		
Weed control 1)	May 15 - Jul. 31	30.00							6.00	12.00	12.00						
Weed control 2)	May 15 - Jul. 25	25.30							5.50	10.80	9.00						
Pest insects control	Jul. 1 - Sep. 15	38.00									15.20	15.20	7.60				
Disease control	Jul. 1 - Sep. 15	38.00									15.20	15.20	7.60				
Harvesting & threshing	Oct. 1 - Oct. 31	9.20												9.20			
Grains transporting	Oct. 1 - Oct. 31	12.50												12.50			
Straw transporting	Oct. 1 - Oct. 31	25.00												25.00			
Grains drying	Oct. 1 - Oct. 31	30.00												30.00			
<u>Total</u>		<u>394.58</u>							19.63	54.95	56.80	79.20	55.10	39.90	89.00		

Note: 1/ For direct seeding method

## Monthly Labour Requirements for Rice 1/ (A-2)

Farming operation items	Opn. period	Monthly labour requirements (man-hours/ha)															
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
Seed preparation	Apr.20 - May 5	15.00				10.00	5.00										
Plowing	Apr.20 - May 20	4.30				1.43	2.87										
Puddling	May 1 - May 31	5.30					5.30										
Pre-germinating	May 1 - May 31	5.00					5.00										
Seeding	May 1 - May 31	0.58					0.58										
Fertilization 1)	Jun. 1 - Jun.30	6.20						6.20									
Fertilization 2)	Jun.15 - Jul.15	6.20						3.10	3.10								
Irrigation management	whole season	144.00				8.20	24.70	24.70	24.70	24.70	24.70	24.70	12.30				
Weed control 1)	May 15 - Jul.31	30.00					6.00	12.00	12.00								
Weed control 2)	May 15 - Jul.25	25.30					5.50	10.80	9.00								
Pest insects control	Jul. 1 - Sep.15	38.00							15.20	15.20	7.60						
Disease control	Jul. 1 - Sep.15	38.00							15.20	15.20	7.60						
Harvesting	Oct. 1 - Oct.31	150.00											150.00				
Stacking & drying	Oct. 1 - Oct.31	30.00											30.00				
Threshing	Oct. 1 - Oct.31	50.00											50.00				
Grains transporting	Oct. 1 - Oct.31	12.50											12.50				
Straw Transporting	Oct. 1 - Oct.31	25.00											25.00				
Grains drying	Oct. 1 - Oct.31	30.00											30.00				
<b>Total</b>		<b>615.38</b>				<b>19.63</b>	<b>54.95</b>	<b>56.80</b>	<b>79.20</b>	<b>55.10</b>	<b>39.90</b>	<b>309.80</b>					

Note: 1/ For direct seeding method

Appendix D-2-18 Monthly Labour Requirements for Rice <sup>1/</sup> (A-1)

Farming operation items	Ope. period	Total	Monthly labour requirements (man-hours/ha)														
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
Seed preparation	Apr.20 - May 5	15.00				10.00	5.00										
Plowing <sup>2/</sup>	Apr.20 - May 10	0.54				0.27	0.27										
Puddling <sup>2/</sup>	May 1 - May 20	0.66					0.66										
Pre-germinating	May 1 - May 20	5.00					5.00										
Seeding <sup>2/</sup>	May 1 - May 20	0.07					0.07										
Fertilization <sup>2/</sup>	May 15 - Jun. 5	0.78					0.58	0.20									
Irrigation management <sup>2/</sup>	May 1 - Jun.30	3.63					1.82	1.81									
Weed control <sup>2/</sup>	May 12 - May 31	1.58					1.58										
Pest insects control <sup>2/</sup>	May 12 - May 31	1.58					1.58										
Disease control <sup>2/</sup>	May 12 - May 31	1.58					1.58										
Plowing	May 15 - Jun.15	4.30					2.15	2.15									
Puddling	Jun. 1 - Jun.30	5.30						5.30									
Seedling collection & Transporting, Transplanting	Jun. 1 - Jun.30	260.00						260.00									
Fertilization 1)	Jun. 1 - Jun.30	0.58						0.58									
Fertilization 2)	Jun.15 - Jul.15	6.20						3.10	3.10								
Irrigation management	whole season	115.00						25.50	25.50	25.50	25.50	13.00					
Weed control 1)	Jun.15 - Jul.31	30.00						10.00	20.00								
Weed control 2)	Jun. 6 - Jul.25	25.30						12.65	12.65								
Pest insects control	Jul. 1 - Sep.15	38.00							15.18	15.18	7.64						
Disease control	Jul. 1 - Sep.15	38.00							15.18	15.18	7.64						
Harvesting & threshing	Oct. 1 - Oct.31	9.20													9.20		
Grains transporting	Oct. 1 - Oct.31	12.50													12.50		
Straw transporting	Oct. 1 - Oct.31	25.00													25.00		
Grains drying	Oct. 1 - Oct.31	30.00													30.00		
<u>Total</u>		<u>629.80</u>					10.27	20.29	321.29	91.61	55.86	40.78	89.70				

Note: <sup>1/</sup> For transplanting method

<sup>2/</sup> For nursery operations

Appendix D-2-18 Monthly Labour Requirements for Rice <sup>1/</sup> (A-2)

Farming operation items	Ope. period	Total	Monthly labour requirements (man-hours/ha)													
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
Seed preparation	Apr.20 - May 5	15.00				10.00	5.00									
Plowing <sup>2/</sup>	Apr.20 - May 10	0.54				0.27	0.27									
Puddling <sup>2/</sup>	May 1 - May 20	0.66					0.66									
Pre-germinating	May 1 - May 20	5.00					5.00									
Seeding <sup>2/</sup>	May 1 - May 20	0.07					0.07									
Fertilization <sup>2/</sup>	May 15 - Jun. 5	0.78					0.58	0.20								
Irrigation management <sup>2/</sup>	May 1 - Jun.30	3.63					1.82	1.81								
Weed control <sup>2/</sup>	May 12 - May 31	1.58					1.58									
Pest insects control <sup>2/</sup>	May 12 - May 31	1.58					1.58									
Disease control <sup>2/</sup>	May 12 - May 31	1.58					1.58									
Plowing	May 15 - Jun.15	4.30					2.15	2.15								
Puddling	Jul. 1 - Jun.30	5.30						5.30								
Seedling collection & Transporting, transplanting	Jun. 1 - Jun.30	260.00						260.00								
Fertilization 1)	Jun. 1 - Jun.30	0.58						0.58								
Fertilization 2)	Jun.15 - Jul.15	6.20						3.10	3.10							
Irrigation management	whole season	115.00						25.50	25.50	25.50	25.50	13.00				
Weed control 1)	Jun.15 - Jul.31	30.00						10.00	20.00							
Weed control 2)	Jun. 6 - Jul.25	25.30						12.65	12.65							
Pest insects control	Jul. 1 - Sep.15	38.00						15.18	15.18	7.64						
Disease control	Jul. 1 - Sep.15	38.00						15.18	15.18	7.64						
Harvesting	Oct. 1 - Oct.31	150.00												150.00		
Stacking & drying	Oct. 1 - Oct.31	30.00												30.00		
Threshing	Oct. 1 - Oct.31	50.00												50.00		
Grains transporting	Oct. 1 - Oct.31	12.50												12.50		
Straw transporting	Oct. 1 - Oct.31	25.00												25.00		
Grains drying	Oct. 1 - Oct.31	30.00												30.00		
<b>Total</b>		<b>850.60</b>					<b>10.27</b>	<b>20.29</b>	<b>321.29</b>	<b>91.61</b>	<b>55.86</b>	<b>40.78</b>	<b>310.50</b>			

Notes : <sup>1/</sup> For transplanting method      <sup>2/</sup> For nursery operations



Farming operation itemsMonthly labour requirements (man-hours/ha)

	<u>Op.e. period</u>	<u>Total</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>Apr.</u>	<u>May</u>	<u>Jun.</u>	<u>Jul.</u>	<u>Aug.</u>	<u>Sep.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>
Seed preparation	Sep.15 - Sep.30	2.50									2.50			
Seeding	Sep.20 - Oct.20	6.20									2.10	4.10		
Fertilization 1)	Oct.20 - Nov.20	0.58										0.19	0.39	
Fertilization 2)	Dec. 1 - Dec.31	0.58												0.58
Fertilization 3)	Jan.10 - Feb.10	0.58	0.39	0.19										
Irrigation management	whole season	57.00	7.60	7.60	7.60	7.60	7.60				3.80	7.60	7.60	7.60
Pest insects control	Oct.20 - Nov.20	38.00	4.22	8.43								4.22	12.70	8.43
	Nov.20 - Dec.20	25.30										4.22	12.64	8.44
Disease control	Dec. 1 - Dec.31	17.25	2.88	2.87	2.88	4.31								4.31
Harvesting	Jan.10 - Feb.10													
	Feb.20 - Mar.20													
	Apr. 1 - Apr.30													
Transporting	Dec. 1 - Dec.31	30.00	5.00	5.00	5.00	7.50								7.50
	Jan.10 - Feb.10													
	Feb.20 - Mar.20													
	Apr. 1 - Apr.30													
<u>Total</u>		<u>177.99</u>	<u>20.09</u>	<u>24.09</u>	<u>15.48</u>	<u>19.41</u>					<u>8.40</u>	<u>20.33</u>	<u>33.33</u>	<u>36.86</u>

Appendix D-2-18 Monthly Labour Requirements for Catch-cropping Berseem

Farming operation items	Monthly labour requirements (man-hours/ha)												
	Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Seed preparation										2.50			
Plowing	2.50									2.15	2.15		
Harrowing	4.30									1.77	1.77		
Levelling	3.54									1.14	1.13		
Seeding	2.27									0.19	0.39		
Fertilization 1)	0.58									0.19	0.39		
Fertilization 2)	0.58											0.58	
Irrigation management	36.70	7.60	2.50							3.8	7.60	7.60	7.60
Pest insects control	25.30									4.22	12.65	8.43	
Disease control	25.30									4.22	12.65	8.43	
Harvesting	8.63	2.87	1.44									4.32	
Transporting	15.00	5.00	2.50										7.50
<u>Total</u>	<u>125.28</u>	<u>15.47</u>	<u>6.44</u>							<u>11.55</u>	<u>21.67</u>	<u>33.29</u>	<u>36.86</u>

Farming operation items	Opn. period	Monthly labour requirements (man-hours/ha)															
		Total	Jan. Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.				
Seed preparation	Mar. 1 - Mar.15	2.50		2.50													
Fertilization 1)	Mar. 1 - Mar.31	0.58		0.58													
Plowing	Mar. 1 - Mar.31	4.30		4.30													
Harrowing	Mar. 1 - Mar.31	3.54		3.54													
Ridging & seeding	Mar.10 - Apr.10	25.63		17.00	8.63												
Thinning	Apr.20 - May 20	57.00			19.00	38.00											
Fertilization 2)	Apr.20 - May 20	28.50			9.50	19.00											
Fertilization 3)	May 3 - May 31	28.50				28.50											
Irrigation management	whole season	84.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00			
Weed control	Mar. 1 - Mar.31	12.66			12.66												
Pest insects control 1)	Apr.15 - May 15	430.00			215.00	215.00											
Pest insects control 2)	May 15 - Jun.15	25.30				6.00	13.30	6.00									
	Jun.15 - Jul.15																
Disease control	Apr.15 - May 15	25.30			6.32	6.33	6.32	6.33									
	Jun.15 - Jul.15																
Harvesting <sup>1/</sup>	Aug.20 - Sep.30	630.00											157.50	472.50			
Transporting <sup>2/</sup>	Aug.20 - Sep.30	12.50											3.13	9.37			
<b>Total</b>		<b>1,370.31</b>			<b>52.58</b>	<b>270.45</b>	<b>324.83</b>	<b>31.62</b>	<b>24.33</b>	<b>172.63</b>	<b>493.87</b>						

Notes: 1/ Seed cotton picking and plant bodies removing

2/ For seed cotton and plant bodies

Appendix D-2-18 Monthly Labour Requirements for Wheat (A-1)

Farming operation items	Ope. period	Monthly labour requirements (man-hours/ha)															
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
Seed preparation	Nov. 1 - Nov.15	2.50															2.50
Plowing	Nov. 1 - Nov.30	4.30															4.30
Harrowing	Nov. 1 - Nov.30	3.54															3.54
Levelling	Nov. 1 - Nov.30	2.27															2.27
Seeding	Nov.10 - Dec.10	0.58															0.58
Fertilization	Dec.20 - Jan.20	6.20	4.13														4.13
Irrigation management	whole season	57.00	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76
Weed control	Dec.10 - Jan 10	12.70	4.22														4.22
Pest insects control	Dec.10 - Jan.10	25.30	4.22	12.65													4.22
Disease control	Dec.10 - Jan.10	25.30	4.22	12.65													4.22
Harvesting & threshing	Apr.15 - May 15	9.20				4.60	4.60										4.60
Grains transporting	Apr.15 - May 15	12.50				6.25	6.25										6.25
Straw transporting	Apr.15 - May 15	25.00				12.50	12.50										12.50
Grains drying	Apr.15 - May 15	30.00				15.00	15.00										15.00
<u>Total</u>		<u>216.39</u>	<u>25.55</u>	<u>34.06</u>	<u>8.76</u>	<u>47.11</u>	<u>42.79</u>										<u>21.76</u>

Appendix D-2-18 Monthly Labour Requirements for Wheat (A-2)

Farming operation items	Ope. period	Monthly labour requirements (man-hours/hs)															
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
Seed preparation	Nov. 1 - Nov.15	2.50															2.50
Plowing	Nov. 1 - Nov.30	4.30															4.30
Harrowing	Nov. 1 - Nov.30	3.54															3.54
Levelling	Nov. 1 - Nov.30	2.27															2.27
Seeding	Nov.10 - Dec.10	0.58															0.39
Fertilization	Dec.20 - Jan.20	6.20	4.13														2.07
Irrigation management	Whole season	57.00	8.76	8.76	8.76	8.76	8.76	8.76	8.76	4.44							8.76
Weed control	Dec.10 - Jan.10	12.70	4.22														8.48
Pest insects control	Dec.10 - Jan.10 Feb. 1 - Feb.28	25.30	4.22	12.65													8.43
Disease control	Dec.10 - Jan.10 Feb. 1 - Feb.28	25.30	4.22	12.65													8.43
Harvesting	Apr.15 - May 15	150.00						75.00	75.00								
Stacking & drying	Apr.15 - May 15	30.00						15.00	15.00								
Threshing	Apr.15 - May 15	44.40						22.20	22.20								
Grains transporting	Apr.15 - May 15	12.50						6.25	6.25								
Straw transporting	Apr.15 - May 15	25.00						12.50	12.50								
Grains drying	Apr.15 - May 15	30.00						15.00	15.00								
<u>Total</u>		<u>431.59</u>	<u>25.55</u>	<u>34.06</u>	<u>8.76</u>	<u>154.71</u>	<u>150.39</u>										<u>21.76</u>

Farming operation items	Ope. period	Monthly labour requirements (man-hours/ha)															
		Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			
Seed preparation	Apr.25 - May 25	2.50				0.42	2.08										
Plowing	Apr.25 - May 25	4.30				0.72	3.58										
Harrowing	Apr.25 - May 25	3.54				0.59	2.95										
Ridging & Seeding	May 25 - Jun.25	25.63					4.27	21.36									
Thinning	Jun.25 - Jul.25	29.00					4.83	24.17									
Fertilization 1)	Jul. 5 - Aug. 5	38.00						31.67	6.33								
Fertilization 2)	Jul.20 - Aug.20	38.00						12.67	25.33								
Irrigation management	whole season	190.00				5.80	34.50	34.50	34.50	34.50	34.50	34.50	34.50	11.70			
Weed control	May 25 - Jun.25	12.70					2.12	10.58									
Pest insects control	Jun.25 - Jul.25	25.30						2.11	12.65	10.54							
	Jul.25 - Aug.25							2.11	12.65	10.54							
Disease control	Jun.25 - Jul.25	25.30															
	Jul.25 - Aug.25																
Harvesting <sup>1/</sup>	Sep.10 - Aug.10	95.00												63.33	31.67		
Transporting <sup>2/</sup>	Sep.10 - Oct.10	30.00												20.00	10.00		
Husking & drying	Sep.10 - Oct.10	90.00												60.00	30.00		
Shelling	Sep.10 - Oct.10	5.00												3.33	1.67		
<b>Total</b>		<b>614.27</b>				<b>7.53</b>	<b>49.50</b>	<b>75.49</b>	<b>128.31</b>	<b>87.24</b>	<b>181.16</b>	<b>85.04</b>					

Notes : 1/ Corn harvesting and plant bodies removing

2/ For corns and plant bodies

Farming operation items	Monthly Labour requirements (man-hours/ha)													
	Op. period	Total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Seed preparation	Apr.15-May 15	2.50				1.25	1.25							
Plowing	Apr.15-Jun.15	4.30				1.08	2.15	1.07						
Harrowing	Apr.15-Jun.15	3.54				0.89	1.77	0.88						
Ridging & Seeding	Jun.15-Jul.15	25.63						12.82	12.81					
Fertilization 1)	Jul.15-Aug.15	38.00							19.00	19.00				
Fertilization 2)	Aug.10-Sep.10	38.00								12.67	25.33			
Irrigation management	whole season	140.00						20.00	40.00	40.00	40.00	40.00		
Weed control	Jun.15-Jul.15	12.70						6.35	6.35					
Pest insects control	Jul.15-Aug.15	12.70							6.35	6.35				
Disease control	Jul.15-Aug.15	12.70							6.35	6.35				
Harvesting	Sep. 1-Sep.30	4.31										4.31		
Transporting	Sep. 1-Sep.30	30.00											30.00	
<u>Total</u>		<u>324.38</u>				3.22	5.17	41.12	90.86	84.37	99.64			











