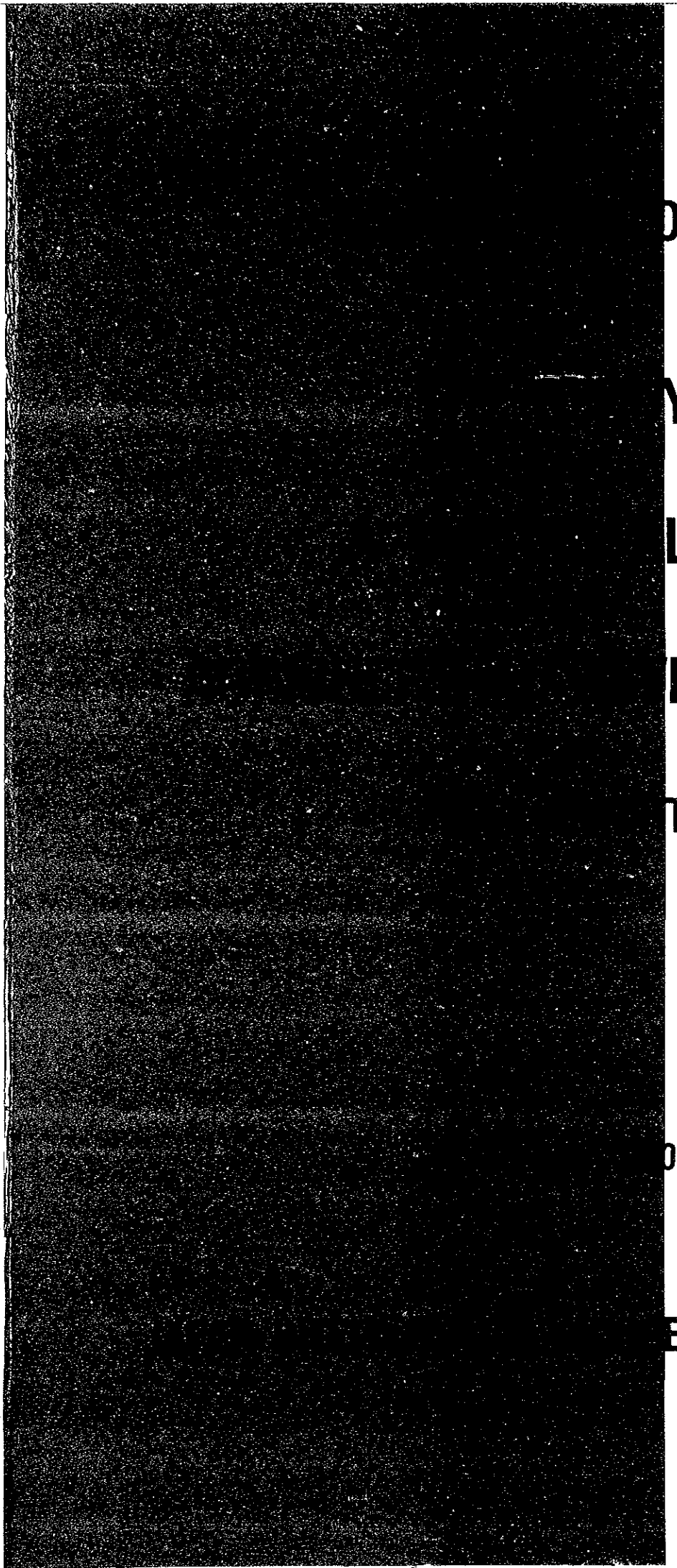
SULTANATE OF OMAN THE STUDY ON A MASTER PLAN FOR AGRICULTURAL DEVELOPMENT FINAL REPORT VOLUME 5 APPENDIX



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NOVEMBER

SULTANATE OF OMAN

THE STUDY ON A MASTER PLAN FOR AGRICULTURAL DEVELOPMENT

FINAL REPORT

VOLUME 5
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NOVEMBER 1990

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CHAPTER 1

GDP FORECAST

CHAPTER 1 GDP Forecast

1.1 General

Gross Domestic Product (GDP) in the agricultural sector is defined as the total added value generated by domestic farm production activity over a given period (usually 1 year). The value added is the remainder after subtracting the value of intermediate consumption from other sectors such as fertilizer, agro-chemicals, fuel, etc., from the gross production value of the agricultural sector.

Thus, in terms of production, GDP is calculated as follows:

GDP = gross production - intermediate consumption

In terms of allocation, GDP is computed as follows:

GDP = compensation to employees + consumption of fixed capital
+ operating surplus + indirect tax - subsidies

The figure for GDP can also be generated from expenditures such as consumption, investment, etc. The GDP can be computed from each of the approaches above and the result of computation is always equal.

In calculating GDP in terms of production, the following conditions are assumed:

(1) Production is calculated crop-wise, and the sum of these sub-totals is considered to be production for the entire sector.
(2) Intermediate consumption comprises fertilizer, agro-chemicals, seed, imported feed, vaccines, etc.
(3) Items under intermediate consumption which are unclear are grouped under "others" and included at a fixed percentage. In determining this percentage, the coefficient applied is such that the calculated figure for the base year (1988) matches that in statistics published by the Development Council.
(4) Subsidies for production inputs are considered minor enough to be

disregarded.

The procedure followed by the team in calculating GDP was as follows:

(1) On the basis of forecast supply and demand for farm products, the following were calculated year-wise for 1988-2000: crop production, cropped area, livestock production, crop production value, and livestock production value. Increase ratios for the foregoing are separate constant values applied to each of the two periods 1988-1995, and 1995-2000.

(2) Crop-wise intermediate consumption per unit area was calculated from current design production cost. For livestock, intermediate consumption per lt of produce was computed.

(3) Crop-wise added value per unit area, and added value per unit weight of produce for each type of animal were computed.

(4) Unit intermediate consumption values and unit added values obtained in (2) and (3) above were multiplied by cropped areas and livestock production amounts, as appropriate, and total year-wise intermediate consumption values and added values determined. Increase ratios for the same were separate constant values applied to each of the two periods 1988-1995, and 1995-2000.

(5) GDP growth rate, crop-wise added value growth rate and intermediate consumption rate were calculated.

1.2 Increase in Farm Production

Farm production increases for the period 1988-2000 were determined so as to avoid surplus. This was done taking into consideration, among others, factors of land and water resources in the Sultanate, forecast increase in crop-wise unit yield and supply and demand forecast. Details are given in the separate section "Prospects for Demand and Production of Agricultural Products."

Regarding supply and demand balance, food self-sufficiency rates of 43.6%, 50.4% and 54.7% were established for the target years of 1988 (present), 1995 (end of the first 5-year period) and 2000 (end of the second 5-year period). Agricultural production, allocation of cropped area, and productivity increases necessary to achieve these targeted self-sufficiency rates were then determined. Year-wise increases in production and cropped area for each farm product were computed as shown in Tables 1.1 - 1.2 (Increases in production only are indicated for livestock).

The production amounts computed as per above were multiplied by 1988 farm gate prices (same as for 1989) to obtain the gross product for the agricultural sector. Results are given in Table 1.3.

1.3 Unit Intermediate Consumption and Unit Value Added

On the basis of estimated production costs in the agricultural sector, current and design intermediate consumption values were calculated. Details are given in Table 1.4. For crops where data was not available, data for a similar crop was applied instead. On the basis of management budget for animal husbandry, intermediate consumption per 1t of produce for livestock production was calculated. Results are given in Table 1.5.

Year-wise intermediate consumptions for unit crop production and unit livestock production are shown in Table 1.6.

Unit added value was calculated from production value and intermediate consumption for each crop and livestock product as shown in Table 1.7.

1.4 GDP Calculation

Tables 1.8 - 1.9 indicate year-wise intermediate consumption and added value obtained by multiplying cropped area and livestock production by the unit intermediate consumption and unit added value.

Computation results from above are collected in Table 1.10.

The Development Council estimates that the ratio of added value to total production value in 1988 is 75%. The JICA team estimate is 69.3%.

As the JICA team adjusted unclear elements in production costs so that the added value figure matched the R.O. 77.8 million set by the Development Council, the gross output figure applied in the added value/gross output value ratio of the JICA team is different than that used by the Development Council. However, the object of calculation is to determine a realistic GDP growth target, and the necessary added value figure to evaluate an appropriate investment frame according to ICOR. Consequently, the difference in gross output figures is not deemed important. It is concluded that the team's computation results, which match the 1988 GDP data by the Development Council, are appropriate.

According to Table 1.9, the average GDP growth rates is 6.1%/year for 1988-2000, 6.7%/year for 1995-2000 and 5.9% for 1995-2000. The added value/gross output ratio drops from 69.3% in 1988 to 60.6% in 2000. As a result, the GDP growth rate falls below the gross output growth rate (7.3%/year for 1988-2000). This is clear if one looks at the yearly trend for production, intermediate consumption and added value indicated in Figure 1.1.

Growth rate for perennial crops for 1988-2000 is 4.4%. That for feed crops is 4.6%, and 4.2% for vegetables. The difference in these rates is minimal, and hence balanced growth can be expected.

It is considered that much latent potential for development in the livestock sub-sector is present, and it is thus expected to grow 11.3% during 1988-2000.

Table 1.1 Production Prospects (1988-2000)

Crop	Production Prospects (t)												
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Date Palm	99,097	102,632	106,293	110,084	114,011	118,077	122,289	126,651	130,129	133,702	137,373	141,145	145,020
Grape	1,500	1,847	2,274	2,800	3,447	4,244	5,225	6,433	6,644	6,863	7,088	7,321	7,562
Banana	22,100	23,084	24,111	25,185	26,306	27,476	28,700	29,977	30,949	31,952	32,987	34,056	35,160
Coconut	5,510	6,272	7,139	8,126	9,249	10,528	11,983	13,640	14,029	14,429	14,841	15,265	15,700
Papaya	3,276	3,177	3,081	2,988	2,897	2,809	2,724	2,642	2,747	2,856	2,970	3,088	3,211
Alfalfa	195,341	203,896	212,826	222,147	231,877	242,032	252,632	263,697	276,137	289,165	302,807	317,093	332,052
Rhodes Grass	293,011	308,741	325,315	342,778	361,179	380,568	400,998	422,524	445,733	470,217	496,046	523,293	552,037
Wheat	702	740	781	824	869	917	967	1,020	1,074	1,131	1,191	1,254	1,320
Sorghum	0	0	0	0	0	0	0	0	0	0	0	0	0
Cowpea	0	0	0	0	0	0	0	0	0	0	0	0	0
Tomato	26,906	27,797	28,716	29,666	30,648	31,662	32,710	33,792	34,131	34,473	34,818	35,167	35,520
Sweet Melon	24,563	26,531	28,656	30,952	33,433	36,111	39,005	42,130	43,085	44,062	45,061	46,082	47,127
Potato	3,500	4,253	5,169	6,282	7,634	9,278	11,275	13,702	14,062	14,432	14,811	15,200	15,600
Carrot	5,998	6,137	6,281	6,427	6,577	6,730	6,887	7,048	7,320	7,604	7,898	8,203	8,520
Garlic	1,200	1,248	1,298	1,351	1,405	1,461	1,520	1,581	1,608	1,636	1,664	1,693	1,722
Cabbage	17,864	18,643	19,456	20,304	21,189	22,113	23,077	24,083	24,918	25,783	26,677	27,603	28,560
Okra	700	706	712	719	725	732	738	745	774	804	836	868	902
Onion	7,672	7,917	8,170	8,431	8,700	8,978	9,265	9,561	10,092	10,653	11,244	11,869	12,528
Cucumber	9,983	10,296	10,619	10,953	11,297	11,651	12,017	12,394	12,776	13,170	13,575	13,994	14,425
Eggplant	7,980	8,327	8,689	9,066	9,460	9,871	10,300	10,748	11,163	11,595	12,043	12,509	12,992
Radish	14,490	15,189	15,922	16,691	17,496	18,340	19,225	20,153	20,929	21,736	22,573	23,443	24,346
Squash	2,986	3,117	3,253	3,396	3,545	3,700	3,862	4,031	4,187	4,349	4,518	4,693	4,875
Cauliflower	2,002	2,020	2,037	2,055	2,074	2,092	2,110	2,129	2,210	2,294	2,381	2,471	2,565
Lime, Lemon	30,960	30,504	30,055	29,613	29,177	28,747	28,324	27,907	28,548	29,205	29,876	30,563	31,265
Mango	7,566	7,894	8,243	8,607	8,987	9,384	9,798	10,231	10,566	10,911	11,269	11,637	12,018
Chilli Pepper	5,490	5,787	6,099	6,428	6,776	7,142	7,527	7,934	8,272	8,625	8,993	9,376	9,776
Tabacco	2,004	2,051	2,099	2,148	2,198	2,249	2,301	2,355	2,403	2,452	2,502	2,553	2,605
Milk													
Mutton													
Beef													
Chicken													
Egg													
Other Vegetables	3,504	3,638	3,777	3,921	4,071	4,226	4,387	4,555	4,787	5,031	5,287	5,557	5,840
Other Tubers	2,402	2,717	3,072	3,474	3,928	4,441	5,022	5,679	5,947	6,227	6,521	6,828	7,150
Other Citrus	0	0	0	0	0	0	0	17,324	17,891	18,477	19,082	19,707	20,352
Other Fruits	2,059	2,706	3,557	4,676	6,147	8,081	10,623	13,964	14,390	14,829	15,282	15,748	16,228
Total	800,360	837,866	877,701	920,090	965,299	1,013,642	1,065,493	1,138,630	1,187,504	1,238,661	1,292,213	1,348,278	1,406,979

Table 1.2 Cultivation Area and Livestock Production Prospects (1988-2000)

Crop	Cultivation Area and Livestock Production Prospects (ha, ton) 1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Date Palm	24,170.0	24,170.0	24,170.0	24,170.0	24,170.0	24,170.0	24,170.0	24,170.0	24,170.0	24,170.0	24,170.0	24,170.0	24,170.0
Grape	100.0	120.6	145.3	175.2	211.2	254.6	306.9	370.0	375.4	381.0	386.6	392.2	398.0
Banana	1,625.0	1,638.1	1,651.3	1,664.6	1,678.1	1,691.6	1,705.2	1,719.0	1,726.7	1,734.5	1,742.3	1,750.1	1,758.0
Coconut	328.0	359.9	394.9	433.3	475.4	521.6	572.3	628.0	628.0	628.0	628.0	628.0	628.0
Papaya	273.0	253.6	235.6	218.9	203.3	188.9	175.5	163.0	164.2	165.4	166.6	167.8	169.0
Alfalfa	5,087.0	5,208.8	5,333.6	5,461.3	5,592.1	5,726.0	5,863.1	6,003.5	6,226.8	6,458.3	6,698.5	6,947.6	7,206.0
Rhodes Grass	5,087.0	5,208.8	5,333.6	5,461.3	5,592.1	5,726.0	5,863.1	6,003.5	6,226.8	6,458.3	6,698.5	6,947.6	7,206.0
Wheat	468.0	472.4	476.9	481.5	486.0	490.6	495.3	500.0	509.6	519.4	529.4	539.6	550.0
Sorghum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cowpea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tomato	1,212.0	1,183.8	1,156.3	1,129.4	1,103.2	1,077.5	1,052.5	1,028.0	998.3	969.5	941.6	914.4	888.0
Sweet Melon	1,875.0	1,887.6	1,900.3	1,913.1	1,925.9	1,938.9	1,951.9	1,965.0	1,981.5	1,998.2	2,015.0	2,031.9	2,049.0
Potato	140.0	167.4	200.1	239.3	286.1	342.1	409.0	489.0	495.0	501.2	507.4	513.6	520.0
Carrot	252.0	252.6	253.1	253.7	254.3	254.9	255.4	256.0	261.4	266.9	272.5	278.2	284.0
Garlic	150.0	147.9	145.9	143.8	141.8	139.9	137.9	136.0	133.3	130.6	128.0	125.5	123.0
Cabbage	770.0	773.5	777.1	780.6	784.2	787.8	791.4	795.0	799.2	803.3	807.5	811.8	816.0
Okra	53.0	50.9	48.9	47.0	45.1	43.3	41.6	40.0	40.2	40.4	40.6	40.8	41.0
Onion	560.0	563.8	567.6	571.4	575.3	579.2	583.1	587.0	607.3	628.4	650.2	672.7	696.0
Cucumber	670.0	658.1	646.4	634.9	623.6	612.6	601.7	591.0	588.2	585.4	582.6	579.8	577.0
Eggplant	420.0	417.2	414.5	411.7	409.0	406.3	403.7	401.0	402.0	403.0	404.0	405.0	406.0
Radish	630.0	631.7	633.4	635.1	636.8	638.5	640.3	642.0	645.2	648.4	651.6	654.8	658.0
Squash	189.0	189.0	189.0	189.0	189.0	189.0	189.0	189.0	190.2	191.4	192.6	193.8	195.0
Cauliflower	220.0	211.7	203.7	196.0	188.6	181.5	174.6	168.0	168.6	169.2	169.8	170.4	171.0
Lime, Lemon	2,400.0	2,287.7	2,180.6	2,078.6	1,981.3	1,888.6	1,800.2	1,716.0	1,710.8	1,705.6	1,700.4	1,695.2	1,690.0
Mango	3,780.0	3,801.8	3,823.7	3,845.7	3,867.8	3,890.1	3,912.5	3,935.0	3,949.1	3,963.2	3,977.4	3,991.7	4,006.0
Chilli Pepper	610.0	608.7	607.4	606.1	604.8	603.6	602.3	601.0	603.0	605.0	607.0	609.0	611.0
Tabacco	409.0	409.0	409.0	409.0	409.0	409.0	409.0	409.0	409.0	409.0	409.0	409.0	409.0
Milk	41,638.0	42,043.7	42,453.3	42,866.9	43,284.5	43,706.2	44,132.0	44,562.0	45,808.1	47,089.1	48,405.9	49,759.5	51,151.0
Mutton	3,799.0	4,177.9	4,594.6	5,052.9	5,556.9	6,111.1	6,720.7	7,391.0	8,431.0	9,617.3	10,970.5	12,514.2	14,275.0
Beef	2,750.0	2,991.5	3,254.2	3,540.0	3,850.8	4,189.0	4,556.8	4,957.0	4,991.9	5,027.1	5,062.5	5,098.1	5,134.0
Chicken	1,580.0	2,373.7	3,566.2	5,357.7	8,049.1	12,092.6	18,167.5	27,294.0	30,005.6	32,986.6	36,263.7	39,866.4	43,827.0
Egg	1,950.0	2,490.2	3,180.0	4,061.0	5,186.0	6,622.5	8,457.2	10,800.0	11,683.2	12,638.7	13,672.3	14,790.4	16,000.0
Other Vegetables	584.0	584.0	584.0	584.0	584.0	584.0	584.0	584.0	584.0	584.0	584.0	584.0	584.0
Other Tubers	168.0	175.3	182.9	190.8	199.0	207.6	216.6	226.0	235.0	244.5	254.2	264.4	275.0
Other Citrus	1,200.0	1,205.2	1,210.5	1,215.7	1,221.0	1,226.3	1,231.6	1,237.0	1,243.9	1,250.9	1,257.9	1,264.9	1,272.0
Other Fruits	1,211.0	1,290.2	1,374.6	1,464.5	1,560.3	1,662.4	1,771.1	1,887.0	1,887.0	1,887.0	1,887.0	1,887.0	1,887.0
Total (Area Only:ha)	54,641.0	54,929.3	55,250.1	55,605.5	55,998.4	56,432.2	56,910.9	57,439.0	57,959.7	58,499.8	59,059.9	59,640.8	60,243.0

Table 1.3 Gross Output in Agricultural Sector (1988-2000)

(1,000 R.O.)

Crop	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Date Palm	14,864.6	15,322.1	15,797.8	16,292.6	16,807.2	17,342.6	17,899.6	18,479.2	19,082.4	19,710.3	20,363.9	21,044.4	21,753.0
Grape	450.0	553.3	680.2	836.3	1,028.2	1,264.2	1,554.3	1,911.0	1,977.7	2,046.7	2,118.1	2,192.1	2,268.6
Banana	3,536.0	3,680.3	3,830.6	3,987.2	4,150.3	4,320.3	4,497.3	4,681.7	4,856.6	5,038.2	5,226.7	5,422.4	5,625.6
Coconut	826.6	937.3	1,063.0	1,205.5	1,367.2	1,550.6	1,758.6	1,994.7	2,061.9	2,131.5	2,203.5	2,278.0	2,356.0
Papaya	573.3	553.1	533.6	514.9	496.9	479.6	462.9	446.9	467.7	489.6	512.6	536.7	561.9
Alfalfa	11,720.4	12,184.5	12,667.0	13,168.6	13,690.2	14,232.6	14,796.5	15,382.8	16,199.3	17,059.1	17,964.8	18,918.6	19,923.1
Rhodes Grass	14,650.6	15,346.9	16,079.1	16,849.2	17,659.3	18,511.6	19,408.7	20,353.0	21,623.3	22,977.3	24,420.8	25,960.1	27,601.9
Wheat	179.7	188.7	198.1	207.9	218.3	229.2	240.6	252.6	267.7	283.8	300.8	318.8	337.9
Sorghum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cowpea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tomato	3,928.3	4,029.0	4,132.5	4,238.8	4,348.1	4,460.3	4,575.7	4,694.2	4,788.3	4,884.5	4,982.8	5,083.2	5,185.9
Sweet Melon	7,123.1	7,513.6	7,925.9	8,361.2	8,820.8	9,306.0	9,818.3	10,359.3	10,948.7	11,572.2	12,231.6	12,929.1	13,666.8
Potato	409.5	497.1	603.5	732.6	889.3	1,079.5	1,310.5	1,590.8	1,635.2	1,680.7	1,727.6	1,775.7	1,825.2
Carrot	1,199.5	1,225.6	1,252.3	1,279.5	1,307.4	1,335.8	1,364.9	1,394.6	1,451.6	1,511.0	1,572.7	1,637.1	1,704.0
Garlic	660.0	681.6	703.9	727.1	751.1	775.9	801.6	828.3	850.7	873.7	897.5	921.9	947.1
Cabbage	1,161.2	1,207.0	1,254.7	1,304.3	1,355.9	1,409.6	1,465.4	1,523.4	1,584.8	1,648.7	1,715.2	1,784.4	1,856.4
Okra	178.4	178.8	179.2	179.6	180.0	180.4	180.8	181.3	190.1	199.4	209.1	219.3	230.0
Onion	690.5	711.1	732.3	754.1	776.6	799.8	823.7	848.4	898.0	950.6	1,006.2	1,065.1	1,127.5
Cucumber	2,016.6	2,068.0	2,120.7	2,174.8	2,230.3	2,287.2	2,345.6	2,405.5	2,499.5	2,597.2	2,698.7	2,804.2	2,913.9
Eggplant	486.8	504.8	523.6	543.1	563.4	584.5	606.4	629.1	658.8	689.8	722.4	756.6	792.5
Radish	1,449.0	1,509.4	1,572.8	1,639.3	1,709.1	1,782.4	1,859.3	1,939.9	2,029.1	2,122.9	2,221.6	2,325.4	2,434.6
Squash	418.1	434.4	451.3	468.9	487.1	506.1	525.8	546.3	571.2	597.2	624.4	652.8	682.5
Cauliflower	160.2	160.6	161.0	161.4	161.9	162.4	162.9	163.4	171.0	178.9	187.3	196.0	205.2
Lime, Lemon	4,179.6	4,103.8	4,029.7	3,957.1	3,886.2	3,816.8	3,748.9	3,682.5	3,783.7	3,887.9	3,995.5	4,106.4	4,220.8
Mango	1,890.0	1,964.3	2,041.2	2,121.9	2,206.2	2,294.3	2,386.4	2,482.8	2,578.1	2,677.6	2,781.7	2,890.6	3,004.5
Chilli Pepper	1,784.3	1,867.9	1,955.4	2,047.1	2,143.0	2,243.5	2,348.7	2,458.8	2,598.2	2,724.3	2,867.6	3,018.4	3,177.2
Tabacco	5,010.3	5,121.0	5,234.2	5,349.9	5,468.1	5,589.0	5,712.5	5,838.8	5,967.9	6,099.8	6,234.6	6,372.5	6,513.3
Milk	9,368.6	9,459.8	9,552.0	9,645.0	9,739.0	9,833.9	9,929.7	10,026.4	10,306.8	10,595.0	10,891.3	11,195.9	11,509.0
Mutton	11,397.0	12,533.8	13,783.9	15,158.7	16,670.7	18,333.4	20,162.0	22,173.0	25,292.9	28,851.8	32,911.5	37,542.5	42,825.0
Beef	5,500.0	5,983.0	6,508.4	7,079.9	7,701.6	8,378.0	9,113.7	9,914.0	9,983.8	10,054.1	10,124.9	10,196.2	10,268.0
Chicken	1,530.0	2,373.7	3,566.2	5,357.7	8,049.1	12,092.6	18,167.5	27,294.0	30,005.6	32,986.6	36,263.7	39,866.4	43,827.0
Egg	1,755.0	2,241.2	2,862.0	3,654.9	4,667.4	5,960.3	7,611.5	9,720.0	10,514.9	11,374.8	12,305.1	13,311.4	14,400.0
Other Vegetables	269.8	281.4	293.6	306.3	319.6	333.5	347.9	363.1	378.9	395.4	412.7	430.8	449.7
Other Tubers	360.4	394.3	431.6	472.7	517.8	567.5	622.2	682.5	746.5	816.8	894.1	979.1	1,072.5
Other Citrus	2,160.0	2,220.8	2,283.6	2,348.3	2,415.0	2,483.9	2,555.0	2,628.5	2,707.7	2,789.6	2,874.3	2,962.0	3,052.8
Other Fruits	302.6	367.5	446.7	543.4	661.6	806.1	982.8	1,199.2	1,374.3	1,576.1	1,808.5	2,076.5	2,385.5
Total	112,239.7	118,399.4	125,451.6	133,669.9	143,444.0	155,333.3	170,148.3	189,069.9	201,042.8	214,073.3	228,273.9	243,770.4	260,704.0
VA/Gross Production	69.3	68.9	68.4	67.7	66.9	65.8	64.5	62.8	62.4	62.0	61.5	61.0	60.6

Table 1.4 Present and Planned Farm Account by Crop

(R.O./ha,ton)

Crop	Present Cost								Present Benefit			Present	Value	Value
	Fertili. Import	Fertili. Domestic	Chemical Import	Seeds & Seedlings	Depreciat.	Other	Share of "Other"	Total	Yield	Price	Total	Balance	Added	Added Rate(%)
Date Palm	61.2		1.3		125.0	1,970.5	91.3	2,158.0	4.1	150.0	615.0	-1,543.0	337.7	54.9
Grape	70.7		3.9		125.0	1,625.4	89.1	1,825.0	15.0	300.0	4,500.0	2,675.0	4,320.7	96.0
Banana	94.4		2.6		125.0	1,693.0	88.4	1,915.0	13.6	160.0	2,176.0	261.0	1,970.0	98.5
Coconut	75.4		1.3		125.0	1,399.3	87.4	1,601.0	16.8	150.0	2,520.0	919.0	2,353.2	93.4
Papaya	47.1		2.6		125.0	1,450.3	89.2	1,625.0	12.0	175.0	2,100.0	475.0	1,956.9	93.2
Alfalfa	94.5	60.9	10.3	860.0	125.0	778.3	40.3	1,920.0	38.4	60.0	2,304.0	375.0	1,228.2	53.3
Rhodes Grass	472.6	60.9	0.0	50.0	125.0	1,216.5	63.2	1,925.0	57.6	50.0	2,880.0	955.0	2,218.2	77.0
Wheat	47.3	60.9	0.0	32.1	125.0	395.7	59.9	661.0	1.5	256.0	384.0	-277.0	218.2	56.8
Sorghum	236.3	60.9	2.6	11.0	125.0	939.2	68.3	1,375.0	53.3	50.0	2,665.0	1,290.0	2,293.7	86.1
Cowpea	23.6	60.9	1.3	72.0	125.0	1,147.2	80.2	1,430.0	15.0	150.0	2,250.0	820.0	2,018.3	89.7
Tomato	52.0	60.9	12.9	7.6	125.0	1,363.6	84.1	1,622.0	22.2	146.0	3,241.2	1,619.2	3,020.0	93.2
Sweet Melon	35.9	60.9	12.9	19.6	125.0	1,398.7	84.6	1,653.0	13.1	290.0	3,799.0	2,146.0	3,579.6	94.2
Potato	75.6	60.9	3.9	598.4	125.0	541.2	38.7	1,397.0	25.0	117.0	2,925.0	1,528.0	2,159.3	73.8
Carrot	75.6	60.9	2.6	2.9	125.0	1,268.0	82.5	1,525.0	23.0	200.0	4,760.0	3,235.0	4,537.0	95.3
Garlic	85.1	60.9	1.3	297.0	125.0	857.7	60.1	1,427.0	8.0	550.0	4,400.0	2,973.0	3,980.5	88.6
Cabbage	33.1	60.9	3.9	3.8	125.0	1,178.3	83.9	1,405.0	23.2	65.0	1,508.0	103.0	1,330.4	88.2
Okra	52.0	60.9	3.9	41.6	125.0	1,340.6	82.5	1,624.0	13.2	255.0	3,366.0	1,742.0	3,121.3	92.7
Onion	76.0	61.2	3.9	593.6	125.0	544.2	38.8	1,404.0	13.7	90.0	1,233.0	-171.0	498.2	48.4
Cucumber	35.5	41.6	8.8	5.2	125.0	930.9	81.2	1,147.0	14.9	282.0	3,889.8	1,862.8	2,918.7	97.9
Eggplant	51.2	60.0	12.7	7.5	125.0	1,343.6	84.0	1,600.0	19.0	61.0	1,159.0	-441.0	1,027.6	88.7
Radish	55.0	44.3	2.8	429.3	125.0	393.6	37.5	1,050.0	23.0	100.0	2,300.0	1,250.0	1,768.6	76.9
Squash	22.9	38.9	8.2	12.5	125.0	892.5	81.1	1,100.0	15.8	140.0	2,212.0	1,112.0	2,129.5	96.3
Cauliflower	29.9	55.0	3.5	3.4	125.0	1,063.2	83.1	1,280.0	9.1	80.0	728.0	-552.0	636.2	87.4
Lime, Lemon	46.6	0.0	2.6	0.0	125.0	1,434.8	89.2	1,609.0	12.9	135.0	1,741.5	132.5	1,692.3	97.2
Mango	45.7	0.0	1.0	0.0	125.0	1,470.4	89.6	1,642.0	2.0	250.0	500.0	-1,142.0	453.4	90.7
Chilli Pepper	49.7	58.3	3.7	39.8	125.0	1,282.5	82.3	1,559.0	9.0	325.0	2,925.0	1,366.0	2,773.5	94.8
Tabacco	22.6	26.5	5.6	3.3	125.0	593.0	76.4	776.0	4.9	2,500.0	12,250.0	11,474.0	12,192.0	98.5
	Import	Domestic Input			Deprec.	Other								
Milk	77.8	36.5			27.7	7.1		149.1			225.0	75.9	110.7	49.2
Mutton	1,385.0	264.0			86.0	87.0		1,822.0			3,000.0	1,178.0	1,351.0	45.0
Beef	703.0	144.0			83.0	46.0		976.0			2,000.0	1,024.0	1,153.0	57.7
Chicken	481.0	172.0			0.0	0.0		653.0			1,000.0	347.0	347.0	34.7
Egg	543.0	62.0			0.0	0.0		605.0			900.0	295.0	295.0	32.8
Other Vegetables	52.1	56.1	6.1	146.7	125.0	1,027.8	72.7	1,413.8	6.0	77.0	462.0	-951.8	201.8	43.5
Other Tubers	75.6	60.9	3.9	598.4	125.0	541.2	38.7	1,397.0	14.3	150.0	2,145.0	748.0	1,414.2	65.9
Other Citrus	46.6	0.0	2.6	0.0	125.0	1,434.8	89.2	1,609.0	12.0	150.0	1,800.0	191.0	1,750.9	97.3
Other Fruits	63.0	0.0	2.2	0.0	125.0	1,577.7	89.2	1,767.9	1.7	147.0	249.9	-1,518.0	184.7	73.9

Table 1.4 (Continued)

Crop	Cultivation Area Prospects(ha)			Area Increase rate (%)		Production Prospect (t)			Production Increase rate (%)		Yield Prospect (t)		
	1988	1995	2000	1988-95	1995-2000	1988	1995	2000	1988-95	1995-2000	1988	1995	2000
Date Palm	24,170.0	24,170.0	24,170.0	0.00	0.00	99,097.0	126,651.0	145,020.0	3.57	2.75	4.1	5.2	6.0
Grape	100.0	370.0	398.0	20.55	1.47	1,500.0	6,433.0	7,562.0	23.12	3.29	15.0	17.4	19.0
Banana	1,625.0	1,719.0	1,758.0	0.81	0.45	22,100.0	29,977.0	35,160.0	4.45	3.24	13.6	17.4	20.0
Coconut	328.0	628.0	628.0	9.72	0.00	5,510.4	13,640.0	15,700.0	13.82	2.85	16.8	21.7	25.0
Papaya	273.0	163.0	169.0	-7.10	0.73	3,276.0	2,642.0	3,211.0	-3.03	3.98	12.0	16.2	19.0
Alfalfa	5,087.0	6,003.5	7,206.0	2.39	3.72	195,340.8	263,696.6	332,052.5	4.38	4.72	38.4	43.9	46.1
Rhodes Grass	5,087.0	6,004	7,206	2.39	3.72	293,011.2	422,524.2	552,037.2	5.37	5.49	57.6	70.4	76.6
Wheat	468.0	500.0	550.0	0.95	1.92	702.0	1,020.0	1,320.0	5.48	5.29	1.5	2.0	2.4
Sorghum						0.0		0.0					
Cowpea						0.0		0.0					
Tomato	1,212.0	1,028.0	888.0	-2.32	-2.89	26,906.4	33,792.0	35,520.0	3.31	1.00	22.2	32.9	40.0
Sweet Melon	1,875.0	1,965.0	2,049.0	0.67	0.84	24,562.5	42,130.0	47,127.0	8.01	2.27	13.1	21.4	23.0
Potato	140.0	489.0	520.0	19.56	1.24	3,500.0	13,702.0	15,600.0	21.53	2.63	25.0	28.0	30.0
Carrot	252.0	256.0	284.0	0.23	2.10	5,997.6	7,048.0	8,520.0	2.33	3.87	23.8	27.5	30.0
Garlic	150.0	136.0	123.0	-1.39	-1.99	1,200.0	1,581.0	1,722.0	4.02	1.72	8.0	11.6	14.0
Cabbage	770.0	795.0	816.0	0.46	0.52	17,864.0	24,083.0	28,560.0	4.36	3.47	23.2	30.3	35.0
Okra	53.0	40.0	41.0	-3.94	0.50	699.6	745.0	902.0	0.90	3.90	13.2	18.6	22.0
Onion	560.0	587.0	696.0	0.67	3.47	7,672.0	9,561.0	12,528.0	3.19	5.55	13.7	16.3	18.0
Cucumber	670.0	591.0	577.0	-1.78	-0.48	9,983.0	12,394.0	14,425.0	3.14	3.08	14.9	21.0	25.0
Eggplant	420.0	401.0	406.0	-0.66	0.25	7,980.0	10,748.0	12,992.0	4.35	3.87	19.0	26.8	32.0
Radish	630.0	642.0	658.0	0.27	0.49	14,490.0	20,153.0	24,346.0	4.83	3.85	23.0	31.4	37.0
Squash	189.0	189.0	195.0	0.00	0.63	2,986.2	4,031.0	4,875.0	4.38	3.88	15.8	21.3	25.0
Cauliflower	220.0	168.0	171.0	-3.78	0.35	2,002.0	2,129.0	2,565.0	0.88	3.80	9.1	12.7	15.0
Lime, Lemon	2,400.0	1,716.0	1,690.0	-4.68	-0.30	30,960.0	27,907.0	31,265.0	-1.47	2.30	12.9	16.3	18.5
Mango	3,780.0	3,935.0	4,006.0	0.58	0.36	7,560.0	10,231.0	12,013.0	4.42	3.27	2.0	2.6	3.0
Chilli Pepper	610.0	601.0	611.0	-0.21	0.33	5,490.0	7,934.0	9,776.0	5.40	4.26	9.0	13.2	16.0
Tabacco	409.0	409.0	409.0	0.00	0.00	2,004.1	2,354.8	2,605.3	2.33	2.04	4.9	5.8	6.4
	Production (t)												
Milk	41,638.0	44,562.0	51,151.0	0.97	2.80	41,638.0	44,562.0	51,151.0	0.97	2.80			
Mutton	3,799.0	7,391.0	14,275.0	9.97	14.07	3,799.0	7,391.0	14,275.0	9.97	14.07			
Beef	2,750.0	4,957.0	5,134.0	8.78	0.70	2,750.0	4,957.0	5,134.0	8.78	0.70			
Chicken	1,580.0	27,294.0	43,827.0	50.24	9.93	1,580.0	27,294.0	43,827.0	50.24	9.93			
Egg	1,950.0	10,800.0	16,000.0	27.70	8.18	1,950.0	10,800.0	16,000.0	27.70	8.18			
Other Vegetables	584.0	584.0	584.0	0.00	0.00	3,504.0	4,555.0	5,840.0	3.82	5.10	6.0	7.8	10.0
Other Tubers	168.0	226.0	275.0	4.33	4.00	2,402.4	5,679.0	7,150.0	13.08	4.71	14.3	25.1	26.0
Other Citrus	1,200.0	1,237.0	1,272.0	0.43	0.56	14,400.0	17,324.0	20,352.0		3.27	12.0	14.0	16.0
Other Fruits	1,211.0	1,887.0	1,887.0	6.54	0.00	2,058.7	13,964.0	16,228.2	31.45	3.85	1.7	7.4	8.6
Total	54,641.0	57,439.0	60,243.0										

Table 1.5

Calculation of Cost Component in Animal Husbandry Management

1. Livestock Plan with 40 head of Cross-bred Goats

Item	Quantity	Unit Price	Amount	Quantity (kg)	Unit Price (R.O./Product 1kg)
Cull (heads)	5.0	77.0	385.0	150.0	2.567
Young (heads)	23.0	64.0	1,472.0	368.0	4.000
Milk (home consump.)	1,270.0	0.4	508.0		
Benefit Total			1,857.0	518.0	3.585
Feed Concentrate	4.9	79.0	384.7		0.743
Feed Mineral	40.0	0.36	14.4		0.028
Fertilizer	0.47	550.0	257.8		0.498
Veterinary	40.0	0.4	16.0		0.031
Repairs	1.0	15.0	15.0		0.029
Fuel	9,375.0	0.00012	1.1		0.002
Depreciation	1.0	230.0	230.0		0.444
Tools	40.0	0.2	8.0		0.015
Contingency	927.0	0.05	46.4		0.089
Cost Total			973.4		1.879
Net Benefit			883.6		

Cost Component	Unit Price (R.O.)
Import	1.268
Domestic	0.062
Depricia.	0.459
Labor	
Other	0.089
Total	1.879

2. Livestock Plan with 100 head of Local Goats

Item	Quantity	Unit Price	Amount	Quantity (kg)	Unit Price (R.O./Product 1kg)
Cull (heads)	14.0	69.0	966.0	385.0	2.509
Young (heads)	25.0	64.0	1,600.0	356.3	4.491
Milk (home consump.)	1,718.0	0.4	687.2		
Benefit Total			2,566.0	741.3	3.462
Feed Hay	2.65	70.0	185.5		0.250
Feed Concentrate	12.54	79.0	990.7		1.336
Feed Mineral	100.0	0.36	36.0		0.049
Veterinary	100.0	0.1	10.0		0.013
Transport	450.0	0.12	54.0		0.073
Tools	1.0	10.0	10.0		0.013
Contingency	1,286.2	0.05	64.3		0.087
Cost Total			1,350.5		1.822
Net Benefit			1,215.5		

Cost Component	Unit Price (R.O.)
Import	1.385
Domestic	0.264
Depricia.	0.086
Labor	
Other	0.087
Total	1.822

Table 1.5 (Continued)

3. Livestock Plan with 10 head of Cross-bred Cows

Item	Quantity	Unit Price	Amount	Quantity (kg,t)	Unit Price (R.O./Product 1kg.t)
Cull (heads)	1.0	200.0	200.0	160.0	1.250
Young (heads)	2.0	60.0	120.0	50.0	2.400
Young (heads)	1.0	120.0	120.0	50.0	2.400
Milk (selling)	7,595.0	0.225	1,708.9	7.6	225.000
Milk (home consump.)	4,706.0	0.225	1,058.9		
Benefit Total			2,148.9	267.6	8.030
Feed Concentrate	9.2	79.0	728.4		76.266
Feed Cost	0.634	550.0	348.7		36.511
Feed Mineral	10.0	1.44	14.4		1.508
Depreciation	1.0	260.0	260.0		27.224
Tools	1.0	5.0	5.0		0.524
Contingency	1,356.5	0.05	67.8		7.102
Cost Total			1,424.3		149.133
Net Benefit			724.6		

Cost Component	Unit Price (R.O.)
Import	77.773
Domestic	36.511
Depricia.	27.747
Labor	
Other	7.102
Total	149.133

4. Livestock Plan with 80 head of Local Cattle

Item	Quantity	Unit Price	Amount	Quantity (kg)	Unit Price (R.O./Product 1kg)
Cull (heads)	9.0	200.0	1,800.0	1,125.0	1.600
Young (heads)	15.0	60.0	900.0	375.0	2.400
Young (heads)	6.0	120.0	720.0	300.0	2.400
Milk (selling)	5,883.0	0.225	1,323.7		
Milk (home consump.)	1,764.9	0.225	397.1		
Benefit Total			4,743.7	1,600.0	6.400
Feed Hay	5.1	70.0	358.4		0.144
Feed Concentrate	20.5	80.0	1,640.0		0.657
Feed Mineral	80.0	1.44	115.2		0.046
Transport	1,563.0	0.1	187.6		0.075
Tools	1.0	20.0	20.0		0.008
Contingency	2,321.2	0.05	116.1		0.046
Cost Total			2,437.2		0.976
Net Benefit			2,306.5		

Cost Component	Unit Price (R.O.)
Import	0.703
Domestic	0.144
Depricia.	0.083
Labor	
Other	0.046
Total	0.976

Table 1.5 (Continued)

5. Livestock Plan with 17,110 head of Local Cattle Fatten ing

Item	Quantity	Unit Price	Amount	Quantity (kg)	Unit Price (R.O./Product 1kg)
Young (♂ heads)	16,088.0	198.0	3,185,424.0	1,769,680.0	1.800
Young (♀ heads)	6,033.0	180.0	1,085,940.0	603,300.0	1.800
Benefit Total			4,271,364.0	2,372,980.0	1.800
Livestock Purchase	16,934.0	60.0	1,016,040.0		0.428
Livestock Purchase	6,350.0	120.0	762,000.0		0.321
Feed Hay	6,371.0	70.0	445,970.0		0.188
Feed Concentrate	18,106.0	80.0	1,448,480.0		0.610
Feed Mineral	17,110.0	1.44	24,638.4		0.010
Veterinary	17,110.0	1.4	23,954.0		0.010
Repairs	1.0	43,868.0	43,868.0		0.018
Depreciation	1.0	154,510.0	154,510.0		0.065
Tools	17,110.0	0.01	171.1		0.000
Manager	1.0	6,912.0	6,912.0		0.003
Veterinarian	1.0	6,912.0	6,912.0		0.003
Assistant	4.0	2,808.0	11,232.0		0.005
Others	36.0	2,040.0	73,440.0		0.031
Fuel	250.0	120.0	30,000.0		0.013
Contingency	4,048,127.5	0.05	202,406.4		0.085
Cost Total			4,250,533.9		1.791
Net Benefit			20,830.1		0.009

6-1. Small Holder Egg Farm (75,000 eggs)

Item	Quantity	Unit Price	Amount	Quantity (kg)	Unit Price (R.O./Product 1kg)
Point of Lay Pullets	500.0	2.3	1,150.0		0.271
Feed	12.0	95.0	1,140.0		0.268
Water	19.0	0.25	4.8		0.001
Kerosene	1.0	15.0	15.0		0.004
Repairs	0.1	2,580.0	258.0		0.061
Cost Total			2,567.8		0.604
Egg Sale	75,000.0	0.045	3,375.0	3,750.0	0.900
Sale of Spent Layer	450.0	1.0	450.0	360.0	
Benefit Total			3,825.0		
Net Benefit			1,257.3		

Cost Component	Unit Price (R.O.)
Import	0.542
Domestic	0.062
Depricia.	
Labor	
Other	
Total	0.604

Table 1.5 (Continued)

6-2. Small Holder Egg Farm (45,000 eggs)

Item	Quantity	Unit Price	Amount	Quantity (kg)	Unit Price (R.O./Product 1kg)
Point of Lay Pullets	300.0	2.3	690.0		0.3
Feed	7.2	95.0	684.0		0.3
Water	11.0	0.25	2.8		0.0
Kerosene	1.0	10.0	10.0		0.0
Repairs	0.1	1,550.0	155.0		0.1
Cost Total			1,541.8		0.6
Egg Sale	45,000.0	0.045	2,025.0	2,250.0	0.900
Sale of Spent Layer	270.0	1.0	270.0	216.0	
Benefit Total			2,295.0		
Net Benefit			753.3		

Cost Component	Unit Price (R.O.)
Import	0.543
Domestic	0.062
Depricia.	
Labor	
Other	
Total	0.605

7-1. Small Holder Broiler Farm (18,000 broilers)

Item	Quantity	Unit Price	Amount	Quantity (kg)	Unit Price (R.O./Product 1kg)
Day-old Chicken	18,000.0	0.17	3,060.0		0.213
Feed	50.4	105.0	5,292.0		0.368
Water	64.0	0.25	16.0		0.001
Kerosene	1.0	108.0	108.0		0.008
Repairs	0.1	9,300.0	930.0		0.065
Cost Total			9,406.0		0.653
Broiler Sale	18,000.0	0.75	13,536.0	14,400.0	0.940
Benefit Total			13,536.0		
Net Benefit			4,130.0		

Cost Component	Unit Price (R.O.)
Import	0.481
Domestic	0.172
Depricia.	
Labor	
Other	
Total	0.653

7-2. Small Holder Broiler Farm (9,000 broilers)

Item	Quantity	Unit Price	Amount	Quantity (kg)	Unit Price (R.O./Product 1kg)
Day-old Chicken	9,000.0	0.17	1,530.0		0.213
Feed	25.2	105.0	2,646.0		0.368
Water	32.0	0.25	8.0		0.001
Kerosene	1.0	54.0	54.0		0.008
Repairs	0.1	4,650.0	465.0		0.065
Cost Total			4,703.0		0.653
Broiler Sale	9,000.0	0.75	6,768.0	7,200.0	0.940
Benefit Total			6,768.0		
Net Benefit			2,065.0		

Cost Component	Unit Price (R.O.)
Import	0.481
Domestic	0.172
Depricia.	
Labor	
Other	
Total	0.653

Table 1.6

Growth of Intermediate Consumption in Agriculture Sector (R.O./ha, ton)

Crop	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Date Palm	277.3	280.7	284.2	287.7	291.3	294.9	298.5	302.2	306.0	309.8	313.6	317.5	321.4
Grape	179.3	180.6	182.0	183.3	184.7	186.1	187.5	188.9	190.3	191.7	193.1	194.6	196.0
Banana	206.0	208.9	211.8	214.8	217.8	220.9	224.0	227.1	230.3	233.5	236.8	240.1	243.5
Coconut	166.8	169.0	171.2	173.4	175.6	177.9	180.2	182.6	184.9	187.3	189.8	192.2	194.7
Papaya	143.1	143.0	142.8	142.7	142.6	142.5	142.4	142.2	142.1	142.0	141.9	141.7	141.6
Alfalfa	1,075.8	1,089.6	1,103.5	1,117.6	1,131.8	1,146.3	1,160.9	1,175.7	1,190.7	1,205.9	1,221.3	1,236.9	1,252.6
Rhodes Grass	661.8	693.3	726.3	760.9	797.1	835.0	874.7	916.3	959.9	1,005.6	1,053.4	1,103.5	1,156.0
Wheat	165.8	172.2	178.9	185.9	193.1	200.6	208.4	216.5	224.9	233.7	242.7	252.2	262.0
Sorghum	371.3	388.4	406.3	425.1	444.7	465.2	486.7	509.2	532.7	557.3	583.0	609.9	638.0
Cowpea	231.7	235.4	239.2	243.1	247.1	251.1	255.1	259.3	263.5	267.7	272.1	276.5	281.0
Tomato	221.2	226.5	232.0	237.5	243.2	249.1	255.0	261.2	267.4	273.8	280.4	287.1	294.0
Sweet Melon	219.4	223.6	227.9	232.2	236.7	241.2	245.8	250.5	255.3	260.2	265.2	270.3	275.5
Potato	765.7	777.1	788.7	800.5	812.5	824.7	837.0	849.5	862.2	875.1	888.2	901.5	915.0
Carrot	223.0	229.7	236.6	243.6	250.9	258.4	266.2	274.1	282.3	290.8	299.5	308.5	317.7
Garlic	499.5	509.4	519.4	529.7	540.1	550.8	561.7	572.8	584.1	595.6	607.3	619.3	631.5
Cabbage	177.6	181.7	185.8	190.1	194.5	198.9	203.5	208.2	212.9	217.8	222.8	228.0	233.2
Okra	244.7	250.0	255.3	260.8	266.4	272.1	277.9	283.8	289.9	296.1	302.5	308.9	315.5
Onion	734.8	748.8	763.1	777.7	792.5	807.6	823.0	838.7	854.7	871.0	887.6	904.6	921.8
Cucumber	91.1	96.1	101.5	107.1	113.0	119.3	125.9	132.9	140.3	148.1	156.3	165.0	174.1
Eggplant	131.4	140.3	149.8	160.0	170.8	182.4	194.7	207.9	222.0	237.0	253.1	270.2	288.5
Radish	531.4	535.1	538.7	542.4	546.0	549.8	553.5	557.3	561.1	564.9	568.7	572.6	576.5
Squash	82.5	86.6	90.9	95.5	100.2	105.2	110.5	116.0	121.8	127.9	134.2	140.9	148.0
Cauliflower	91.8	98.0	104.8	111.9	119.6	127.7	136.5	145.8	155.8	166.4	177.8	190.0	203.0
Lime, Lemon	49.2	53.1	57.2	61.8	66.6	71.9	77.6	83.7	90.3	97.5	105.2	113.5	122.4
Mango	46.6	50.2	54.1	58.2	62.7	67.5	72.7	78.3	84.3	90.8	97.8	105.3	113.4
Chilli Pepper	151.5	160.3	169.6	179.4	189.8	200.8	212.5	224.8	237.8	251.6	266.2	281.6	297.9
Tabacco	58.0	59.6	61.3	63.0	64.7	66.5	68.3	70.2	72.2	74.2	76.2	78.3	80.5
Milk	114.3	114.3	114.3	114.4	114.4	114.4	114.4	114.4	114.4	114.5	114.5	114.5	114.5
Mutton	1,649.0	1,649.2	1,649.4	1,649.7	1,649.9	1,650.1	1,650.3	1,650.5	1,650.7	1,651.0	1,651.2	1,651.4	1,651.6
Beef	847.0	847.1	847.2	847.3	847.5	847.6	847.7	847.8	847.9	848.0	848.1	848.3	848.4
Chicken	653.0	653.0	653.0	653.0	653.0	653.0	653.0	653.0	653.0	653.0	653.0	653.0	653.0
Egg	605.0	605.0	605.0	605.0	605.0	605.0	605.0	605.0	605.0	605.0	605.0	605.0	605.0
Other Vegetables	261.0	270.5	280.2	290.3	300.8	311.7	322.9	334.6	346.6	359.1	372.1	385.5	399.4
Other Tubers	730.8	744.6	758.7	773.0	787.7	802.6	817.7	833.2	849.0	865.0	881.4	898.0	915.0
Other Citrus	49.2	53.1	57.2	61.8	66.6	71.9	77.6	83.7	90.3	97.5	105.2	113.5	122.4
Other Fruits	65.2	70.6	76.5	82.9	89.9	97.4	105.5	114.3	123.9	134.2	145.4	157.6	170.7

Table 1.7

Growth of Unit Value Added (R.O./ha, ton)

Crop	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Date Palm	337.7	353.2	369.4	386.4	404.1	422.6	442.0	462.3	483.5	505.7	528.9	553.2	578.6
Grape	4,320.7	4,408.8	4,498.6	4,590.3	4,683.8	4,779.2	4,876.6	4,976.0	5,077.4	5,180.8	5,286.4	5,394.1	5,504.0
Banana	1,970.0	2,037.8	2,107.9	2,180.4	2,255.4	2,333.1	2,413.3	2,496.4	2,582.3	2,671.2	2,763.1	2,858.2	2,956.5
Coconut	2,353.2	2,435.5	2,520.7	2,608.9	2,700.2	2,794.7	2,892.4	2,993.6	3,098.4	3,206.8	3,319.0	3,435.1	3,555.3
Papaya	1,956.9	2,037.9	2,122.2	2,210.0	2,301.5	2,396.7	2,495.9	2,599.2	2,706.8	2,818.8	2,935.4	3,056.9	3,183.4
Alfalfa	1,228.2	1,249.6	1,271.5	1,293.7	1,316.3	1,339.4	1,362.8	1,386.8	1,410.9	1,435.5	1,460.6	1,486.2	1,512.2
Rhodes Grass	2,218.2	2,253.0	2,288.4	2,324.3	2,360.9	2,398.0	2,435.6	2,473.9	2,512.7	2,552.2	2,592.3	2,633.0	2,674.4
Wheat	218.2	227.1	236.4	246.0	256.0	266.5	277.3	288.6	300.4	312.6	325.4	338.6	352.4
Sorghum	2,293.7	2,367.8	2,444.3	2,523.3	2,604.9	2,689.0	2,775.9	2,865.6	2,958.2	3,053.8	3,152.5	3,254.3	3,359.5
Cowpea	2,018.3	2,111.5	2,209.0	2,311.0	2,417.7	2,529.3	2,646.1	2,768.2	2,896.0	3,029.7	3,169.6	3,315.9	3,469.0
Tomato	3,020.0	3,176.9	3,342.0	3,515.6	3,698.2	3,890.4	4,092.5	4,305.2	4,528.8	4,764.1	5,011.7	5,272.0	5,546.0
Sweet Melon	3,579.6	3,756.9	3,943.1	4,138.4	4,343.4	4,558.5	4,784.3	5,021.3	5,270.1	5,531.1	5,805.1	6,092.7	6,394.5
Potato	2,159.3	2,192.7	2,226.5	2,260.9	2,295.8	2,331.2	2,367.2	2,403.7	2,440.8	2,478.5	2,516.7	2,555.6	2,595.0
Carrot	4,537.0	4,622.9	4,710.4	4,799.6	4,890.5	4,983.1	5,077.5	5,173.6	5,271.6	5,371.4	5,473.1	5,576.7	5,682.3
Garlic	3,900.5	4,098.6	4,306.8	4,525.5	4,755.4	4,996.9	5,250.7	5,517.4	5,797.7	6,092.2	6,401.6	6,726.8	7,068.5
Cabbage	1,330.4	1,378.8	1,428.9	1,480.8	1,534.6	1,590.4	1,648.2	1,708.1	1,770.1	1,834.5	1,901.1	1,970.2	2,041.8
Okra	3,121.3	3,261.8	3,408.6	3,562.1	3,722.4	3,890.0	4,065.1	4,248.2	4,439.4	4,639.3	4,848.1	5,066.4	5,294.5
Onion	498.2	512.4	527.0	542.0	557.5	573.4	589.8	606.6	623.9	641.7	660.0	678.8	698.2
Cucumber	2,918.7	3,046.2	3,179.3	3,318.2	3,463.2	3,614.5	3,772.4	3,937.3	4,109.3	4,288.8	4,476.2	4,671.7	4,875.9
Eggplant	1,027.6	1,069.7	1,113.5	1,159.1	1,206.6	1,256.0	1,307.4	1,361.0	1,416.7	1,474.8	1,535.2	1,598.1	1,663.5
Radish	1,768.6	1,854.4	1,944.4	2,038.8	2,137.8	2,241.5	2,350.3	2,464.4	2,584.1	2,709.5	2,841.0	2,978.9	3,123.5
Squash	2,129.5	2,211.5	2,296.8	2,385.3	2,477.2	2,572.6	2,671.7	2,774.7	2,881.6	2,992.8	3,107.9	3,227.7	3,352.0
Cauliflower	636.2	660.5	685.7	711.8	739.0	767.2	796.4	826.8	858.4	891.1	925.1	960.4	997.0
Lime, Lemon	1,692.3	1,740.8	1,790.7	1,842.0	1,894.7	1,949.0	2,004.8	2,062.3	2,121.4	2,182.1	2,244.6	2,308.9	2,375.1
Mango	453.4	466.4	479.8	493.5	507.7	522.2	537.2	552.6	568.5	584.8	601.6	618.8	636.6
Chilli Pepper	2,773.5	2,908.3	3,049.6	3,197.9	3,353.3	3,516.3	3,687.2	3,866.5	4,054.4	4,251.5	4,458.2	4,674.9	4,902.1
Tabacco	12,192.0	12,461.2	12,736.3	13,017.4	13,304.8	13,598.6	13,898.8	14,205.6	14,519.2	14,839.8	15,167.4	15,502.3	15,844.5
Milk	110.7	110.7	110.7	110.6	110.6	110.6	110.6	110.6	110.6	110.5	110.5	110.5	110.5
Mutton	1,351.0	1,350.8	1,350.6	1,350.3	1,350.1	1,349.9	1,349.7	1,349.5	1,349.3	1,349.0	1,348.8	1,348.6	1,348.4
Beef	1,153.0	1,152.9	1,152.8	1,152.7	1,152.5	1,152.4	1,152.3	1,152.2	1,152.1	1,152.0	1,151.8	1,151.7	1,151.6
Chicken	347.0	347.0	347.0	347.0	347.0	347.0	347.0	347.0	347.0	347.0	347.0	347.0	347.0
Egg	295.0	295.0	295.0	295.0	295.0	295.0	295.0	295.0	295.0	295.0	295.0	295.0	295.0
Other Vegetables	201.0	211.5	222.5	234.2	246.4	259.3	272.9	287.2	302.2	318.0	334.6	352.1	370.6
Other Tubers	1,414.2	1,505.0	1,601.7	1,704.6	1,814.1	1,930.6	2,054.6	2,186.6	2,327.0	2,476.5	2,635.6	2,804.8	2,985.0
Other Citrus	1,750.8	1,789.6	1,829.3	1,869.8	1,911.3	1,953.6	1,996.9	2,041.2	2,086.4	2,132.6	2,179.9	2,228.2	2,277.6
Other Fruits	184.7	214.2	248.4	288.1	334.1	387.5	449.4	521.2	604.5	701.0	813.0	942.9	1,093.5

Table 1.8

Intermediate Consumption in Agriculture Sector (1,000 R.O.)

Crop	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Date Palm	6,702.0	6,784.9	6,868.9	6,954.0	7,040.0	7,127.2	7,215.4	7,304.8	7,395.2	7,486.7	7,579.4	7,673.2	7,768.2
Grape	17.9	21.8	26.4	32.1	39.0	47.4	57.5	69.9	71.4	73.0	74.7	76.3	78.0
Banana	334.8	342.2	349.8	357.6	365.5	373.6	381.9	390.4	397.7	405.1	412.6	420.2	428.1
Coconut	54.7	60.8	67.6	75.1	83.5	92.8	103.2	114.7	116.1	117.6	119.2	120.7	122.3
Papaya	39.1	36.3	33.7	31.2	29.0	26.9	25.0	23.2	23.3	23.5	23.6	23.8	23.9
Alfalfa	5,472.8	5,675.4	5,885.4	6,103.3	6,329.2	6,563.4	6,806.3	7,059.3	7,414.2	7,788.0	8,180.7	8,593.2	9,026.5
Rhodes Grass	3,366.8	3,611.4	3,873.8	4,155.3	4,457.2	4,781.0	5,128.4	5,501.0	5,977.0	6,494.2	7,056.1	7,666.7	8,330.1
Wheat	77.6	81.4	85.3	89.5	93.9	98.4	103.2	108.3	114.6	121.4	128.5	136.1	144.1
Sorghum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cowpea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tomato	268.1	268.2	268.2	268.3	268.3	268.4	268.4	268.5	267.8	265.5	264.0	262.6	261.1
Sweet Melon	411.3	422.0	433.0	444.3	455.8	467.7	479.8	492.3	506.0	520.0	534.4	549.3	564.5
Potato	107.2	130.1	157.9	191.6	232.5	282.1	342.3	415.4	426.8	438.6	450.7	463.1	475.8
Carrot	56.2	58.0	59.9	61.8	63.8	65.9	68.0	70.2	73.8	77.6	81.6	85.8	90.2
Garlic	74.9	75.3	75.8	76.2	76.6	77.0	77.5	77.9	77.9	77.8	77.8	77.7	77.7
Cabbage	136.7	140.5	144.4	148.4	152.5	156.7	161.0	165.5	170.2	175.0	179.9	185.0	190.3
Okra	13.0	12.7	12.5	12.3	12.0	11.8	11.6	11.4	11.7	12.0	12.3	12.6	12.9
Onion	411.5	422.2	433.1	444.4	455.9	467.7	479.9	492.3	519.1	547.3	577.1	608.5	641.6
Cucumber	61.0	63.3	65.6	68.0	70.5	73.1	75.8	78.6	82.5	86.7	91.1	95.7	100.5
Eggplant	55.2	58.6	62.1	65.9	69.9	74.1	78.6	83.4	89.2	95.5	102.2	109.4	117.1
Radish	334.8	338.0	341.2	344.5	347.7	351.0	354.4	357.8	362.0	366.2	370.5	374.9	379.3
Squash	15.6	16.4	17.2	18.0	18.9	19.9	20.9	21.9	23.2	24.5	25.9	27.3	28.9
Cauliflower	20.2	20.8	21.3	21.9	22.5	23.2	23.8	24.5	26.3	28.2	30.2	32.4	34.7
Lime, Lemon	118.0	121.4	124.8	128.4	132.0	135.8	139.7	143.6	154.5	166.2	178.8	192.3	206.9
Mango	176.3	190.9	206.8	224.0	242.6	262.7	284.5	308.2	333.0	359.9	389.0	420.4	454.3
Chilli Pepper	92.4	97.6	103.0	108.8	114.8	121.2	128.0	135.1	143.4	152.2	161.6	171.5	182.0
Tabacco	23.7	24.4	25.1	25.8	26.5	27.2	28.0	28.7	29.5	30.3	31.2	32.0	32.9
Milk	4,759.2	4,806.3	4,853.9	4,902.0	4,950.5	4,999.5	5,049.0	5,099.0	5,242.4	5,389.8	5,541.4	5,697.2	5,857.5
Mutton	6,264.6	6,890.3	7,578.5	8,335.5	9,168.1	10,083.9	11,091.2	12,199.0	13,917.3	15,877.7	18,114.2	20,665.8	23,576.7
Beef	2,329.3	2,534.1	2,757.0	2,999.6	3,263.4	3,550.5	3,862.8	4,202.6	4,232.7	4,263.1	4,293.7	4,324.5	4,355.6
Chicken	1,031.7	1,550.8	2,328.7	3,498.6	5,256.1	7,896.5	11,863.4	17,823.8	19,593.6	21,540.2	23,680.2	26,032.7	28,619.8
Egg	1,179.8	1,506.6	1,923.9	2,456.9	3,137.5	4,006.7	5,116.6	6,534.8	7,068.4	7,646.4	8,271.7	8,948.2	9,680.8
Other Vegetables	152.4	157.9	163.6	169.6	175.7	182.0	188.6	195.4	202.4	209.7	217.3	225.2	233.3
Other Tubers	122.8	130.5	138.7	147.5	156.8	166.6	177.1	188.3	199.5	211.5	224.1	237.5	251.6
Other Citrus	59.8	63.9	69.3	75.1	81.4	88.2	95.6	103.6	112.4	121.9	132.3	143.5	155.7
Other Fruits	78.9	91.1	105.2	121.4	140.2	161.9	186.8	215.7	233.7	253.2	274.4	297.3	322.2
Total	34,419.6	36,805.3	39,661.9	43,156.4	47,529.8	53,132.1	60,474.1	70,306.1	75,608.1	81,446.7	87,882.4	94,982.7	102,823.6

Table 1.9

GDP Growth of Agriculture Sector (1,000 R.O.)

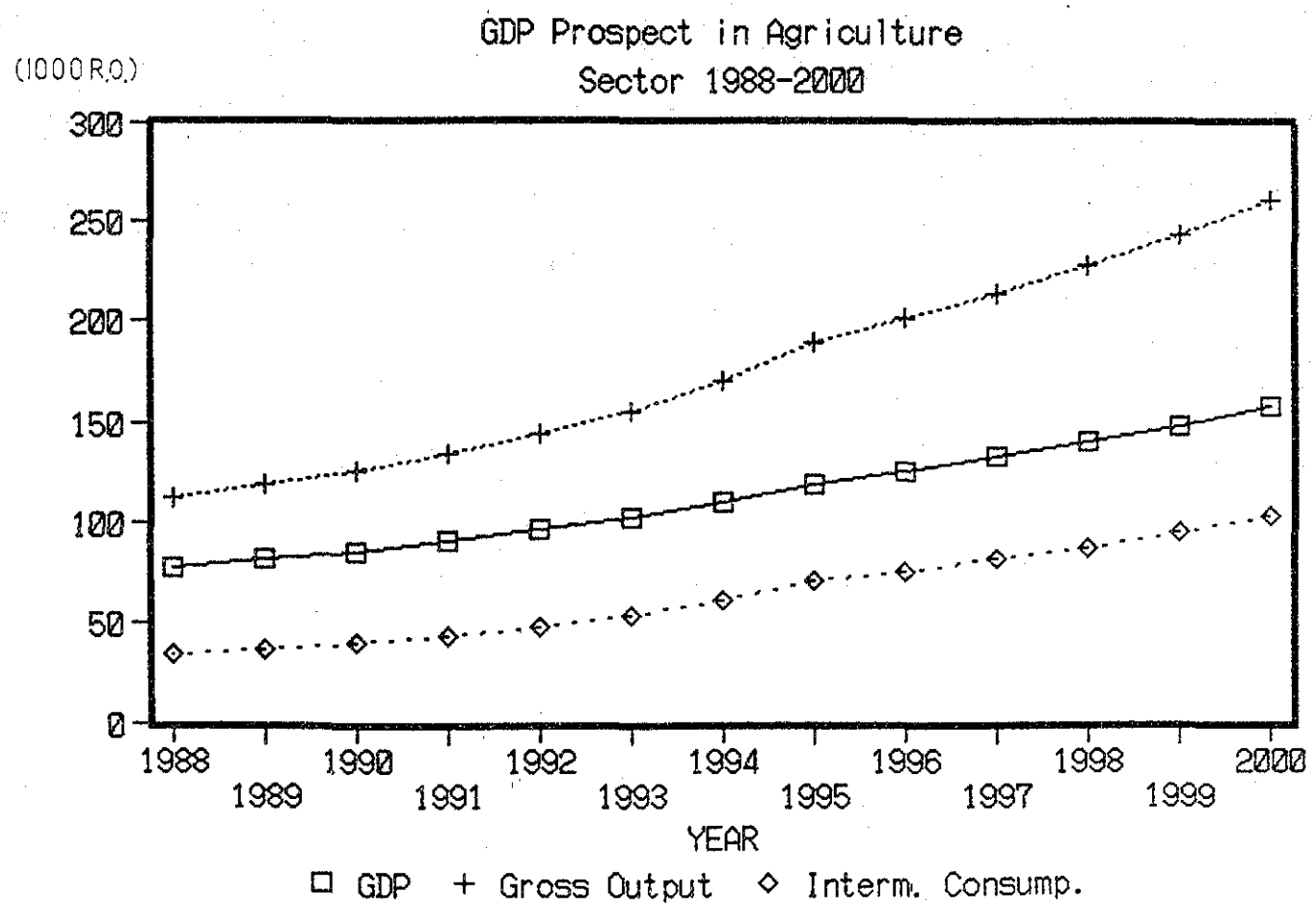
Crop	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Date Palm	8,162.6	8,537.2	8,928.9	9,338.7	9,767.2	10,215.4	10,684.2	11,174.5	11,687.3	12,223.6	12,784.5	13,371.2	13,984.8
Grape	432.1	531.5	653.8	804.2	989.2	1,216.8	1,496.7	1,841.1	1,986.2	1,973.7	2,043.5	2,115.7	2,190.6
Banana	3,201.2	3,338.1	3,480.8	3,629.6	3,784.8	3,946.6	4,115.3	4,291.3	4,458.9	4,633.1	4,814.1	5,002.1	5,197.5
Coconut	771.8	876.5	995.4	1,130.4	1,283.7	1,457.8	1,655.5	1,880.0	1,945.8	2,013.9	2,084.3	2,157.2	2,232.7
Papaya	534.2	516.8	500.0	483.7	467.9	452.7	437.9	423.7	444.4	466.2	489.0	512.9	538.0
Alfalfa	6,247.6	6,509.1	6,781.5	7,065.4	7,361.1	7,669.1	7,990.1	8,324.5	8,785.1	9,271.1	9,784.1	10,325.4	10,896.6
Rhodes Grass	11,283.8	11,735.5	12,205.3	12,693.9	13,202.1	13,730.6	14,280.3	14,852.0	15,646.3	16,483.1	17,364.7	18,293.4	19,271.8
Wheat	102.1	107.3	112.7	118.4	124.4	130.7	137.4	144.3	153.1	162.4	172.3	182.7	193.8
Sorghum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cowpea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tomato	3,660.2	3,760.9	3,864.3	3,970.6	4,079.8	4,192.0	4,307.2	4,425.7	4,521.3	4,619.0	4,718.7	4,820.7	4,924.8
Sweet Melon	6,711.8	7,091.6	7,492.9	7,916.9	8,365.0	8,838.3	9,338.5	9,866.9	10,442.8	11,052.2	11,697.2	12,379.9	13,102.3
Potato	302.3	367.0	445.6	541.0	656.8	797.4	968.1	1,175.4	1,208.3	1,242.1	1,276.9	1,312.7	1,349.4
Carrot	1,143.3	1,167.6	1,192.4	1,217.7	1,243.5	1,269.9	1,296.9	1,324.4	1,377.8	1,433.4	1,491.1	1,551.2	1,613.8
Garlic	585.1	606.2	628.2	650.9	674.5	698.9	724.2	750.4	772.8	795.9	819.7	844.2	869.4
Cabbage	1,024.4	1,066.5	1,110.3	1,155.9	1,203.4	1,252.9	1,304.3	1,357.9	1,414.6	1,473.7	1,535.2	1,599.3	1,666.1
Okra	165.4	166.1	166.7	167.3	168.0	168.6	169.3	169.9	178.5	187.4	196.8	206.7	217.1
Onion	279.0	288.9	299.1	309.7	320.7	332.1	343.9	356.1	378.9	403.2	429.1	456.6	485.9
Cucumber	1,955.5	2,004.7	2,055.1	2,106.8	2,159.8	2,214.1	2,269.8	2,326.9	2,417.0	2,510.5	2,607.6	2,708.6	2,813.4
Eggplant	431.6	446.3	461.5	477.2	493.5	510.4	527.8	545.8	569.5	594.3	620.2	647.2	675.4
Radish	1,114.2	1,171.4	1,231.6	1,294.9	1,361.4	1,431.3	1,504.9	1,582.2	1,667.2	1,756.7	1,851.1	1,950.5	2,055.3
Squash	402.5	418.0	434.1	450.8	468.2	486.2	505.0	524.4	548.0	572.7	598.5	625.5	653.6
Cauliflower	140.0	139.8	139.7	139.5	139.4	139.2	139.1	138.9	144.7	150.8	157.1	163.6	170.5
Lime, Lemon	4,061.6	3,982.4	3,904.8	3,828.7	3,754.1	3,680.9	3,609.2	3,538.9	3,629.2	3,721.7	3,816.7	3,914.0	4,013.9
Mango	1,713.7	1,773.0	1,834.4	1,897.9	1,963.6	2,031.6	2,101.9	2,174.6	2,245.0	2,317.7	2,392.8	2,470.2	2,550.2
Chilli Pepper	1,691.8	1,770.3	1,852.4	1,938.3	2,028.2	2,122.3	2,220.7	2,323.8	2,444.8	2,572.1	2,706.0	2,846.9	2,995.2
Tabacco	4,986.5	5,096.6	5,209.1	5,324.1	5,441.7	5,561.8	5,684.6	5,810.1	5,938.4	6,069.5	6,203.5	6,340.4	6,480.4
Milk	4,609.3	4,653.5	4,698.1	4,743.1	4,788.5	4,834.4	4,880.7	4,927.5	5,064.5	5,205.2	5,349.9	5,498.7	5,651.5
Mutton	5,132.4	5,643.5	6,205.3	6,823.2	7,502.5	8,249.5	9,070.9	9,974.0	11,375.6	12,974.1	14,797.3	16,876.7	19,248.3
Beef	3,170.8	3,448.8	3,751.3	4,080.4	4,438.2	4,827.5	5,250.9	5,711.4	5,751.1	5,791.0	5,831.2	5,871.7	5,912.4
Chicken	548.3	823.7	1,237.5	1,859.1	2,793.0	4,196.1	6,304.1	9,471.0	10,411.3	11,446.3	12,583.5	13,833.6	15,208.8
Egg	575.3	734.6	938.1	1,198.0	1,529.9	1,953.7	2,494.9	3,186.0	3,446.6	3,728.4	4,033.3	4,363.2	4,720.0
Other Vegetables	117.4	123.5	130.0	136.8	143.9	151.4	159.4	167.7	176.5	185.7	195.4	205.6	216.4
Other Tubers	237.6	263.8	292.9	325.2	361.0	400.9	445.1	494.2	547.0	605.4	670.1	741.6	820.9
Other Citrus	2,101.0	2,156.9	2,214.3	2,273.2	2,333.7	2,395.7	2,459.5	2,524.9	2,595.3	2,667.7	2,742.1	2,818.5	2,897.1
Other Fruits	223.7	276.4	341.5	422.0	521.4	644.2	796.0	983.5	1,140.6	1,322.8	1,534.1	1,779.2	2,063.4
Total	77,820.1	81,594.0	85,789.7	90,513.5	95,914.1	102,201.2	109,674.1	118,763.8	125,434.7	132,626.6	140,391.5	148,787.7	157,880.4
Growth Rate		4.8	5.1	5.5	6.0	6.6	7.3	8.3	5.6	5.7	5.9	6.0	6.1

Table I.10

Summary of GDP Calculation in Agriculture Sector (R.O. 1,000)

Item	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Gross Output	112,239.7	118,399.4	125,451.6	133,669.9	143,444.0	155,333.3	170,148.3	189,069.9	201,842.8	214,073.3	228,273.9	243,770.4	260,704.8
Inter. Consump.	34,419.6	36,805.3	39,661.9	43,156.4	47,529.8	53,132.1	60,474.1	70,306.1	75,608.1	81,446.7	87,882.4	94,982.7	102,823.6
Value Added	77,820.1	81,594.0	85,789.7	90,513.5	95,914.1	102,201.2	109,674.1	118,763.8	125,434.7	132,626.6	140,391.5	148,787.7	157,880.4
Tree Crop	21,201.9	21,988.8	22,853.9	23,808.3	24,865.6	26,041.7	27,356.3	28,832.5	30,052.7	31,340.3	32,700.9	34,141.1	35,668.1
Feed Crop	17,531.4	18,244.6	18,986.8	19,759.3	20,563.2	21,399.8	22,270.4	23,176.5	24,431.4	25,754.2	27,148.7	28,618.8	30,168.4
Field Crop	102.1	107.3	112.7	118.4	124.4	130.7	137.4	144.3	153.1	162.4	172.3	182.7	193.8
Vegetable	24,948.6	25,949.2	27,005.9	28,123.8	29,308.8	30,567.8	31,908.7	33,340.6	34,747.9	36,224.5	37,774.3	39,401.3	41,109.9
Livestock	14,036.0	15,304.1	16,830.3	18,703.7	21,052.2	24,061.2	28,001.4	33,269.9	36,049.6	39,145.1	42,595.3	46,443.8	50,740.2
VA Share (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Tree Crop	27.2	26.9	26.6	26.3	25.9	25.5	24.9	24.3	24.0	23.6	23.3	22.9	22.6
Feed Crop	22.5	22.4	22.1	21.8	21.4	20.9	20.3	19.5	19.5	19.4	19.3	19.2	19.1
Field Crop	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Vegetable	32.1	31.8	31.5	31.1	30.6	29.9	29.1	28.1	27.7	27.3	26.9	26.5	26.0
Livestock	18.0	18.8	19.6	20.7	21.9	23.5	25.5	28.0	28.7	29.5	30.3	31.2	32.1
VA/Gross Output (%)	69.3	68.9	68.4	67.7	66.9	65.8	64.5	62.8	62.4	62.0	61.5	61.0	60.6
GDP Growth Rate (%)		4.8	5.1	5.5	6.0	6.6	7.3	8.3	5.6	5.7	5.9	6.0	6.1
Tree Crop		3.7	3.9	4.2	4.4	4.7	5.0	5.4	4.2	4.3	4.3	4.4	4.5
Feed Crop		4.1	4.1	4.1	4.1	4.1	4.1	4.1	5.4	5.4	5.4	5.4	5.4
Field Crop		5.1	5.1	5.1	5.1	5.1	5.1	5.1	6.1	6.1	6.1	6.1	6.1
Vegetable		4.0	4.1	4.1	4.2	4.3	4.4	4.5	4.2	4.2	4.3	4.3	4.3
Livestock		9.0	10.0	11.1	12.6	14.3	16.4	18.8	8.4	8.6	8.8	9.0	9.3

Figure 1.1


GDP Prospect in Agriculture Sector 1988-2000
(1000 R.O.)
300
250
200
150
100
50
0
G
D
P
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
YEAR
GDP
Gross Output
Interm. Consump.

CHAPTER 2

PROSPECTS FOR DEMAND AND PRODUCTION FOR AGRICULTURAL PRODUCTS

CHAPTER 2 PROSPECTS FOR DEMAND AND PRODUCTION FOR AGRICULTURAL PRODUCTS

Further increases in the demand for food are predicted in Oman, in response to rising population. In addition, alterations in the varieties of food are forecast as a result of changes in consumption trends and characteristics. In order to cater to these new demands, it is necessary to make the maximum effort to increase productivity and to use the limited production base efficiently.

The prospects for demand and production for agricultural products are intended to ensure that the basic food required locally is produced domestically to the fullest extent possible. They have been prepared on the basis of the following considerations:

(1) The target year of these prospects is 2000, which is the final year of this 10-year Master Plan. The year used for comparison is 1988.

(2) The demand forecast has been prepared on the basis of the following data and analysis:

- amount of domestic production and imports vs. exports for the last 7 years
- trend of per capita food availability, obtained from analysis based on the above amounts
- trend of per capita calorie-supply per day analyzed on the basis of the above trend
- per capita food availability in neighboring countries

(3) The production prospects have been analyzed on the basis of the following data and premises:

- the analysis of the demand forecast

- improved productivity is generated by positive application of the agricultural policy

- recent and future production trends, import and export amounts, potential water resources, etc. estimated from the preceding premise

These production prospects are derived from the full agricultural production potential in Oman.

(4) Based on the above, a certain latitude should be allowed in interpreting the figures estimated.

Analyses of the predictions have been conducted to the extent possible on the basis of all available data, cross-checks and general preparation procedures for food balance sheets. These should, however, be reviewed from time to time on the basis of updated statistical data, analytical methods of statistics and supply and demand of food.

2.1 Trend and Perspective of Production and Demand for Agricultural Products

2.1.1 Trend of Production and Demand for Each Product

(1) Domestic Production of Agricultural Products

Statistics on cultivated area for, and production volume of, agricultural products, which were obtained from the Department of Agriculture Statistics in MAF, are shown in Table 2.1.1. The cultivated area was estimated by enumerators of individual extension centers and statisticians of each region, using surveys conducted twice a year, once in the winter and once in the summer. There is the occasional difference in cultivated area estimates between those from aerial photographs and those from the Department of Agriculture Statistics. In this study, the JICA team evaluated the cultivated area in the 1984/85 and 1986/87 (partly in 1987/88) by utilizing LANDSAT data. Since the results of the LANDSAT

Table 2.1.1

ESTIMATION OF AGRICULTURAL PRODUCTION ACCORDING TO THE DEPARTMENT OF AGRICULTURE STATISTICS, MAF(AREA:ha, PRODUCTION:1000t)

YEAR	1978/79*		1982		1983		1984		1985		1986		1987		1988	
CROPS	AREA	PROD.	AREA	PROD.	AREA	PROD.	AREA	PROD.	AREA	PROD.	AREA	PROD.	AREA	PROD.	AREA	PROD.
1.VEGETABLES	1934.68	N.A.	3481	54.8	3887	61.3	4302	67.9	4726	76.3	5130	83.4	5531	94.0	6040	105.4
TOMATO	331.32	N.A.	567	9.7	669	11.7	800	14.0	856	16.3	957	18.2	1055	21.7	1212	26.9
CHILI PEPPER	222.86	N.A.	317	2.7	364	3.2	420	3.7	460	4.1	490	4.6	540	5.2	610	5.5
ONION	537.02	N.A.	361	4.9	394	5.0	421	5.3	468	5.8	497	6.4	524	7.1	560	7.7
GARLIC	203.72	N.A.	115	0.9	123	1.0	122	1.0	122	1.0	195	1.6	146	1.2	150	1.2
OKRA	38.50	N.A.	37	0.4	40	0.5	41	0.5	49	0.6	49	0.6	51	0.7	53	0.7
WATERMELON	409.64	N.A.	800	14.6	875	15.9	934	17.0	1050	19.1	1100	20.2	1170	21.9	1250	23.8
S.MELON	29.04	N.A.	367	4.6	410	5.2	450	5.7	500	6.4	540	6.9	580	7.5	625	8.2
CABBAGE	32.34	N.A.	446	9.7	499	10.9	560	12.2	600	13.3	650	14.7	708	16.2	770	17.9
CUCUMBER	9.46	N.A.	421	6.1	461	6.7	504	7.3	546	7.9	580	8.5	625	9.2	670	10.0
POTATO	120.78	N.A.	50	1.2	52	1.2	50	1.2	75	1.8	72	1.7	132	3.3	140	3.5
2.FIELD CROPS	4400.44	N.A.	5572	175.6	6245	197.7	6966	221.4	7549	250.7	8237	283.3	8912	311.4	9647	339.8
WHEAT	301.62	N.A.	241	0.3	279	0.3	319	0.4	352	0.5	388	0.6	429	0.7	468	0.7
ALFALFA	3698.64	N.A.	4960	173.6	5590	195.6	6264	219.2	6810	248.4	7457	280.9	8096	308.8	8770	337.1
TOBACCO	400.18	N.A.	371	1.7	376	1.8	383	1.8	387	1.8	392	1.8	387	1.9	409	2.0
3.FRUITS	27469.47	N.A.	27715	125.6	28460	129.0	29390	132.9	29830	140.1	30487	144.7	31441	152.1	32303	161.2
DATES	20194.02	N.A.	21163	76.2	21643	77.9	22297	80.3	22516	86.2	22859	87.5	23566	92.6	24170	100.0
LIMES	2050.89	N.A.	1898	19.9	1982	20.8	2064	21.7	2147	22.5	2242	24.0	2312	24.7	2400	26.0
MANGO	2929.96	N.A.	2875	5.5	3026	5.8	3192	6.1	3300	6.3	3486	6.9	3633	7.6	3780	7.6
BANANA	1989.68	N.A.	1473	19.1	1499	19.5	1525	19.8	1547	20.0	1580	21.1	1605	21.9	1625	22.1
COCONAT	304.92	N.A.	306	4.9	310	5.0	312	5.0	320	5.1	320	5.2	325	5.3	328	5.5
**																
4.OTHER CROPS	1437.21	N.A.	4356	29.1	4753	33.5	4993	37.6	5697	42.9	6021	47.6	6342	49.6	6651	56.4
TOTAL	35241.8	N.A.	41124	385.1	43345	421.5	45651	459.8	47802	510.0	49875	559.0	52226	607.1	54641	662.8
5.TEMP.FALLOW	5782.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GRAND TOTAL	41023.84	N.A.	41124	385.1	43345	421.5	45651	459.8	47802	510.0	49875	559.0	52226	607.1	54641	662.8

"1978/79*" data are derived from the Agricultural Census 1978-1979.

"OTHER CROPS**" includes PAPAYA, CARROT, SWEET POTATO, RADISH, EGGPLANT, SQUASH, PUMPKIN, CAULIFLOWER, BEETROOT, TURNNIP, BEAN, LETTUCE, PEA, BARLEY, SORGUM, CHICKPEA, LUBIA, LEMON, SWEETLIME, FIG, GUAVA, GRAPE, POMEGRANATE, ALMOND

Data of 1982 to 1988 are derived from the Department of Agriculture Statistics of MAF

data analysis, whose details are described in section 2.4, shows that the data from the Department of Agricultural Statistics matches the estimated value from LANDSAT within the acceptable range, it will not be misleading when further examination is conducted based on the data from the Department of Agriculture Statistics.

With respect to the production volume of agricultural products, enumerators and statisticians estimated the yield of crops by weighing reaped products in certain unit areas and then multiplying the yield by separately estimated cultivating areas to obtain the volume. The volume, therefore, should be regarded as the total yield, including wastage that accumulates through handling processes like harvesting, farmgate selling, wholesaling, and retailing, in addition to domestic consumption.

According to the evaluation of Kirloskar Consultants in January 1989, the wastage percentage of total production reaches 38.8% in the case of vegetables, and 18.7% in the case of fruits. The percentage of tomatoes is the highest among vegetables at 54.7%, and that of papayas is the highest among fruits at 46.2%.

(2) Trend of Food Self-Sufficiency Rate by Product

Regarding major agricultural products, the team conducted a trial calculation of the domestic demand and self-sufficiency rate by product, on the basis of weight, as shown in Table 2.1.2. In this calculation, the total weight of some domestically produced crops was estimated according to data obtained from the Department of Agriculture Statistics. Nevertheless, the figures, including actual wastage, assume that all the products harvested in the country are consumed.

(3) Trend of Food Demand

Per capita income growth considerably influences the demand for food. An increase in national income leads to an increase in food demand, especially cereals. It also causes a shift towards high-value products. Accordingly, the GDP or GNP per capita should be considered as a variable when food demand analysis is conducted. It can be judged that time

Table 2.1.2 Self-Sufficiency Rate in Main Agricultural Products

(1982 to 1988) (IN TONS)

NO.	ITEMS		1982	1983	1984	1985	1986	1987	1988
1	CEREALS	PRODUCTION(P)	300.0	300.0	400.0	500.0	600.0	681.0	744.0
		IMPORT(I)	208,710.0	168,870.0	188,513.5	174,201.1	216,718.1	155,535.7	212,774.4
		EXPORT(E)	10,637.4	12,262.8	18,693.2	19,723.2	18,954.9	17,463.1	21,753.9
		DEMAND(D=P+I-E)	198,372.6	156,907.2	170,220.3	154,978.0	198,363.2	138,753.6	191,764.5
		SELFSUFF.(%)	0.2	0.2	0.2	0.3	0.3	0.5	0.4
	RICE	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	115,648.2	62,843.1	83,019.9	69,807.3	80,821.6	91,085.0	110,896.9
		EXPORT(E)	275.9	3,747.7	9,675.4	3,903.8	1,083.9	463.2	2,049.2
		DEMAND(D=P+I-E)	115,372.3	59,095.4	73,344.5	65,903.6	79,737.6	90,621.8	108,847.7
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	WHEAT	PRODUCTION(P)	300.0	300.0	400.0	500.0	600.0	681.0	744.0
		IMPORT(I)	85,777.1	90,396.7	96,157.2	91,997.5	131,839.7	54,572.3	97,770.8
		EXPORT(E)	10,032.4	8,420.5	8,844.9	15,666.7	10,432.5	2,733.8	3,345.9
		DEMAND(D=P+I-E)	76,044.7	82,276.2	87,712.2	76,830.8	122,007.2	52,519.5	95,168.9
		SELFSUFF.(%)	0.4	0.4	0.5	0.7	0.5	1.3	0.8
	OTHERS	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	7,284.8	15,630.1	9,336.4	12,396.3	4,056.8	9,878.4	4,106.7
		EXPORT(E)	329.2	94.6	172.9	152.7	7,438.5	14,266.2	16,358.8
		DEMAND(D=P+I-E)	6,955.6	15,535.6	9,163.5	12,243.6	-3,381.7	-4,387.7	-12,252.1
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	VEGETABLES	PRODUCTION(P)	70,054.0	79,008.0	87,856.0	98,804.0	108,620.0	118,391.0	133,908.0
		IMPORT(I)	19,872.8	20,538.6	28,472.7	16,703.4	27,966.6	50,057.3	83,411.5
		EXPORT(E)	2,183.1	1,506.6	3,374.2	3,508.0	4,735.3	6,381.9	7,720.3
		DEMAND(D=P+I-E)	87,743.7	98,039.9	112,954.4	111,999.4	131,851.3	162,066.5	209,599.2
		SELFSUFF.(%)	79.8	80.6	77.8	88.2	82.4	73.1	63.9
	TOMATO	PRODUCTION(P)	9,700.0	11,700.0	14,000.0	16,300.0	18,200.0	21,699.0	26,901.0
		IMPORT(I)	48.4	1,330.6	3,061.6	2,594.1	2,544.9	4,462.1	13,071.4
		EXPORT(E)	1,291.8	747.1	1,888.5	1,264.0	1,981.5	4,146.5	3,818.9
		DEMAND(D=P+I-E)	8,456.6	12,283.6	15,173.0	17,630.1	18,763.5	22,014.5	36,153.5
		SELFSUFF.(%)	114.7	95.2	92.3	92.5	97.0	98.6	74.4
	ONION	PRODUCTION(P)	4,900.0	5,000.0	5,300.0	5,800.0	6,400.0	7,100.0	7,700.0
		IMPORT(I)	N.A.	N.A.	N.A.	N.A.	N.A.	2,050.6	7,866.9
		EXPORT(E)	N.A.	N.A.	N.A.	N.A.	N.A.	6.6	3.3
		DEMAND(D=P+I-E)	4,900.0	5,000.0	5,300.0	5,800.0	6,400.0	9,144.0	15,563.6
		SELFSUFF.(%)	N.A.	N.A.	N.A.	N.A.	N.A.	77.6	49.5
	GARLIC	PRODUCTION(P)	900.0	1,000.0	1,000.0	1,000.0	1,600.0	1,169.0	1,200.0
		IMPORT(I)	N.A.	N.A.	N.A.	N.A.	N.A.	453.9	302.5
		EXPORT(E)	N.A.	N.A.	N.A.	N.A.	N.A.	0.3	1.0
		DEMAND(D=P+I-E)	900.0	1,000.0	1,000.0	1,000.0	1,600.0	1,622.6	1,501.5
		SELFSUFF.(%)	N.A.	N.A.	N.A.	N.A.	N.A.	72.0	79.9
	W.+S.MELON	PRODUCTION(P)	19,200.0	21,100.0	22,700.0	25,500.0	27,100.0	29,398.0	32,000.0
		IMPORT(I)	692.4	1,273.2	536.8	717.4	879.1	5,799.9	5,880.9
		EXPORT(E)	689.4	279.5	1,038.8	1,925.6	2,420.7	1,532.0	3,213.6
		DEMAND(D=P+I-E)	19,202.9	22,093.7	22,198.0	24,291.9	25,558.4	33,665.9	34,667.2
		SELFSUFF.(%)	100.0	95.5	102.3	105.0	106.0	87.3	92.3
	CABBAGE	PRODUCTION(P)	9,700.0	10,900.0	12,200.0	13,300.0	14,700.0	16,200.0	17,900.0
		IMPORT(I)	N.A.	N.A.	N.A.	N.A.	N.A.	3,993.1	3,731.2
		EXPORT(E)	N.A.	N.A.	N.A.	N.A.	N.A.	503.5	289.7
		DEMAND(D=P+I-E)	9,700.0	10,900.0	12,200.0	13,300.0	14,700.0	19,689.5	21,341.5
		SELFSUFF.(%)	N.A.	N.A.	N.A.	N.A.	N.A.	82.3	83.9
	CUCUMBER	PRODUCTION(P)	6,100.0	6,700.0	7,300.0	7,900.0	8,500.0	9,196.0	10,000.0
		IMPORT(I)	N.A.	N.A.	N.A.	N.A.	N.A.	565.1	582.9
		EXPORT(E)	N.A.	N.A.	N.A.	N.A.	N.A.	5.8	5.6
		DEMAND(D=P+I-E)	6,100.0	6,700.0	7,300.0	7,900.0	8,500.0	9,755.3	10,577.3
		SELFSUFF.(%)	N.A.	N.A.	N.A.	N.A.	N.A.	94.3	94.5
	OTHERS	PRODUCTION(P)	19,554.0	22,608.0	25,356.0	29,004.0	32,120.0	33,629.0	38,207.0
		IMPORT(I)	19,132.1	17,934.8	24,874.3	13,391.8	24,542.6	32,732.7	51,975.7
		EXPORT(E)	201.9	480.1	446.8	318.5	333.1	187.2	388.2
		DEMAND(D=P+I-E)	38,484.2	40,062.7	49,783.4	42,077.4	56,329.5	66,174.6	89,794.5
		SELFSUFF.(%)	50.8	56.4	50.9	68.9	57.0	50.8	42.5

Source: Foreign Trade Statistics (1986 and 1988, Royal Oman Police), the Department of Agricultural Statistics of MAF
Calculation of DEMAND and SELFSUFFICIENCY RATE was done by the JICA study team.

Table 2.1.2 (Continued)

(IN TONS)

NO.	ITEMS		1982	1983	1984	1985	1986	1987	1988
3	TUBERS	PRODUCTION(P)	2,438.0	2,626.0	2,800.0	3,626.0	3,726.0	5,411.0	5,900.0
		IMPORT(I)	N.A.	N.A.	N.A.	N.A.	N.A.	12,678.3	13,194.8
		EXPORT(E)	N.A.	N.A.	N.A.	N.A.	N.A.	3,216.8	2,079.0
		DEMAND(D=P+I-E)	2,438.0	2,626.0	2,800.0	3,626.0	3,726.0	14,872.5	17,015.8
		SELFSUFF.(%)	N.A.	N.A.	N.A.	N.A.	N.A.	36.4	34.7
	POTATO	PRODUCTION(P)	1,200.0	1,200.0	1,200.0	1,800.0	1,700.0	3,299.0	3,500.0
		IMPORT(I)	753.8	5,131.3	12,856.0	15,315.8	12,070.9	10,667.0	12,053.6
		EXPORT(E)	13.5	525.5	18,645.9	2,861.7	2,996.5	3,142.2	2,030.4
		DEMAND(D=P+I-E)	1,940.3	5,805.8	-4,589.8	14,254.1	10,774.4	10,823.8	13,523.2
		SELFSUFF.(%)	61.8	20.7	-26.1	12.6	15.8	30.5	25.9
	OTHERS	PRODUCTION(P)	1,238.0	1,426.0	1,600.0	1,826.0	2,026.0	2,111.0	2,400.0
		IMPORT(I)	N.A.	N.A.	N.A.	N.A.	N.A.	2,011.3	1,141.2
		EXPORT(E)	N.A.	N.A.	N.A.	N.A.	N.A.	74.6	48.6
		DEMAND(D=P+I-E)	1,238.0	1,426.0	1,600.0	1,826.0	2,026.0	4,047.7	3,492.6
		SELFSUFF.(%)	N.A.	N.A.	N.A.	N.A.	N.A.	52.2	68.7
4	BEANS,NUTS	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	743.1	859.3	765.8	666.5	694.3	527.9	2,300.3
		EXPORT(E)	43.1	15.1	12.3	53.8	132.8	18.8	21.1
		DEMAND(D=P+I-E)	700.0	844.2	753.5	612.7	561.5	509.1	2,279.2
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SOYBEAN	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	N.A.	N.A.	N.A.	N.A.	N.A.	80.4	1,049.2
		EXPORT(E)	N.A.	N.A.	N.A.	N.A.	N.A.	0.0	0.0
		DEMAND(D=P+I-E)	N.A.	N.A.	N.A.	N.A.	N.A.	80.4	1,049.2
		SELFSUFF.(%)	N.A.	N.A.	N.A.	N.A.	N.A.	0.0	0.0
	GROUNDNUTS	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	0.0	0.0	0.0	0.0	0.0	57.3	40.1
		EXPORT(E)	0.3	0.0	0.6	0.0	1.5	1.3	10.0
		DEMAND(D=P+I-E)	-0.3	0.0	-0.6	0.0	-1.5	56.0	30.1
		SELFSUFF.(%)	0.0	-	0.0	-	0.0	0.0	0.0
	OTHERS	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	743.1	859.3	765.8	666.5	694.3	390.3	1,211.0
		EXPORT(E)	42.8	15.1	11.7	53.8	131.3	17.5	11.1
		DEMAND(D=P+I-E)	700.3	844.2	754.1	612.7	563.0	372.8	1,199.9
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	FRUITS	PRODUCTION(P)	129,511.0	133,313.0	137,558.0	145,239.0	150,185.0	157,690.0	167,442.0
		IMPORT(I)	37,220.0	55,771.3	47,322.3	50,546.3	51,662.1	32,699.6	36,143.6
		EXPORT(E)	9,055.9	8,271.9	13,331.3	15,232.8	16,076.5	14,046.7	24,195.5
		DEMAND(D=P+I-E)	157,675.1	180,812.5	171,549.0	180,552.5	185,770.5	176,342.9	179,390.1
		SELFSUFF.(%)	82.1	73.7	80.2	80.4	80.8	89.4	93.3
	DATES	PRODUCTION(P)	76,200.0	77,900.0	80,300.0	86,200.0	87,500.0	92,600.0	100,000.0
		IMPORT(I)	88.3	35.3	11.7	25.3	236.9	370.9	69.6
		EXPORT(E)	1,549.5	1,366.3	4,606.1	4,905.0	4,369.5	3,659.8	4,874.7
		DEMAND(D=P+I-E)	74,738.8	76,569.1	75,705.6	81,320.3	83,367.4	89,311.0	95,194.9
		SELFSUFF.(%)	102.0	101.7	106.1	106.0	105.0	103.7	105.0
	LIME,LEMON	PRODUCTION(P)	19,900.0	20,800.0	21,700.0	22,500.0	24,000.0	24,698.0	25,999.0
		IMPORT(I)	146.9	591.8	334.5	993.4	1,607.4	720.6	655.3
		EXPORT(E)	7,218.4	6,648.7	8,372.2	9,664.4	10,735.0	9,206.0	18,495.2
		DEMAND(D=P+I-E)	12,828.5	14,743.2	13,662.4	13,829.0	14,872.4	16,212.6	8,159.1
		SELFSUFF.(%)	155.1	141.1	158.8	162.7	161.4	152.3	318.6
	OTHER CITRUS	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	9,010.7	18,673.1	10,461.4	12,508.9	12,830.5	10,635.1	11,446.4
		EXPORT(E)	15.0	0.3	7.5	0.3	0.4	265.0	73.5
		DEMAND(D=P+I-E)	8,995.7	18,672.8	10,453.9	12,508.6	12,830.1	10,370.1	11,372.9
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	BANANA	PRODUCTION(P)	19,100.0	19,500.0	19,800.0	20,000.0	21,101.0	21,900.0	22,100.0
		IMPORT(I)	2,378.6	2,225.7	3,301.9	3,492.9	3,449.4	649.0	2,849.6
		EXPORT(E)	88.5	39.4	76.1	193.5	350.2	316.8	243.2
		DEMAND(D=P+I-E)	21,390.1	21,686.3	23,025.8	23,299.4	24,200.2	22,232.1	24,706.4
		SELFSUFF.(%)	89.3	89.9	86.0	85.8	87.2	98.5	89.5

Table 2.1.2 (Continued)

(IN TONS)

NO.	ITEMS		1982	1983	1984	1985	1986	1987	1988
	COCONUTS	PRODUCTION(P)	5,000.0	5,000.0	5,000.0	5,100.0	5,200.0	5,300.0	5,500.0
		IMPORT(I)	N.A.	N.A.	N.A.	N.A.	N.A.	595.1	497.3
		EXPORT(E)	N.A.	N.A.	N.A.	N.A.	N.A.	175.2	183.8
		DEMAND(D=P+I-E)	5,000.0	5,000.0	5,000.0	5,100.0	5,200.0	5,719.9	5,813.5
		SELFSUFF.(%)	N.A.	N.A.	N.A.	N.A.	N.A.	92.7	94.6
	GRAPE	PRODUCTION(P)	103.0	119.0	133.0	152.0	169.0	176.0	200.0
		IMPORT(I)	3,322.7	3,329.0	3,363.5	5,514.4	6,218.0	4,668.9	4,796.1
		EXPORT(E)	0.0	0.0	0.0	0.0	0.0	2.5	30.0
		DEMAND(D=P+I-E)	3,425.7	3,448.0	3,496.5	5,666.4	6,387.0	4,842.4	4,966.1
		SELFSUFF.(%)	3.0	3.5	3.8	2.7	2.6	3.6	4.0
	PAPAYA	PRODUCTION(P)	1,032.0	1,188.0	1,333.0	1,521.0	1,688.0	1,759.0	2,000.0
		IMPORT(I)	N.A.	N.A.	N.A.	N.A.	N.A.	11.0	5.8
		EXPORT(E)	N.A.	N.A.	N.A.	N.A.	N.A.	3.6	6.1
		DEMAND(D=P+I-E)	1,032.0	1,188.0	1,333.0	1,521.0	1,688.0	1,766.4	1,999.7
		SELFSUFF.(%)	N.A.	N.A.	N.A.	N.A.	N.A.	99.6	100.0
	OTHERS	PRODUCTION(P)	8,276.0	8,806.0	9,292.0	9,766.0	10,527.0	11,257.0	11,643.0
		IMPORT(I)	22,272.7	30,916.4	29,849.3	28,011.5	27,319.9	15,049.0	15,823.6
		EXPORT(E)	184.5	217.2	269.5	469.6	621.5	417.8	289.1
		DEMAND(D=P+I-E)	30,364.3	39,505.2	38,871.9	37,307.9	37,225.4	25,888.2	27,177.5
		SELFSUFF.(%)	27.3	22.3	23.9	26.2	28.3	43.5	42.8
6	SUGAR	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	8,107.0	11,783.0	14,516.5	10,153.9	11,148.3	30,839.0	38,394.4
		EXPORT(E)	37.9	65.0	41.8	51.6	251.4	2,585.0	72.2
		DEMAND(D=P+I-E)	8,069.1	11,718.0	14,474.7	10,102.3	10,896.9	28,254.0	38,322.2
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	SAUCE,SPIC	PRODUCTION(P)	2,700.0	3,200.0	3,700.0	4,100.0	4,600.0	5,243.0	5,553.0
		IMPORT(I)	3,239.0	3,832.2	3,118.4	3,365.9	2,958.0	4,121.7	3,224.7
		EXPORT(E)	23.9	109.5	70.3	53.9	35.1	65.7	88.2
		DEMAND(D=P+I-E)	5,915.1	6,922.7	6,748.0	7,412.0	7,523.0	9,298.9	8,689.4
		SELFSUFF.(%)	45.6	46.2	54.8	55.3	61.1	56.4	63.9
	CHILLI PEP	PRODUCTION(P)	2,700.0	3,200.0	3,700.0	4,100.0	4,600.0	5,243.0	5,553.0
		IMPORT(I)	417.1	635.2	458.9	523.4	433.4	446.0	320.2
		EXPORT(E)	0.0	1.1	5.3	14.4	20.5	52.7	26.7
		DEMAND(D=P+I-E)	3,117.1	3,834.0	4,153.6	4,609.1	5,012.9	5,636.3	5,846.5
		SELFSUFF.(%)	86.6	83.5	89.1	89.0	91.8	93.0	95.0
	SPICE	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	2,110.8	1,734.4	1,645.6	2,000.6	1,530.7	1,538.1	1,882.5
		EXPORT(E)	12.6	9.6	29.6	39.6	14.4	10.2	21.0
		DEMAND(D=P+I-E)	2,098.2	1,724.7	1,616.0	1,961.0	1,516.3	1,527.9	1,861.5
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SAUCE	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	711.2	1,462.7	1,013.8	841.9	994.0	2,137.6	1,022.0
		EXPORT(E)	11.3	98.8	35.5	0.0	0.2	2.9	40.6
		DEMAND(D=P+I-E)	699.9	1,363.9	978.4	841.9	993.8	2,134.7	981.4
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	BEVERAGES	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	34,717.9	41,504.7	54,026.1	44,978.5	35,552.6	25,327.3	28,943.4
		EXPORT(E)	2,571.4	2,372.8	2,332.8	1,679.1	1,614.9	4,471.3	19,972.2
		DEMAND(D=P+I-E)	32,146.5	39,131.9	51,693.3	43,299.3	33,937.7	20,856.0	8,971.2
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	COFFEE	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	7.3	15.9	0.5	0.0	0.0	2,907.8	4,138.6
		EXPORT(E)	0.0	0.0	0.0	0.0	0.0	39.1	214.0
		DEMAND(D=P+I-E)	7.3	15.9	0.5	0.0	0.0	2,868.8	3,924.7
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TEA,MATE	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	4,147.4	4,212.1	5,420.1	4,733.2	3,837.0	1,803.1	1,784.6
		EXPORT(E)	127.6	182.1	611.5	242.7	178.5	235.9	264.1
		DEMAND(D=P+I-E)	4,019.8	4,030.0	4,808.6	4,490.5	3,658.5	1,567.3	1,520.5
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 2.1.2 (Continued)

(IN TONS)

NO.	ITEMS		1982	1983	1984	1985	1986	1987	1988
	COCOA	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	6.9	5.9	9.5	3.8	11.3	1.0	8.1
		EXPORT(E)	0.0	0.0	0.0	0.3	5.0	0.0	0.0
		DEMAND(D=P+I-E)	6.9	5.9	9.5	3.6	6.3	1.0	8.1
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	OTHERS	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	30,556.4	37,270.8	48,596.0	40,241.4	31,704.3	20,615.4	23,012.1
		EXPORT(E)	2,443.8	2,190.7	1,721.3	1,436.2	1,431.4	4,196.4	19,494.2
		DEMAND(D=P+I-E)	28,112.6	35,080.1	46,874.7	38,805.2	30,272.8	16,419.0	3,517.9
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	OTHER FOOD	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	4,382.2	4,612.1	6,833.4	9,339.5	9,025.3	10,166.3	9,634.8
		EXPORT(E)	854.2	107.7	8,153.3	127.7	90.1	117.8	119.3
		DEMAND(D=P+I-E)	3,528.0	4,504.3	-1,319.9	9,211.8	8,935.2	10,048.5	9,515.5
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	FEEDS	PRODUCTION(P)	178,396.0	201,254.0	225,687.0	255,931.0	289,470.0	317,809.0	347,350.0
		IMPORT(I)	38,050.4	35,439.3	76,983.3	72,757.4	98,337.6	94,032.7	120,779.7
		EXPORT(E)	4,226.5	9,472.4	5,849.2	10,279.7	5,624.0	8,973.2	5,507.6
		DEMAND(D=P+I-E)	212,219.8	227,220.9	296,821.1	318,408.7	382,183.6	402,868.4	462,622.2
		SELFSUFF.(%)	84.1	88.6	76.0	80.4	75.7	78.9	75.1
	BARLEY	PRODUCTION(P)	103.0	119.0	133.0	152.0	169.0	176.0	200.0
		IMPORT(I)	4,322.1	4,607.0	14,397.2	30,194.7	31,102.9	52,036.3	76,496.5
		EXPORT(E)	802.0	1,710.3	1,531.0	2,329.0	2,172.0	1,223.3	14.4
		DEMAND(D=P+I-E)	3,623.1	3,015.7	12,999.2	28,017.8	29,099.9	50,989.0	76,682.0
		SELFSUFF.(%)	2.8	3.9	1.0	0.5	0.6	0.3	0.3
	MAIZE	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	7,932.7	6,457.0	13,421.3	5,313.4	13,616.0	21,641.3	25,860.0
		EXPORT(E)	1,848.5	2,516.1	24.8	0.0	1.0	0.2	603.8
		DEMAND(D=P+I-E)	6,084.2	3,940.9	13,396.5	5,313.4	13,615.0	21,641.1	25,256.3
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	OTHER FEED	PRODUCTION(P)	178,293.0	201,135.0	225,554.0	255,779.0	289,301.0	317,633.0	347,150.0
		IMPORT(I)	25,795.6	24,375.3	49,164.8	37,249.3	53,618.7	20,355.0	18,423.3
		EXPORT(E)	1,576.0	5,246.0	4,293.4	7,950.7	3,451.0	7,749.7	4,889.4
		DEMAND(D=P+I-E)	202,512.6	220,264.3	270,425.3	285,077.5	339,468.7	330,238.3	360,683.9
		SELFSUFF.(%)	88.0	91.3	83.4	89.7	85.2	96.2	96.2
11	OTHERS	PRODUCTION(P)	1,700.0	1,800.0	1,800.0	1,800.0	1,800.0	1,900.0	2,000.0
		IMPORT(I)	2,254.5	2,328.2	2,694.6	2,676.8	2,522.7	7,266.9	4,172.2
		EXPORT(E)	764.9	857.5	706.8	688.2	718.3	972.3	972.4
		DEMAND(D=P+I-E)	3,189.6	3,270.7	3,787.8	3,788.6	3,604.4	8,194.7	5,199.8
		SELFSUFF.(%)	53.3	55.0	47.5	47.5	49.9	23.2	38.5
	TOBACCO	PRODUCTION(P)	1,700.0	1,800.0	1,800.0	1,800.0	1,800.0	1,900.0	2,000.0
		IMPORT(I)	1,835.5	1,753.9	2,031.7	1,663.9	1,777.5	6,458.6	1,485.7
		EXPORT(E)	423.1	424.8	413.1	533.1	573.0	798.4	698.8
		DEMAND(D=P+I-E)	3,112.4	3,129.1	3,418.6	2,930.8	3,004.5	7,560.2	2,786.9
		SELFSUFF.(%)	54.6	57.5	52.7	61.4	59.9	25.1	71.8
	SEEDS	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	289.4	407.0	395.8	548.7	309.2	470.2	2,406.0
		EXPORT(E)	202.8	287.0	93.8	16.8	25.5	150.9	174.4
		DEMAND(D=P+I-E)	86.6	120.0	302.0	531.9	283.7	319.3	2,231.6
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	FLOWERS	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	49.1	37.3	69.8	204.8	241.9	228.9	195.1
		EXPORT(E)	0.0	0.1	0.0	4.4	19.9	23.0	99.2
		DEMAND(D=P+I-E)	49.1	37.2	69.8	200.5	222.1	205.9	95.8
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	OTHERS	PRODUCTION(P)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		IMPORT(I)	80.5	130.0	197.2	259.3	194.0	109.3	85.5
		EXPORT(E)	139.0	145.6	199.9	133.9	100.0	0.0	0.0
		DEMAND(D=P+I-E)	-58.5	-15.6	-2.6	125.5	94.0	109.3	85.5
		SELFSUFF.(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

represents both technical progress and production increases if socio-economic activities are growing at a stable rate. In this case, time and GDP per capita are assumed to correlate. Food, particularly, has little elasticity in terms the ratio of demand to income, namely (dD/D)/(dY/Y), therefore, there are some cases in which the time factor should be adopted as a variable in demand analysis, in order to improve future estimates.

In this study, regression analysis of food demand by crop was carried out to estimate future demands for food in the country. 21 crops, objectively selected based on data availability, were cereals, vegetables, fruits, feeds and others. Naturally, long-term data are indispensable for demand analysis, but only data for the 7 years from 1982-1988 can be utilized, due to the fact that data collection and improvement has just recently started in Oman. With respect to population, aside from the 1.5 million at the end of 1989 determined by the DC, the team utilized World Bank data for past population increase rate: 3.6% per annum from 1965-1980 and 4.6% per annum from 1980-1987. As a regression model, linear regression was adopted owing to its simplicity. The designated variables were: per capita annual demand of food crop as the dependent variable, and time as the independent variable. The formula is:

$$Y = a + bX$$

Y: Demand per capita per annum :Y=(P+M-X)/population
X: Time :X=Year-1,900
a,b: Constant or coefficient

The results of the calculation are shown in Table 2.1.3. Attention should be paid to the results because wastage is not subtracted from domestic production, and basic data, such as population, conversion factors from crop to final food, e.g. wheat to flour, etc., are not authorized. The results should be viewed as approximate.

The regression formulas of each crop which are judged as significant through analysis are:

Bananas: Y=58.14-0.47X (sqr.R=0.73)

Table 2.1.3

Result of Regression Analysis on Domestic Demand for Agricultural Products

Crop	Average Demand (kg/year /capita)	Value (a)	Value (b)	Correlat. Coeffi. (R^2)	F-Value	T-Value (a)	T-Value (b)	Darbin Watson Ratio	Remarks
Banana	18.30	58.14	-0.47	0.73	13.75	5.41	3.71	2.72	significant
Barley	21.70	-679.41	8.25	0.92	57.89	-7.37	7.61	1.65	significant
Cabbage	11.40	-76.02	1.03	0.90	43.23	-5.71	6.58	1.62	significant
Cereal Total	131.50	403.67	-3.18	0.12	0.53	1.08	-0.73	3.52	non-significant
Chili	3.60	-13.30	0.20	0.93	68.79	-6.52	8.29	2.01	significant
Coconuts	4.20	10.67	-0.08	0.64	8.70	4.86	-2.95	1.19	significant
Cucumbers	6.40	-18.91	0.30	0.97	151.57	-9.20	12.31	1.67	significant
Dates	65.50	91.75	-0.31	0.14	0.79	3.10	-0.89	1.37	non-significant
Feeds Total	257.50	-1,627.86	22.18	0.96	114.77	-9.25	10.71	3.29	significant
Garlic	1.00	-4.14	0.06	0.52	5.46	-1.89	2.34	2.15	non-significant
Lime & Lemon	10.80	72.27	-0.72	0.44	3.98	2.35	-1.99	1.96	non-significant
Maize	9.70	-172.58	2.15	0.68	10.81	-3.11	3.29	2.66	significant
Watermelon & Melon	20.40	-74.92	1.12	0.76	15.96	-3.14	4.00	2.06	significant
Onion	5.80	-67.71	0.86	0.61	7.88	-2.59	2.81	1.08	significant
Potato	5.70	-117.78	1.45	0.36	2.82	-1.60	1.68	3.09	non-significant
Rice	61.40	-291.32	4.13	0.73	10.97	-2.74	3.31	2.24	significant
Sugar	13.30	-214.47	2.68	0.61	7.69	-2.61	2.77	1.19	significant
Tobacco	2.90	-4.07	0.08	0.02	0.12	-0.20	0.34	2.86	non-significant
Tomato	14.40	-182.25	2.31	0.83	24.19	-4.56	4.92	1.71	significant
Vegetable Total	102.10	-716.33	9.63	0.82	22.20	-4.12	4.71	1.08	significant
Wheat	67.70	239.08	-2.02	0.07	0.38	0.86	-0.62	3.33	non-significant

Barley:	Y=-679.41+8.25X (sqr.R=0.92)
Cabbage:	Y=-76.02+1.03X (sqr.R=0.90)
Chilis:	Y=-13.3+0.2X (sqr.R=0.93)
Coconuts:	Y=10.67-0.08X (sqr.R=0.64)
Cucumbers:	Y=-18.91+0.3X (sqr.R=0.97)
Feed Total:	Y=-1,627.86+22.18X (sqr.R=0.96)
Maize:	Y=-172.58+2.15X (sqr.R=0.68)
Melons:	Y=-74.92+1.12X (sqr.R=0.76)
Onions:	Y=-67.71+0.86X (sqr.R=0.61)
Rice:	Y=-291.32+4.13X (sqr.R=0.73)
Sugar:	Y=-214.47+2.68X (sqr.R=0.61)
Tomatoes:	Y=-182.25+2.31X (sqr.R=0.83)
Vegetables Total:	Y=-716.33+9.63X (sqr.R=0.82)

The hypothesis test is applied to the results of the regression analysis: this means the judgment of whether the null hypothesis will be refused or accepted, in other words, significant or non-significant. The F value of significance levels 5% and 1% are 6.608 and 16.258, respectively, when data size is 7 and the category number is 2. Also, the T value of significance levels 5% and 1% are 2.571 and 4.032, respectively. Judging from this information, crops such as cereal (total), dates, garlic, limes and lemons, potatoes, tobacco, and wheat, are determined as non-significant because the F values and T values are smaller than the required values to satisfy significance levels. The future demand for these products, therefore, is better estimated either by using a 7-year average annual demand per capita or by adopting an arranged linear model based on expected future income levels or nutrition levels.

To determine the prospect of future demand for each product, average annual demand per capita during the past 7 years was adopted in the case of those products whose results of linear regression analysis were statistically non-significant. In contrast, in the case of products whose results of regression analysis were judged to be statistically significant, the estimated future demand from regression formula was checked and adjusted according to the comparison of per capita calorie supply and per capita consumption demand of Omanis with those of the people in principal countries. Then, the future demand of the product in

the Sultanate was estimated based on the justified regression formula. The details of the calculation process is described in the following section.

2.1.2 Prospects for Demand for Each Product

It is likely that the Omani diet is nearly at a peak now. This is because of rapid increases in income, agricultural production and the availability of imported products. It is evidenced by the fact that per capita calorie supply exceeds 2,800 kcal per day.

In the future, the increase in income will represent gradual and stable growth, and food consumption will remain stable. The diet, however, will shift, little by little, from sheer calorie intake to the consumption of a wider variety of foods. As a result, per capita calorie supply is forecasted to reach 3,000 kcal per day by the year 2000, while maintaining the "Omani-type diet" described in Sub-section 2.1.3. The trend of the annual per capita consumption of each food is presented in Table 2.1.4 - 2.1.7.

(1) Cereals

The consumption of wheat exceeded that of rice several years ago. Recently, however, rice consumption has increased rapidly and surpassed wheat consumption which has remained stable. The gross consumption of cereals indicates a gradual increase, as demonstrated by the increase in rice consumption.

This recent change in the relationship of rice to wheat will remain the same in the future, judging from current Omani tastes. Per capita calorie supply exceeds 2,800 kcal per day, and the per capita gross supply of cereals in Oman is nearly the same as in Italy, Japan and neighboring countries. This will also stabilize in the future.

(2) Vegetables

Table 2.1.4 Trends for Demand and Supply of Foods in Oman (1982 to 1988)

NO.	ITEMS	SUPPLIES FOR DOMESTIC CONSUMPTION (ton)							WASTE PERCENTAGE		SUPPLIES OF GROSS FOOD FOR DOMESTIC CONSUMPTION (ton)						
		1982	1983	1984	1985	1986	1987	1988	DOMESTIC PRODUCTS	IMPORTED PRODUCTS	1982	1983	1984	1985	1986	1987	1988
1	CEREALS	198,373	156,907	170,220	154,978	198,363	138,754	191,765	(%)	(%)	196,492	155,385	168,520	153,406	196,407	137,348	189,843
	RICE	115,372	59,095	73,345	65,904	79,738	90,622	108,848	0.9	0.9	114,331	58,530	72,597	65,275	79,010	89,802	107,850
	WHEAT	76,045	82,276	87,712	76,831	122,007	52,520	95,169	0.9	0.9	75,270	81,460	86,843	75,998	120,815	52,022	94,282
	OTHERS	6,956	15,536	9,164	12,244	-3,382	-4,388	-12,252	0.9	0.9	6,890	15,395	9,080	12,132	-3,418	-4,477	-12,289
2	VEGETABLES	87,744	98,040	112,954	111,999	131,851	162,066	209,599			63,789	70,929	81,915	78,533	93,995	118,312	156,693
	TOMATO	8,457	12,284	15,173	17,630	18,763	22,015	36,154	54.7	10.3	3,146	5,747	7,200	8,447	8,546	9,686	20,092
	ONION	4,800	5,000	5,300	5,800	6,400	9,144	15,564	10.6	10.3	4,381	4,470	4,738	5,185	5,722	8,180	13,937
	CARLIC	900	1,000	1,000	1,000	1,600	1,623	1,502	28.5	10.3	644	715	715	715	1,144	1,243	1,128
	W.+S.MELON	19,203	22,094	22,198	24,292	25,558	33,666	34,667	26.6	10.3	14,024	16,350	16,104	17,435	18,259	25,249	25,548
	CABBAGE	9,700	10,900	12,200	13,300	14,700	19,690	21,342	31.8	10.3	6,615	7,434	8,320	9,071	10,025	14,127	15,265
	CUCUMBER	6,100	6,700	7,300	7,900	8,500	9,755	10,577	35.4	10.3	3,941	4,328	4,716	5,103	5,491	6,442	6,977
	OTHERS	38,484	40,063	49,783	42,077	56,329	66,175	89,794	28.0	10.3	31,038	31,885	40,122	32,577	44,808	53,387	73,743
3	TUBERS	2,438	2,626	2,800	3,626	3,726	14,873	17,016			2,759	6,530	-4,167	14,633	11,526	13,303	15,342
	POTATO	1,940	5,806	-4,590	14,254	10,774	10,824	13,523	15.4	5.8	1,712	5,323	-5,520	13,089	9,812	9,697	12,285
	OTHERS	1,238	1,426	1,600	1,826	2,026	4,048	3,493	15.4	5.8	1,047	1,206	1,354	1,545	1,714	3,606	3,057
4	BEANS,NUTS	700	844	754	613	562	509	2,279			685	827	738	599	548	499	2,233
	SOYBEAN	0	0	0	0	0	80	1,049	2.0	2.0	0	0	0	0	0	79	1,028
	GROUNDNUTS	-0	0	-1	0	-2	56	30	2.0	2.0	-0	0	-1	0	-2	55	29
	OTHERS	700	844	754	613	563	373	1,200	2.0	2.0	685	827	739	599	549	365	1,176
5	FRUITS	157,675	180,812	171,549	180,553	185,771	176,343	179,390			127,501	146,803	138,132	145,042	149,253	141,308	141,868
	DATES	74,739	76,569	75,706	81,320	83,367	89,311	95,195	21.6	16.4	58,265	59,737	58,359	62,697	64,429	69,249	73,583
	LIME,LEMON	12,829	14,743	13,662	13,829	14,872	16,213	8,159	12.6	12.6	10,303	12,048	10,886	10,869	11,646	13,010	4,801
	OTHER CITRUS	8,996	18,673	10,454	12,509	12,830	10,370	11,373	18.7	16.4	7,518	15,610	8,738	10,457	10,726	8,626	9,496
	BANANA	21,390	21,686	23,026	23,299	24,200	22,232	24,706	12.2	12.2	18,770	19,036	20,207	20,433	21,205	19,481	21,663
	COCONUTS	5,000	5,000	5,000	5,100	5,200	5,720	5,813	18.7	16.4	4,065	4,065	4,065	4,146	4,228	4,631	4,703
	GRAPE	3,425	3,448	3,496	5,666	6,387	4,842	4,966	18.7	16.4	2,861	2,880	2,920	4,734	5,336	4,044	4,142
	PAPAYA	1,032	1,188	1,333	1,521	1,688	1,766	2,000	46.2	16.4	555	639	717	818	908	952	1,075
	OTHERS	30,364	39,505	38,872	37,308	37,225	25,888	27,177	18.7	16.4	25,164	32,788	32,239	30,888	30,776	21,315	22,405
6	SUGAR	17,666	25,292	37,730	22,007	24,771	28,254	38,322	0.0	0.0	17,666	25,292	37,730	22,007	24,771	28,254	38,322
7	OIL	9,154	12,818	14,538	18,089	15,127	19,244	20,541	0.0	0.0	9,154	12,818	14,538	18,089	15,127	19,244	20,541
8	SAUCE,SPICES	5,915	6,923	6,748	7,412	7,523	9,299	8,689			5,230	6,096	5,820	6,382	6,384	8,005	7,335
	CHILLI PEPPER	3,117	3,834	4,154	4,609	5,013	5,636	5,847	23.8	10.3	2,432	3,007	3,226	3,579	3,873	4,343	4,492
	SPICE	2,098	1,725	1,616	1,961	1,516	1,528	1,861	0.0	0.0	2,098	1,725	1,616	1,961	1,516	1,528	1,861
	SAUCE	700	1,364	978	842	994	2,135	981	0.0	0.0	700	1,364	978	842	994	2,135	981
9	BEVERAGES	32,146	39,132	51,693	43,299	33,938	20,856	8,971			32,146	39,132	51,693	43,299	33,938	20,856	8,971
	COFFEE	2,708	2,610	2,822	2,725	2,186	2,868	3,925	0.0	0.0	2,708	2,610	2,822	2,725	2,186	2,869	3,925
	TEA,MATE	1,319	1,436	1,987	1,766	1,472	1,567	1,521	0.0	0.0	1,319	1,436	1,987	1,766	1,472	1,567	1,521
	COCOA	7	6	10	4	6	1	8	0.0	0.0	7	6	10	4	6	1	8
	OTHERS	28,113	35,080	46,875	38,805	30,273	16,419	3,518	0.0	0.0	28,113	35,080	46,875	38,805	30,273	16,419	3,518
10	OTHER FOODS	3,528	4,504	-1,320	9,212	8,935	10,048	9,516	0.0	0.0	3,528	4,504	-1,320	9,212	8,935	10,048	9,516
11	FISH	77,914	95,360	88,414	82,856	79,120	100,220	82,770	0.0	0.0	77,914	95,360	88,414	82,856	79,120	100,220	82,770
12	ANIMAL PRODUCTS										151,507	161,560	180,476	184,449	219,954	204,325	195,714
	MILK	106,524	110,235	120,253	120,502	153,182	144,644	131,804	2.0	2.0	104,394	108,030	117,848	118,092	150,118	141,751	129,168
	BUTTER	5,941	5,230	4,676	5,487	4,930	5,227	5,481	0.0	0.0	5,941	5,230	4,676	5,487	4,930	5,227	5,481
	CHEESE	1,700	2,134	2,295	2,526	2,652	1,849	2,152	0.0	0.0	1,700	2,134	2,295	2,526	2,652	1,849	2,152
	MUTTON	14,742	15,604	17,728	18,179	19,598	17,015	16,828	1.2	1.2	14,565	15,417	17,515	17,961	19,363	16,811	16,626
	BEEF	3,894	3,924	4,438	5,184	5,537	5,183	6,057	1.2	1.2	3,847	3,877	4,385	5,122	5,471	5,121	5,984
	CHICKEN	16,600	20,000	26,000	26,500	27,400	24,495	26,443	1.2	1.2	16,401	19,760	25,688	26,182	27,071	24,201	26,126
	EGG	4,750	7,250	8,225	9,255	10,550	9,547	10,374	1.9	1.9	4,660	7,112	8,069	9,079	10,350	9,365	10,177
	TOTAL																

Source: Estimation by the JICA study team.

Table 2.1.4 (Continued)

NO.	ITEMS	SUPPLIES OF GROSS FOOD PER CAPITA(kg/year)							NET RATIO (%)	SUPPLIES OF NET FOOD PER CAPITA (kg/year)							DAILY CALORIE SUPPLIES PER CAPITA (kcal/day)						
		1982	1983	1984	1985	1986	1987	1988		1982	1983	1984	1985	1986	1987	1988	1982	1983	1984	1985	1986	1987	1988
1	CEREALS	179.5	135.7	140.7	122.4	149.8	100.2	132.4		161.5	122.1	126.6	110.2	134.9	90.2	119.1	1,596	1,213	1,257	1,094	1,342	890	1,181
	RICE	104.4	51.1	60.6	52.1	60.3	65.5	75.2	90.0	94.0	46.0	54.5	46.9	54.3	59.0	67.7	917	449	532	457	529	575	660
	WHEAT	68.7	71.1	72.5	60.7	92.2	37.9	65.7	90.0	61.9	64.0	65.2	54.6	83.0	34.2	59.2	624	645	658	550	836	344	597
	OTHERS	6.3	13.4	7.6	9.7	-2.6	-3.3	-8.6	90.0	5.7	12.1	6.8	8.7	-2.3	-2.9	-7.7	56	119	67	86	-23	-29	-76
2	VEGETABLES	58.3	51.9	68.4	62.7	71.7	86.3	109.3		47.4	50.4	56.2	51.4	59.1	70.6	91.4	37	38	42	38	45	54	68
	TOMATO	2.9	5.0	6.0	6.7	6.5	7.1	14.0	95.0	2.7	4.8	5.7	6.4	6.2	6.7	13.3	1	2	3	3	3	3	6
	ONION	4.0	3.9	4.0	4.1	4.4	6.0	9.7	95.0	3.8	3.7	3.8	3.9	4.1	5.7	9.2	4	4	4	4	4	5	9
	GARLIC	0.6	0.6	0.6	0.6	0.9	0.9	0.8	80.0	0.5	0.5	0.5	0.5	0.7	0.7	0.6	2	2	2	2	3	3	2
	W.+S.MELON	12.8	14.3	13.4	13.9	13.9	18.4	17.8	60.0	7.7	8.6	8.1	8.3	8.4	11.0	10.7	8	9	8	8	8	11	11
	CABBAGE	6.0	6.5	6.9	7.2	7.6	10.3	10.6	85.0	5.1	5.5	5.9	6.2	6.5	8.8	9.0	3	4	4	4	4	6	6
	CUCUMBER	3.6	3.8	3.9	4.1	4.2	4.7	4.9	98.0	3.5	3.7	3.9	4.0	4.1	4.6	4.8	1	1	1	1	1	1	1
	OTHERS	28.3	27.8	33.5	26.0	34.2	38.9	51.4	85.0	24.1	23.7	28.5	22.1	29.1	33.1	43.7	18	18	21	16	21	24	32
3	TUBERS	2.5	5.7	-3.5	11.7	8.8	9.7	10.7		2.3	5.1	-3.1	10.5	7.9	8.7	9.6	5	11	-6	23	17	19	21
	POTATO	1.6	4.6	-4.6	10.4	7.5	7.1	8.6	90.0	1.4	4.2	-4.1	9.4	6.7	6.4	7.7	3	9	-9	20	14	13	16
	OTHERS	1.0	1.1	1.1	1.2	1.3	2.6	2.1	90.0	0.9	0.9	1.0	1.1	1.2	2.4	1.9	2	2	2	3	3	6	5
4	BEANS,NUTS	0.6	0.7	0.6	0.5	0.4	0.4	1.6		0.6	0.7	0.6	0.5	0.4	0.4	1.6	7	8	7	6	5	4	18
	SOYBEAN	0.0	0.0	0.0	0.0	0.0	0.1	0.7	100.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0	0	0	0	0	1	9
	GROUNDNUTS	-0.0	0.0	-0.0	0.0	-0.0	0.0	0.0	100.0	-0.0	0.0	-0.0	0.0	-0.0	0.0	0.0	0	0	0	0	0	0	0
	OTHERS	0.6	0.7	0.6	0.5	0.4	0.3	0.8	100.0	0.6	0.7	0.6	0.5	0.4	0.3	0.8	7	8	7	6	5	3	9
5	FRUITS	116.4	128.2	115.3	115.8	113.9	103.1	98.9		94.8	103.8	93.0	93.8	92.4	85.1	80.8	363	369	341	348	342	336	336
	DATES	53.2	52.2	48.7	50.0	49.2	50.5	51.3	95.0	50.6	49.6	46.3	47.5	46.7	48.0	48.7	295	289	270	277	273	280	284
	LIME,LEMON	9.4	10.5	9.1	8.7	8.9	9.5	3.3	97.0	9.1	10.2	8.8	8.4	8.6	9.2	3.2	9	10	9	9	9	9	3
	OTHER CITRUS	6.9	13.6	7.3	8.3	8.2	6.3	6.6	80.0	5.5	10.9	5.8	6.7	6.5	5.0	5.3	6	12	6	7	7	5	6
	BANANA	17.1	16.6	16.9	16.3	16.2	14.2	15.1	62.0	10.6	10.3	10.5	10.1	10.0	8.8	9.4	25	25	25	24	24	21	22
	COCONUTS	3.7	3.5	3.4	3.3	3.2	3.4	3.3	14.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0
	GRAPE	2.6	2.5	2.4	3.8	4.1	2.9	2.9	75.0	2.0	1.9	1.8	2.8	3.1	2.2	2.2	3	3	3	4	5	3	3
	PAPAYA	0.5	0.6	0.6	0.7	0.7	0.7	0.7	75.0	0.4	0.4	0.4	0.5	0.5	0.5	0.6	1	1	1	1	1	1	1
	OTHERS	23.0	28.6	26.9	24.7	23.5	15.5	15.6	70.0	16.1	20.0	18.8	17.3	16.4	10.9	10.9	24	29	28	25	24	16	16
6	SUGAR	16.1	22.1	31.5	17.6	18.9	20.6	26.7	100.0	16.1	22.1	31.5	17.6	18.9	20.6	26.7	169	232	331	184	198	216	280
7	OIL	8.4	11.2	12.1	14.4	11.5	14.0	14.3	100.0	8.4	11.2	12.1	14.4	11.5	14.0	14.3	212	283	307	366	292	355	363
8	SAUCE,SPICES	4.8	5.3	4.9	5.1	4.9	5.8	5.1		4.8	5.3	4.9	5.1	4.9	5.8	5.1	23	25	20	21	18	25	19
	CHILLI PEPPER	2.2	2.6	2.7	2.9	3.0	3.2	3.1	100.0	2.2	2.6	2.7	2.9	3.0	3.2	3.1	2	2	2	3	3	3	3
	SPICE	1.9	1.5	1.3	1.6	1.2	1.1	1.3	100.0	1.9	1.5	1.3	1.6	1.2	1.1	1.3	16	12	11	13	10	9	11
	SAUCE	0.6	1.2	0.8	0.7	0.8	1.6	0.7	100.0	0.6	1.2	0.8	0.7	0.8	1.6	0.7	5	10	7	6	6	13	6
9	BEVERAGES	29.4	34.2	43.2	34.6	25.9	15.2	6.3		29.4	34.2	43.2	34.6	25.9	15.2	6.3	0	0	0	0	0	0	0
	COFFEE	2.5	2.3	2.4	2.2	1.7	2.1	2.7	100.0	2.5	2.3	2.4	2.2	1.7	2.1	2.7	0	0	0	0	0	0	0
	TEA,MATE	1.2	1.3	1.7	1.4	1.1	1.1	1.1	100.0	1.2	1.3	1.7	1.4	1.1	1.1	1.1	0	0	0	0	0	0	0
	COCOA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
	OTHERS	25.7	30.6	39.1	31.0	23.1	12.0	2.5	100.0	25.7	30.6	39.1	31.0	23.1	12.0	2.5	0	0	0	0	0	0	0
10	OTHER FOODS	3.2	3.9	-1.1	7.4	6.8	7.3	6.6	83.0	2.7	3.3	-0.9	6.1	5.7	6.1	5.5	11	14	-4	26	24	26	23
11	FISH	71.2	83.3	73.8	66.1	60.4	73.1	57.7	51.0	36.3	42.5	37.6	33.7	30.8	37.3	29.4	133	155	138	123	113	136	108
12	ANIMAL PRODUCTS	138.4	141.1	150.7	147.2	167.8	149.0	136.5		129.3	131.2	139.4	135.9	156.4	139.3	126.6	435	435	453	458	482	429	411
	MILK	95.3	94.3	98.4	94.2	114.5	103.4	90.1	100.0	95.3	94.3	98.4	94.2	115	103	90.1	157	155	162	155	188	170	148
	BUTTER	5.4	4.6	3.9	4.4	3.8	3.8	3.8	100.0	5.4	4.6	3.9	4.4	3.8	3.8	3.8	113	95	81	91	78	79	79
	CHEESE	1.6	1.9	1.9	2.0	2.0	1.3	1.5	100.0	1.6	1.9	1.9	2.0	2.0	1.3	1.5	17	21	21	22	23	15	17
	MUTTON	13.3	13.5	14.6	14.3	14.8	12.3	11.6	70.0	9.3	9.4	10.2	10.0	10.3	8.6	8.1	60	61	66	65	67	55	52
	BEEF	3.5	3.4	3.7	4.1	4.2	3.7	4.2	70.0	2.5	2.4	2.6	2.9	2.9	2.6	2.9	17	16	18	20	20	18	20
	CHICKEN	15.0	17.3	21.4	20.9	20.7	17.7	18.2	77.0	11.5	13.3	16.5	16.1	15.9	13.6	14.0	55	64	79	77	76	65	67
	EGG	4.3	6.2	6.7	7.2	7.9	6.8	7.1	87.0	3.7	5.4	5.9	6.3	6.9	5.9	6.2	16	24	26	28	30	26	27
	TOTAL																2,992	2,784	2,886	2,685	2,879	2,491	2,828

Table 2.1.4 (Continued)

NO.	ITEMS	DAILY PROTEIN SUPPLIES PER CAPITA (g/day)							DAILY FAT SUPPLIES PER CAPITA (g/day)							CALOLIE/ NET FOOD (kcal/100g)	PROTEIN CONTENTS (%)	FAT CONTENTS (%)
		1982	1983	1984	1985	1986	1987	1988	1982	1983	1984	1985	1986	1987	1988			
1	CEREALS	37.4	30.5	31.3	27.1	34.6	20.6	28.7	7.2	5.9	6.0	5.2	6.6	3.9	5.5			
	RICE	17.5	8.6	10.2	8.7	10.1	11.0	12.6	3.3	1.6	1.9	1.7	1.9	2.1	2.4	356.0	6.8	1.3
	WHEAT	18.6	19.3	19.7	16.5	25.0	10.3	17.8	3.6	3.7	3.8	3.1	4.8	2.0	3.4	368.0	11.0	2.1
	OTHERS	1.3	2.7	1.5	1.9	-0.5	-0.7	-1.7	0.2	0.5	0.3	0.4	-0.1	-0.1	-0.3	359.6	8.1	1.6
2	VEGETABLES	1.6	1.7	1.9	1.7	2.0	2.4	3.0	0.4	0.4	0.5	0.4	0.5	0.6	0.7			
	TOMATO	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.0	0.7	0.1
	ONION	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.0	1.0	0.1
	GARLIC	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	138.0	8.4	0.1
	W.+S.MELON	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	37.0	0.7	1.1
	CABBAGE	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.0	1.4	0.1
	CUCUMBER	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	1.0	0.2
	OTHERS	0.9	0.9	1.1	0.8	1.1	1.3	1.7	0.1	0.1	0.2	0.1	0.2	0.2	0.2	27.0	1.4	0.2
3	TUBERS	0.1	0.3	-0.2	0.6	0.4	0.5	0.5	0.0	0.0	-0.0	0.1	0.0	0.0	0.1			
	POTATO	0.1	0.2	-0.2	0.5	0.4	0.3	0.4	0.0	0.0	-0.0	0.1	0.0	0.0	0.0	77.0	2.0	0.2
	OTHERS	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	87.8	1.8	0.2
4	BEANS,NUTS	0.5	0.6	0.5	0.4	0.3	0.3	1.3	0.4	0.4	0.4	0.3	0.2	0.2	0.9			
	SOYBEAN	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	433.0	33.6	20.6
	GROUNDNUTS	-0.0	0.0	-0.0	0.0	-0.0	0.0	0.0	-0.0	0.0	-0.0	0.0	-0.0	0.1	0.0	561.0	25.4	47.4
	OTHERS	0.5	0.6	0.5	0.4	0.3	0.2	0.7	0.4	0.4	0.4	0.3	0.2	0.2	0.5	420.9	29.8	21.3
5	FRUITS	3.4	3.5	3.2	3.2	3.2	3.1	3.0	0.4	0.5	0.5	0.5	0.4	0.4	0.3			
	DATES	2.4	2.3	2.2	2.2	2.2	2.2	2.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	213.0	1.7	0.1
	LIME,LEMON	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.0	0.8	0.1
	OTHER CITRUS	0.1	0.3	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.5	0.9	0.1
	BANANA	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	87.0	1.1	0.1
	COCONUTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	0.2	0.1
	GRAPE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.0	0.5	0.2
	PAPAYA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.0	0.6	0.2
	OTHERS	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	53.5	0.7	0.5
6	SUGAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	383.1	0.0	0.0
7	OIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.9	30.7	33.2	39.6	31.6	38.5	39.2	924.3	0.0	100.0
8	SAUCE,SPICES	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3			
	CHILLI PEPPER	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	33.0	1.4	1.2
	SPICE	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	300.0	5.0	5.0
	SAUCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	300.0	1.0	0.1
9	BEVERAGES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	COFFEE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TEA,MATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	COCOA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	277.0	18.9	21.6
	OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	OTHER FOODS	0.9	1.1	-0.3	2.0	1.8	2.0	1.8	0.5	0.6	-0.2	1.1	1.0	1.0	1.0	155.2	11.9	6.3
11	FISH	18.8	21.8	19.3	17.3	15.8	19.1	15.1	5.8	6.7	6.0	5.4	4.9	5.9	4.7	133.4	18.7	5.8
12	ANIMAL PRODUCTS	21.8	23.4	26.2	25.9	27.8	23.9	23.2	32.1	31.3	31.7	32.6	33.3	30.0	29.0			
	MILK	7.6	7.5	7.8	7.5	9.1	8.2	7.2	8.6	8.5	8.9	8.5	10.4	9.3	8.1	60.0	2.9	3.3
	BUTTER	0.1	0.1	0.1	0.1	0.1	0.1	0.1	12.2	10.3	8.8	9.9	8.5	8.6	8.6	757.0	0.6	82.3
	CHEESE	1.0	1.2	1.2	1.3	1.3	0.8	0.9	1.4	1.6	1.7	1.8	1.8	1.2	1.3	406.0	22.7	31.9
	MUTTON	4.6	4.6	5.0	4.9	5.1	4.2	4.0	4.3	4.4	4.8	4.7	4.8	4.0	3.8	236.0	17.9	17.0
	BEEF	1.2	1.2	1.3	1.4	1.5	1.3	1.5	1.2	1.2	1.3	1.5	1.5	1.3	1.5	251.0	18.2	18.5
	CHICKEN	6.2	7.1	8.8	8.6	8.5	7.3	7.5	3.1	3.6	4.5	4.4	4.3	3.7	3.8	175.0	19.5	9.9
	EGG	1.2	1.8	2.0	2.1	2.3	2.0	2.1	1.1	1.7	1.8	1.9	2.1	1.8	1.9	162.0	12.3	11.2
	TOTAL	84.7	83.2	82.2	78.5	86.3	72.2	77.0	69.9	76.8	78.3	85.3	78.9	80.8	81.7			

Table 2.1.5 Food and Calorie Supply in Neighboring Countries

		supply amount per capita (kg/year)				calorie supply per capita (kcal/day)			
		Egypt	Kuwait	Saudi Arabia	U.A.E.	Egypt	Kuwait	Saudi Arabia	U.A.E.
1	cereals	253.4	171.3	166.0	133.6	2032	1265	1314	1006
	wheat	148.3	87.7	86.3	62.2	1173	709	719	527
	rice	46.3	81.8	56.2	68.6	316	538	396	451
	others	58.8	1.8	23.5	2.8	543	18	199	28
2	roots and tubers	23.5	18.0	10.2	14.7	48	34	20	28
	potatoes	19.7	18.0	9.9	14.7	38	34	19	28
	sweet potatoes	1.9				5			
	others	1.9	0.0	0.3	0.0	5	0	1	0
3	sugars and honey	59.1	49.7	29.0	41.7	322	475	277	399
4	pulses	7.2	5.9	3.2	5.7	68	56	30	53
5	nuts and oilseeds	1.9	6.2	7.5	12.3	20	45	70	58
6	vegetables	145.4	150.0	111.6	195.2	90	99	72	144
	tomatoes	51.8	40.0	33.5	57.6	28	23	19	34
	dry onions	12.9	16.5	16.1	49.2	14	17	17	50
	garlic	3.6	1.5	0.4	2.3	12	5	1	8
	watermelons	25.5		28.5	17.4	8		10	6
	melons	3.7	29.7	3.0	8.7	1	11	1	3
	cabbages	7.8		1.1	4.4	3		1	2
	cucumbers	6.1	5.0	0.8	4.0	2	1		1
	eggplants	6.3	2.8	2.9	5.8	4	2	2	3
	carrots	2.8		0.5	1.0	2		1	1
	squashes,pumpkins	9.8	1.1	5.5	5.6	5	1	3	4
	cauliflowers	2.1	1.6		3.0	1	1		1
	others	13.0	51.8	19.3	36.2	10	38	17	31
7	fruits	46.8	106.9	158.6	137.9	80	146	305	248
	dates	8.9	3.2	37.8	31.9	38	11	200	111
	lemon,limes	1.4	5.2	3.9	5.1	1	4	2	3
	oranges	18.2	25.5	14.9	23.3	15	22	10	20
	mandarines	1.7		2.3		2		2	
	grapefruits		0.6						
	bananas	2.9	17.7	12.7	20.7	5	32	22	38
	grapes	6.1	4.6	9.8	6.6	10	8	11	11
	mangoes	2.2		0.5	4.5	2		1	5
	apples	0.8	14.8	8.6	13.5	1	20	10	18
	others	4.6	35.3	68.1	32.3	6	49	47	42
8	meat and offals	15.3	79.2	48.6	68.8	74	385	227	310
9	eggs	1.8	13.6	3.6	16.5	6	54	14	65
10	fish and seafoods	4.9	10.3	9.2	24.7	9	20	17	52
11	milk	20.9	166.9	116.4	138.2	47	296	211	240
12	oils and fats	16.5	16.2	13.0	24.4	366	368	305	532
13	spices	4.5	2.4	2.3	7.1	11	27	17	54
	green chillies	3.7		0.5	1.5	4			1
	others	0.8	2.4	1.8	5.6	7	27	17	53
14	stimulants	0.8	24.4	39.4	13.0	1	75	58	34
15	alcoholic bev.	1.0				1			
	TOTAL					3175	3344	2940	3224

source: FAO "FOOD BALANCE SHEETS, 1979-81 AVERAGE", 1984

Table 2.1.6 Annual Food Supplies Per Capita in Various Countries (kg/year)

COUNTRY	YEAR	CEREALS	TUBERS STARCH	SUGARS	PULSES	VEGETA-BLES	FRUITS	MEATS	EGGS	MILK	FISH	OILS
AUSTRALIA	1985	60.1	58.3	47.8	4.6	78.9	94.4	107.8	11.2	304.6	8.1	16.2
CANADA	1985	72.6	68.1	44.0	6.4	84.3	87.8	96.5	11.9	291.1	7.2	20.9
DENMARK	1985	74.1	64.9	36.2	2.9	72.8	52.8	83.1	16.3	331.0	45.6	28.1
FRANCE	1983	85.2	76.7	34.7	3.4	112.9	78.3	108.8	14.7	357.1	18.1	22.0
WEST GERMANY	1985	76.7	78.2	42.0	4.3	80.7	108.6	99.8	17.0	315.6	6.4	19.0
ITALY	1985	120.0	35.7	27.1	7.1	151.6	113.1	83.8	10.9	278.8	8.1	26.5
NETHERLANDS	1985	63.8	86.8	41.4	9.9	63.4	152.2	79.3	11.7	310.0	10.4	35.4
SPAIN	1985	83.0	111.1	33.6	9.0	131.2	150.0	74.6	16.5	194.8	25.4	26.3
SWEDEN	1985	76.2	70.3	43.4	3.0	46.6	71.9	58.9	11.9	391.3	17.4	31.9
SWITZERLAND	1985	69.1	46.5	38.5	6.3	90.6	111.2	86.0	12.4	422.4	7.0	14.6
UNITED KINGDOM	1985	86.6	110.2	37.3	3.4	96.4	51.0	74.3	13.5	294.5	15.0	29.3
U.S.A.	1985	68.8	31.0	70.1	6.9	98.6	69.6	117.5	15.1	261.3	7.1	31.2
JAPAN	1987	105.2	37.1	21.5	9.7	129.4	54.2	38.1	18.6	75.5	71.5	14.1
EGYPT	1979-'81	228.1	23.5	59.1	7.2	145.4	46.8	15.3	1.8	20.9	4.9	16.5
KUWAIT	1979-'81	154.2	18.0	49.7	5.9	150.0	106.9	79.2	13.6	166.9	10.3	16.2
SAUDI ARABIA	1979-'81	149.4	10.2	29.0	3.2	111.6	158.6	48.6	3.6	116.4	9.2	13.0
U.A.E.	1979-'81	120.2	14.7	41.7	5.7	195.2	137.9	68.8	16.5	138.2	24.7	24.4
OMAN	1988	119.1	10.7	26.7	1.6	109.3	98.9	34.0	7.1	95.4	57.7	14.3

source:
1)OECD "Food Consumption Statistics"
2)Ministry of Agriculture, Forestry and Fisheries of JAPAN "Food Balance Sheets, 1987"
3)FAO "Food Balance Sheets, 1979-81 Average"
4)Royal Oman Police "Foreign Trade Statistics, 1988"
5)MAF of OMAN, Department of Agricultural Statistics

explanatory notes:
1)Values for cereals, pulses and oils are those of net foods, and others are those of gross foods
2)Milk includes butter and other food made from milk, and the amounts were converted into those of fresh milk
3)Values for EGYPT, KUWAIT, SAUDI ARABIA and U.A.E. are average values of '79, '80 and '81. These correspond to Table 2.1.5.

Table 2.1.7 Prospects for Demand for Foods in Oman

NO.	ITEMS	DEMANDS FOR DOMESTIC CONSUMPTION (TON)			WASTAGE PERCENTAGE (%) DOMESTIC		2000 & IMPORTED	DEMANDS FOR GROSS FOOD (TON)		
		1988	1995	2000	1988	1995		1988	1995	2000
1	CEREALS	191,765	264,455	314,077				189,843	262,075	311,250
	RICE	108,848	139,815	166,049	0.9	0.9	0.9	107,850	138,557	164,555
	WHEAT	95,169	124,641	148,028	0.9	0.9	0.9	94,282	123,519	146,695
	OTHERS	-12,252	0	0	0.9	0.9	0.9	-12,289	0	0
2	VEGETABLES	209,599	262,785	312,767				156,693	214,057	280,552
	TOMATO	36,154	35,570	37,407	54.7	28.1	10.3	20,092	25,589	33,554
	ONION	15,564	19,122	25,040	10.6	10.4	10.3	13,937	17,129	22,461
	GARLIC	1,502	1,581	1,725	28.5	17.6	10.3	1,128	1,303	1,547
	W.+S.MELON	34,667	45,794	55,683	26.6	16.8	10.3	25,549	38,091	49,947
	CABBAGE	21,342	28,333	33,589	31.8	18.9	10.3	15,265	22,978	30,130
	CUCUMBER	10,577	13,047	15,192	35.4	20.1	10.3	6,977	10,393	13,628
	OTHERS TOTAL	89,794	119,338	144,131				73,743	98,573	129,285
	OKRA	700	784	947	28.0	17.4	10.3	504	648	849
	EGGPLANT	10,096	11,314	13,664	28.0	17.4	10.3	7,269	9,345	12,257
	CARROTS	6,620	7,419	8,960	28.0	17.4	10.3	4,766	6,128	8,037
	RADISH	18,930	21,213	25,620	28.0	17.4	10.3	13,630	17,522	22,981
	SQUASH	3,786	4,243	5,124	28.0	17.4	10.3	2,726	3,505	4,596
	CAULIFLOWER	2,000	2,241	2,707	28.0	17.4	10.3	1,440	1,851	2,428
	OTHERS	47,662	72,124	87,108	28.0	17.4	10.3	43,408	59,574	78,136
3	TUBERS	17,016	19,382	22,754				15,342	17,513	21,434
	POTATO	13,523	13,702	15,610	15.4	9.6	5.8	12,285	12,381	14,705
	OTHERS	3,493	5,679	7,144	15.4	9.6	5.8	3,057	5,132	6,729
4	BEANS,NUTS	2,279	1,285	1,526				2,233	1,259	1,496
	SOYBEAN	1,049	208	247	2.0	2.0	2.0	1,028	204	242
	GROUNDNUTS	30	16	19	2.0	2.0	2.0	29	15	18
	OTHERS	1,200	1,061	1,260	2.0	2.0	2.0	1,176	1,040	1,235
5	FRUITS	179,390	245,227	284,346				141,868	203,435	239,872
	DATES	95,195	114,751	132,892	21.6	18.5	16.4	73,583	93,545	111,098
	LIME,LEMON	8,159	17,907	21,268	12.6	12.6	12.6	4,801	15,651	18,588
	OTHER CITRUS	11,373	18,235	21,419	18.7	17.3	16.4	9,496	15,077	17,906
	BANANA	24,706	28,477	32,162	12.2	12.2	12.2	21,663	25,003	28,239
	COCONUTS	5,813	6,157	6,386	18.7	17.3	16.4	4,703	5,091	5,339
	GRAPE	4,966	6,771	7,953	18.7	17.3	16.4	4,142	5,598	6,649
	PAPAYA	2,000	2,642	3,202	46.2	28.3	16.4	1,075	1,894	2,677
	OTHERS TOTAL	27,177	50,286	59,064				22,405	41,576	49,377
	MANGO	10,646	13,461	15,811	18.7	17.3	16.4	8,655	11,130	13,218
	OTHERS	16,531	36,824	43,253	18.7	17.3	16.4	13,750	30,446	36,159
6	SUGAR	38,322	40,439	48,026	0.0	0.0	0.0	38,322	40,439	48,026
7	OIL	20,541	32,340	42,406	0.0	0.0	0.0	20,541	32,340	42,406
8	SAUCE,SPICES	8,689	11,667	14,041				7,335	10,356	12,981
	CHILLI PEPPER	5,847	8,352	10,292	23.8	15.7	10.3	4,492	7,040	9,232
	SPICE	1,861	1,651	1,773	0.0	0.0	0.0	1,861	1,651	1,773
	SAUCE	981	1,664	1,977	0.0	0.0	0.0	981	1,664	1,977
9	BEVERAGES	8,971	49,690	59,485				8,971	49,690	59,485
	COFFEE	3,925	5,102	6,690	0.0	0.0	0.0	3,925	5,102	6,690
	TEA,MATE	1,521	1,394	1,497	0.0	0.0	0.0	1,521	1,394	1,497
	COCOA	8	9	10	0.0	0.0	0.0	8	9	10
	OTHERS	3,518	43,184	51,287	0.0	0.0	0.0	3,518	43,184	51,287
10	OTHER FOODS	9,516	9,006	10,696	0.0	0.0	0.0	9,516	9,006	10,696
11	FISH	82,770	127,905	151,905	0.0	0.0	0.0	82,770	127,905	151,905
12	ANIMAL PRODUCTS	199,139	277,221	329,626				195,714	272,452	323,918
	MILK	131,804	184,400	219,000	2.0	2.0	2.0	129,168	180,712	214,620
	BUTTER	5,481	5,477	5,757	0.0	0.0	0.0	5,481	5,477	5,757
	CHEESE	2,152	2,821	3,350	0.0	0.0	0.0	2,152	2,821	3,350
	MUTTON	16,828	25,226	29,961	1.2	1.2	1.2	16,626	24,960	29,643
	BEEF	6,057	8,946	11,731	1.2	1.2	1.2	5,984	8,839	11,591
	CHICKEN	26,443	36,901	43,827	1.2	1.2	1.2	26,126	36,437	43,274
	EGG	10,374	13,450	16,000	1.9	1.9	1.9	10,177	13,205	15,683
	TOTAL									

Source: Estimation by the JICA study team.

Table 2.1.7 (Continued)

NO.	ITEMS	DEMANDS FOR GROSS FOOD PER CAPITA (kg/year)			NET RATIO	DEMANDS FOR NET FOOD PER CAPITA (kg/year)			CALORIES PER CAPITA (kcal/day)		
		1988	1995	2000	(%)	1988	1995	2000	1988	1995	2000
1	CEREALS	132.4	142.1	142.1		119.1	127.9	127.9	1,181	1,267	1,267
	RICE	75.2	75.1	75.1	90.0	67.7	67.6	67.6	660	660	660
	WHEAT	65.7	67.0	67.0	90.0	59.2	60.3	60.3	597	608	608
	OTHERS	-8.6	0.0	0.0	90.0	-7.7	0.0	0.0	-76	0	0
2	VEGETABLES	109.3	116.1	128.1		91.4	96.5	106.5	68	71	78
	TOMATO	14.0	13.9	15.3	95.0	13.3	13.2	14.6	6	6	6
	ONION	9.7	9.3	10.3	95.0	9.2	8.8	9.7	9	8	9
	GARLIC	0.8	0.7	0.7	80.0	0.6	0.6	0.6	2	2	2
	W.+S.MELON	17.8	20.7	22.8	60.0	10.7	12.4	13.7	11	13	14
	CABBAGE	10.6	12.5	13.8	85.0	9.0	10.6	11.7	6	7	8
	CUCUMBER	4.9	5.6	6.2	98.0	4.8	5.5	6.1	1	2	2
	OTHERS TOTAL	51.4	53.5	59.0	85.0	43.7	45.4	50.2	32	34	37
	OKRA	0.4	0.4	0.4	85.0	0.3	0.3	0.3	—	—	—
	EGGPLANT	5.1	5.1	5.6	85.0	4.3	4.3	4.8	—	—	—
	CARROTS	3.3	3.3	3.7	85.0	2.8	2.8	3.1	—	—	—
	RADISH	9.5	9.5	10.5	85.0	8.1	8.1	8.9	—	—	—
	SQUASH	1.9	1.9	2.1	85.0	1.6	1.6	1.8	—	—	—
	CAULIFLOWER	1.0	1.0	1.1	85.0	0.9	0.9	0.9	—	—	—
	OTHERS	30.3	32.3	35.7	85.0	25.7	27.5	30.3	—	—	—
3	TUBERS	10.7	9.5	9.8		9.6	8.5	8.8	21	19	19
	POTATO	8.6	6.7	6.7	90.0	7.7	6.0	6.0	16	13	13
	OTHERS	2.1	2.8	3.1	90.0	1.9	2.5	2.8	5	6	7
4	BEANS,NUTS	1.6	0.7	0.7		1.6	0.7	0.7	18	8	8
	SOYBEAN	0.7	0.1	0.1	100.0	0.7	0.1	0.1	9	1	1
	GROUNDNUTS	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0	0	0
	OTHERS	0.8	0.6	0.6	100.0	0.8	0.6	0.6	9	7	7
5	FRUITS	98.9	110.3	109.5		80.8	90.6	90.3	336	345	344
	DATES	51.3	50.7	50.7	95.0	48.7	48.2	48.2	284	281	281
	LIME,LEMON	3.3	8.5	8.5	97.0	3.2	8.2	8.2	3	8	8
	OTHER CITRUS	6.6	8.2	8.2	80.0	5.3	6.5	6.5	6	7	7
	BANANA	15.1	13.6	12.9	62.0	9.4	8.4	8.0	22	20	19
	COCONUTS	3.3	2.8	2.4	14.0	0.5	0.4	0.3	0	0	0
	GRAPE	2.9	3.0	3.0	75.0	2.2	2.3	2.3	3	3	3
	PAPAYA	0.7	1.0	1.2	75.0	0.6	0.8	0.9	1	1	1
	OTHERS TOTAL	15.6	22.5	22.5	70.0	10.9	15.8	15.8	16	23	23
	MANGO	6.0	6.0	6.0	70.0	4.2	4.2	4.2	—	—	—
	OTHERS	9.6	16.5	16.5	70.0	6.7	11.6	11.6	—	—	—
6	SUGAR	26.7	21.9	21.9	100.0	26.7	21.9	21.9	280	230	230
7	OIL	14.3	17.5	19.4	100.0	14.3	17.5	19.4	363	444	490
8	SAUCE,SPICES	5.1	5.6	5.9		5.1	5.6	5.9	19	18	18
	CHILLI PEPPER	3.1	3.8	4.2	100.0	3.1	3.8	4.2	3	3	4
	SPICE	1.3	0.9	0.8	100.0	1.3	0.9	0.8	11	7	7
	SAUCE	0.7	0.9	0.9	100.0	0.7	0.9	0.9	6	7	7
9	BEVERAGES	6.3	26.9	27.2		6.3	26.9	27.2	0	0	0
	COFFEE	2.7	2.8	3.1	100.0	2.7	2.8	3.1	0	0	0
	TEA,MATE	1.1	0.8	0.7	100.0	1.1	0.8	0.7	0	0	0
	COCOA	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0	0	0
	OTHERS	2.5	23.4	23.4	100.0	2.5	23.4	23.4	0	0	0
10	OTHER FOODS	6.6	4.9	4.9	83.0	5.5	4.1	4.1	23	17	17
11	FISH	57.7	69.4	69.4	51.0	29.4	35.4	35.4	108	129	129
12	ANIMAL PRODUCTS	136.5	147.8	147.9		126.6	136.8	136.8	411	425	420
	MILK	90.1	98.0	98.0	100.0	90.1	98.0	98.0	148	161	161
	BUTTER	3.8	3.0	2.6	100.0	3.8	3.0	2.6	79	62	55
	CHEESE	1.5	1.5	1.5	100.0	1.5	1.5	1.5	17	17	17
	MUTTON	11.6	13.5	13.5	70.0	8.1	9.5	9.5	52	61	61
	BEEF	4.2	4.8	5.3	70.0	2.9	3.4	3.7	20	23	25
	CHICKEN	18.2	19.8	19.8	77.0	14.0	15.2	15.2	67	73	73
	EGG	7.1	7.2	7.2	87.0	6.2	6.2	6.2	27	28	28
	TOTAL								2,828	2,973	3,022

The recent trend of per capita vegetable consumption in Oman represents a rapid increase and indicates that consumption is higher than most OECD countries in those terms, and at the same level as neighboring countries.

In the future, it is estimated that vegetable consumption will increase slightly along with the diversification of the Omani diet.

(3) Fruits

The total consumption each of dates (which accounts for 40 to 50 percent of all fruit consumption), limes, lemons, and mangoes, is higher than in any of Oman's neighbors and has recently maintained a stable level. Banana and coconut consumption in the country are also higher than in neighboring countries, however, it has recently decreased gradually. The consumption of oranges, grapes and other fruits is still lower than most OECD countries but remains stable.

Accordingly, it is estimated that banana and coconut consumption will decrease slightly and other fruit consumption will remain the same.

(4) Livestock Products

(a) Dairy Products

(i) *Liquid dairy products*

In connection with the trend of the demand for dairy products in Oman, a considerable portion is home consumption. *Some aspects of the actual demand, therefore, cannot always be* clearly identified. Table 2.1.8 shows the demand for liquid dairy products such as fresh milk, yogurt and powdered skim milk from 1982-88. The information was derived from a specific assumption for domestic milk production and home consumption as well as from the statistical figures of imports and exports. According to this table, although some negligible annual

Table 2.1.8 Milk Consumption Patterns in Oman (1982-1988)

SORCE	1982	1983	1984	1985	1986	1987	1988
Local Traditional (t)	33,000	35,000	35,000	35,000	35,000	35,000	35,000
Local Commercial (t):M1	3,000	3,500	3,500	4,500	5,000	6,638	6,638
Sub Total (t)	36,000	38,500	38,500	39,500	40,000	41,638	41,638
Net Imports (t)							
1) Milk & Cream Fresh, Skimmed : M2	561	1,477	1,364	1,037	615	672	482
2) Milk in Powder : M3	42,650	41,854	52,718	54,470	92,550	81,054	64,193
3) Milk & Cream, : M4 Preserved, Concentrated or Sweetened	27,313	28,404	27,671	30,496	25,017	26,279	30,492
Sub Total (t)	70,524	71,735	81,753	86,002	118,182	108,006	95,166
Total Demand (t) : D	106,524	110,235	120,253	125,502	158,182	149,644	136,804
Population ('000) : P	1,095	1,145	1,198	1,253	1,311	1,371	1,434
Per Capita Consumption							
D / P (kg)	97.3	96.3	100.4	100.2	120.7	109.2	95.4
(M1+M2) / P (kg)	3.3	4.3	4.1	4.4	4.3	5.3	5.0

Source : Feasibility Study For Establishment of Animal Production Projects in THE SULTANATE OF OMAN, Arab Co. for Livestock Development, 1988.

Table 2.1.9 Estimated Different Classes of Consumers

CONSUMER CLASSES	1987 ('000)	1995 ('000)	2000 ('000)	%
EXPATRIATES				
High Income	42.6	57.3	68.1	3.11
Middle Income	83.4	112.1	133.1	6.08
Low Income	202.4	272.2	323.2	14.76
URBAN OMANI				
High Income	35.0	47.0	55.8	2.55
Middle Income	76.4	102.7	122.0	5.57
Low Income	58.3	78.4	93.1	4.25
TRADITIONAL OMANI				
North	729.5	981.1	1,165.3	53.21
South	143.5	193.1	229.3	10.47
TOTAL	1,371.0	1,843.9	2,190.0	100.00

Population estimated by JICA team.
Distribution of each class are refered with Arab Co. report and the ratio are assumed to be fixed during the projected period.

fluctuation is observed, the per capita consumption of liquid dairy products remains stable at 100 kg per annum. Among these products, however, fresh milk, the taste of which is highly favored, shows an increase in the ordinary consumption market.

Figures in the middle row in Table 2.1.8 show the population increase from 1982 to 1988. Figures in the bottom row in Table 2.1.8 show per capita fresh milk consumption which was obtained from the population and the supplied quantity of fresh milk (the total of M1 and M2 in Table 2.1.8) in the ordinary consumption market from 1982 to 1988. This table clearly indicates a gradual increase in per capita fresh milk consumption, and this tendency can be expected to continue, though the per capita demand for all liquid drinking dairy products seems likely to remain stable in the future.

A demand forecast has been made on the basis of the above demand trends and the following assumptions:

a) The present per capita demand for liquid dairy products is set at 100 kg/year and will not change in the future.

b) The local inhabitants (traditional Omani) mainly consume local milk for home consumption, and occasionally consume reconstituted (skim) milk (M3 and M4 in Table 2.1.8).

c) For the purpose of simplification, low income earners are assumed to consume reconstituted milk, the retail price of which is about one-half of fresh milk.

d) For the same reason, the higher-priced fresh milk is assumed to be only consumed by the upper and middle class income earners, and high income earners are assumed to consume two times the amount of fresh milk consumed by the middle class income earners.

e) The increasing rate of fresh milk consumption in future is

estimated at 2.85 percent per annum which is the same figure as in the past.

f) The estimated population share of the low income earners in 1987 (shown in Table 2.1.9) is accounted for in the future as well.

Figure 2.1.1 and Table 2.1.10 indicate the demand forecasts for liquid dairy products in 1995 and 2000, which are estimated on the basis of the above assumptions.

The demand for fresh milk in 2000 is estimated at 16 thousand tons, which corresponds to slightly more than double that in 1987.

(ii) Cheese and Butter

A portion of the milk produced in the rural areas is generally processed into cheese and butter by the family themselves for their own consumption. However, quantified data are not available. Furthermore, the cheese and butter available in the market are solely imported products. Therefore, the demand tendency and forecast for cheese and butter are discussed herein on the basis of the data only for these imported products.

Table 2.1.11 indicates the demand trend for cheese and butter as well as the per capita consumption from 1982 to 1988. According to this table, the per capita consumption of cheese is constant at 1.5 to 2.0 kg and that of butter is gradually reducing by 2.5 percent per annum. The recent per capita daily calorie intake is estimated to exceed 2,800 kcal; therefore, in accordance with a favorable diet, i.e., the reduction of the fat intake, butter consumption will continue to decrease for the time being.

Figure 2.1.2 and Table 2.1.12 show demand forecasts for

Figure 2.1.1 Estimation of Per Capita Consumption of Fresh Milk

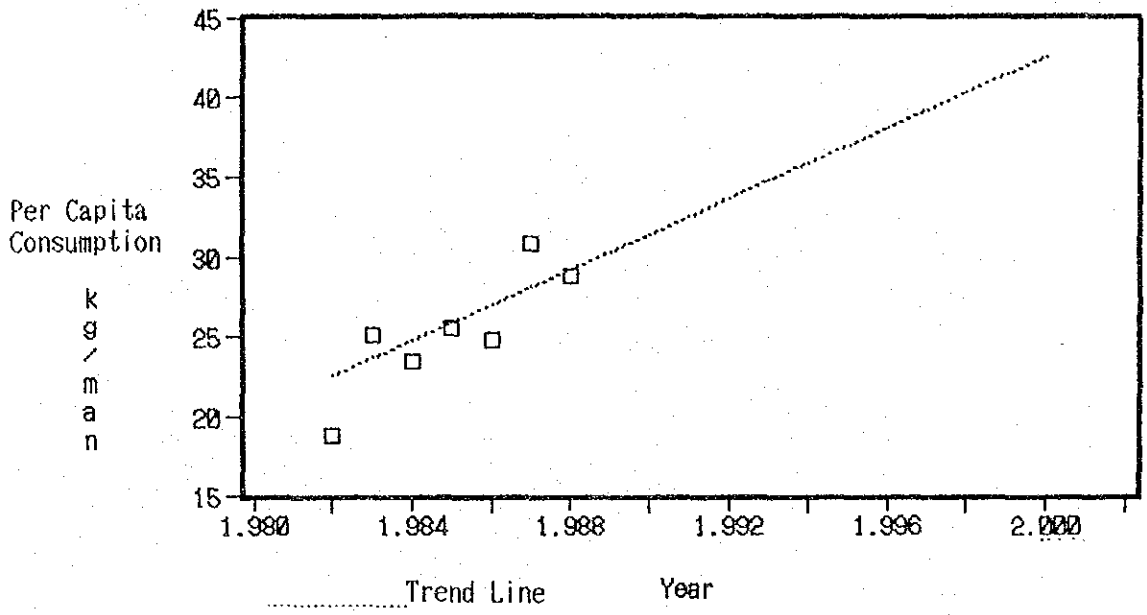


Table 2.1.10 Estimated Demand for Fresh Milk

YEAR	HIGH INCOME GROUP			MIDDLE INCOME GROUP			TOTAL DEMAND (tonnes)
	POPULATION ('000)	CONSUMPTION PER CAPITA (kg/year)	TOTAL CONSUMPTION (tonnes)	POPULATION ('000)	CONSUMPTION PER CAPITA (kg/year)	TOTAL CONSUMPTION (tonnes)	
1987	78	46.4	3,603	160	23.2	3,708	7,310
1995	104	55.8	5,822	215	27.9	5,992	11,813
2000	124	64.2	7,959	255	32.1	8,191	16,151

Table 2.1.11 Butter and Cheese Consumption Patterns (1982-1988)

SORCE	1982	1983	1984	1985	1986	1987	1988
Butter and Cheese (t)	5,941	5,230	4,676	5,487	4,930	5,227	5,481
Cheese and Curd (t)	1,700	2,134	2,295	2,526	2,652	1,849	2,152
Population (,000)	1,095	1,145	1,198	1,253	1,311	1,371	1,434
Per Capita Consumption							
Butter(kg)	5.43	4.57	3.90	4.38	3.76	3.81	3.82
Cheese(kg)	1.55	1.86	1.92	2.02	2.02	1.35	1.50

Source: Sultanate of Oman, Royal Oman Police - Foreign Trade Statistics

cheese and butter under the following conditions:

a) future per capita cheese consumption is estimated at a constant 1.76 kg.

b) per capita butter consumption reduces by 2.5% per annum until 1995, and maintain a constant figure of 3.22 kg after that.

(b) Red Meat (Mutton and Beef)

In connection with the demand tendency for red meat, a considerable portion of total consumption is home consumption. Therefore, as with dairy products, some aspects of the actual demand are not always clearly identified. For this reason, the demand trends for mutton (both goat and sheep meat), and beef during the period between 1982 - 88, which are shown in Table 2.1.13, have been derived from import and export statistics and the constant figures for domestic production amount calculated on the basis of the report on Arab Companies for Livestock Development.

According to this table, with respect to mutton, although the imports of live animals show an increase, per capita consumption has indicated decreases since 1986 (when peak consumption was recorded) due to reductions in imported cold and frozen meat. Regarding beef, imports increased and the per capita consumption also shows a steadily increasing tendency.

The demand forecast has been made on the basis of the above trends and the following assumptions:

(i) Per capita mutton consumption shows a tendency to decrease as described above, however, with respect to mutton, which appeals to the Omanis, it should not be simply assumed that this tendency will continue in the future because domestic production (local production in Table 2.1.13) is an assumed figure, not definite. Therefore, a constant value of 13.7 kg, which is the

Figure 2.1.2 Transition and Estimation of Per Capita Consumption of Butter and Chese

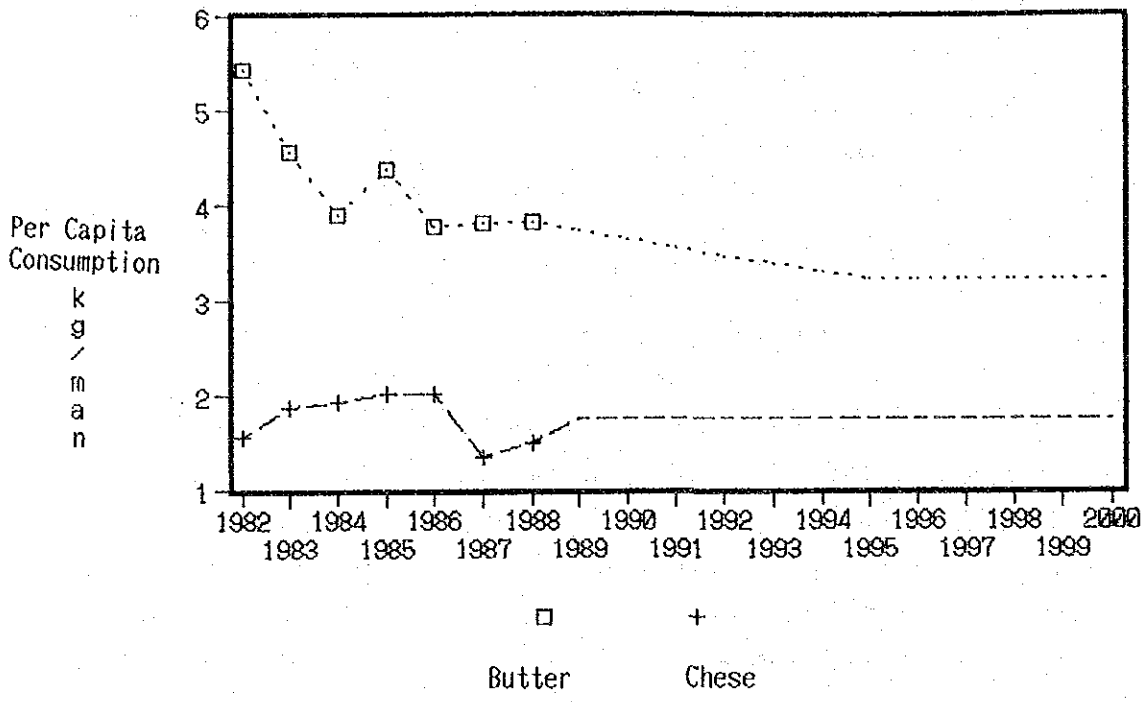


Table 2.1.12

ESTIMATED DEMAND FOR BUTTER AND CHEESE

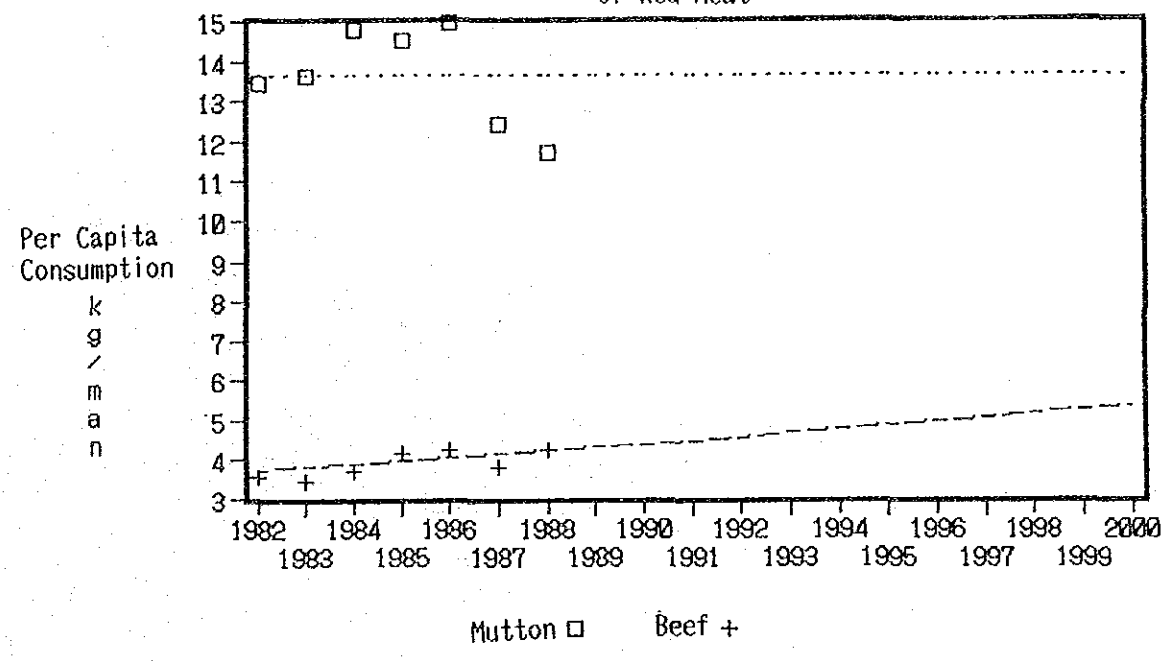
Year	Population	Butter		Cheese	
	(,000)	Consumption Per Capita (kg/man)	Total Demand (tonnes)	Consumption Per Capita (kg/man)	Total Demand (tonnes)
1987	1,371	3.81	5,227	1.35	1,849
1995	1,844	3.22	5,929	1.76	3,246
2000	2,190	3.22	7,042	1.76	3,856

Table 2.1.13 CONSUMPTION OF MUTTON AND BEEF

ITEM / YEAR	1982	1983	1984	1985	1986	1987	1988
MUTTON							
Local Production	3,188	3,283	3,382	3,483	3,588	3,695	3,806
Net Imported Live	1,674	2,762	1,771	2,157	1,864	2,746	3,537
Net Imported Meat	9,881	9,559	12,576	12,539	14,146	10,574	9,485
Total (Tonnes)	14,742	15,604	17,728	18,179	19,598	17,015	16,828
BEEF							
Local Production	2,448	2,497	2,547	2,598	2,650	2,703	2,757
Net Imported Live	63	127	-5	-7	-60	-26	-34
Net Imported Meat	1,384	1,301	1,896	2,593	2,947	2,507	3,335
Total (Tonnes)	3,894	3,924	4,438	5,184	5,537	5,183	6,057
Population ('000)	1,095	1,145	1,198	1,253	1,311	1,371	1,434
Per Capita Consumption							
Mutton	13.5	13.6	14.8	14.5	15.0	12.4	11.7
Beef	3.6	3.4	3.7	4.1	4.2	3.8	4.2
Total(Kg)	17.0	17.1	18.5	18.6	19.2	16.2	16.0

Sorce : Feasibility Study for Establishment of Animal Production in the SULTANATE OF OMAN, Arab Company for Livestock Development, 1988.
Royal Oman Police, Foreign Trade Statistics, 1988.

Figure 2.1.3 Transition and Estimation of Per Capita Consumption of Red Meat



average of the past 7 years has been adopted for per capita mutton consumption up until 2000.

(ii) With respect to the consumption of beef, it can be predicted that the recent trends to increase will continue for the time being. This increasing rate, however, is forecast to be slightly lower than the past ratio, just 2.6% per annum due to the following reasons:

a) the per capita daily calorie intake exceeds 2,800 kcal which is already considerably sufficient, however,

b) the per capita livestock products consumption will not decrease except for butter, as described above.

Consequently, the future increasing rate of beef consumption is estimated to be 2% per annum.

Figure 2.1.3 shows the past per capita mutton and beef consumption. On the basis of this figure, the proposed demands for mutton and beef are estimated for the years 1995 and 2000 and are exhibited in Table 2.1.14 and Figure 2.1.4.

As a result, the estimated demands are about 30 thousand and 12 thousand tons for mutton and beef, respectively, and the total demand for red meat in 2000 is estimated to be as high as 1.8 times the demand in 1988.

(c) Chicken and eggs

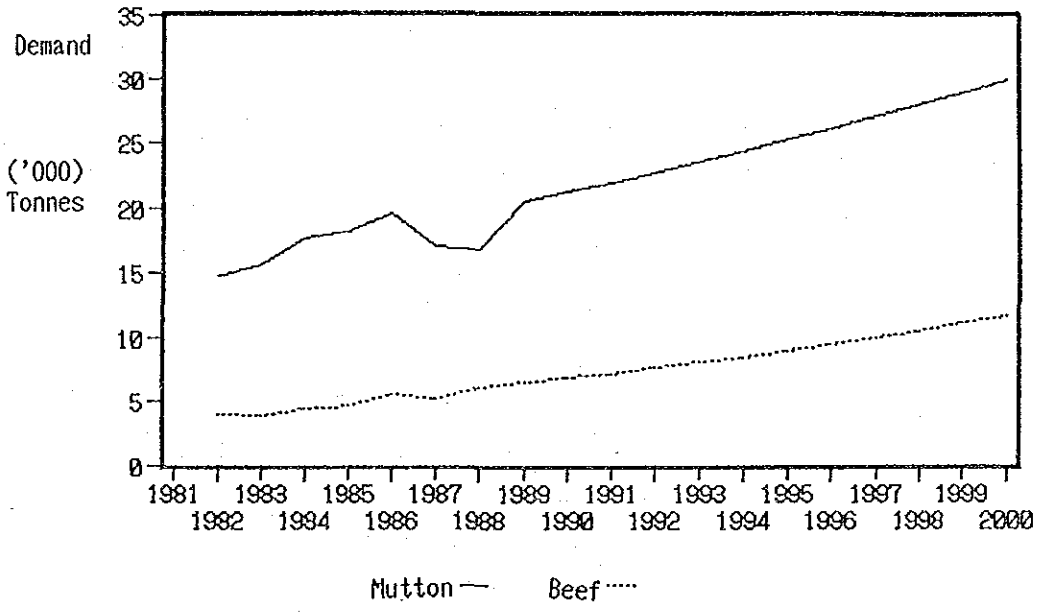
The gross and per capita consumption of chicken and eggs from 1981 and 1988 have been estimated on the basis of import and export statistics and the specific assumption for the domestic production derived from the report prepared by G.R.M. International Pty., Ltd.

Table 2.1.15 clearly reveals that per capita consumption has been static at approximately 150 chickens and 20 kg of eggs per annum

Table 2.1.14 Per Capita Consumption and Total Demand for Mutton and Beef (1988-2000)

Year	Per Capita Consumption (Kg)			Population	Total Demand (ton)		
	Mutton	Beef	Total	(Thousands)	Mutton	Beef	Total
1988	11.7	4.2	16.0	1,434	16,828	6,057	22,885
1995	13.7	4.9	18.5	1,844	25,226	8,946	34,172
2000	13.7	5.4	19.0	2,190	29,961	11,731	41,692

Figure 2.1.4 Transition and Estimation of Gross Demand for Red Meat



since the middle of the 1980's, although the nation's gross demand indicates an increase in demand for both chicken and eggs. Taking this situation into account, per capita demand for both chicken and eggs was estimated assuming that the average per capita consumption during last 5 years from 1984 to 1988 is applicable to the year 2000.

Thus, the predicted demands for chicken and eggs are shown in Tables 2.1.16 and 2.1.17, respectively for the years after 1989. In accordance with an increase in the population, an increase of more than 50 percent in the demand for both chicken and eggs is predicted for the year 2000, compared with that in 1988.

Figure 2.1.5 depicts the estimated and predicted demand for all meat, including red meat, for the period between 1982 and 2000.

(5) Others

Sugar consumption for the last 7 years has been almost constant. Recently, oil and fat consumption have increased considerably. Accordingly, in the future, sugar consumption is expected to remain stable, while oil and fat consumption is expected to increase slightly considering future diet trends, and the fact that present per capita calorie supply has already reached a higher level.

2.1.3 Trends and Prospects for Nutrition Supply Levels

The per capita calorie supply is estimated to exceed 2,800 kcal, as indicated in Table 2.1.4. Per capita protein supply has probably reached 80 grams per day, which is regarded as barely sufficient. The calorie supply consists of cereals such as rice and wheat which provide 40 to 50 percent of the total, other food such as meat, vegetables, fruits and seafood make up the rest. Therefore, on average, Omanis have a nutritionally well-balanced combination of food.

The estimated PFC balance in the calorie supply, the proportions of protein, fat and carbohydrate, represents the appropriate proportion for

Table 2.1.15

CONSUMPTION OF TABLE EGG AND POULTRY MEAT

ITEM / YEAR	1982	1983	1984	1985	1986	1987	1988
TABLE EGG							
Local Production	7,000	39,963	30,017	19,599	18,937	19,000	39,000
Imported	88,000	105,037	134,483	165,501	192,063	171,931	168,473
Total (,000 Nos)	95,000	145,000	164,500	185,100	211,000	190,931	207,473
POULTRY MEAT							
Local Production	2,613	1,179	1,048	1,401	1,970	1,580	1,580
Imported	13,987	18,821	24,952	25,099	25,430	22,915	24,863
Total (tonnes)	16,600	20,000	26,000	26,500	27,400	24,495	26,443
Population (,000)	1,095	1,145	1,198	1,253	1,311	1,371	1,434
Consumption Per Capita							
TABLE EGG (Nos)	87	127	137	148	161	139	145
POULTRY MEAT (kg)	15.2	17.5	21.7	21.1	20.9	17.9	18.4

Source : Feasibility Study for Establishment of Poultry Projects in THE SULTANATE OF OMAN, G. R. M. International Pty. Ltd., 1988. Sultanate of Oman, Royal Oman Police, Foreign Trade Statistics.

1984 - 1988 Average Consumption of Table Eggs 146 Nos/year

1984 - 1988 Average Consumption of Poultry Meat 20 kg/year

Table 2.1.16

ESTIMATED DEMAND FOR POULTRY MEAT IN OMAN : 1988 - 2000

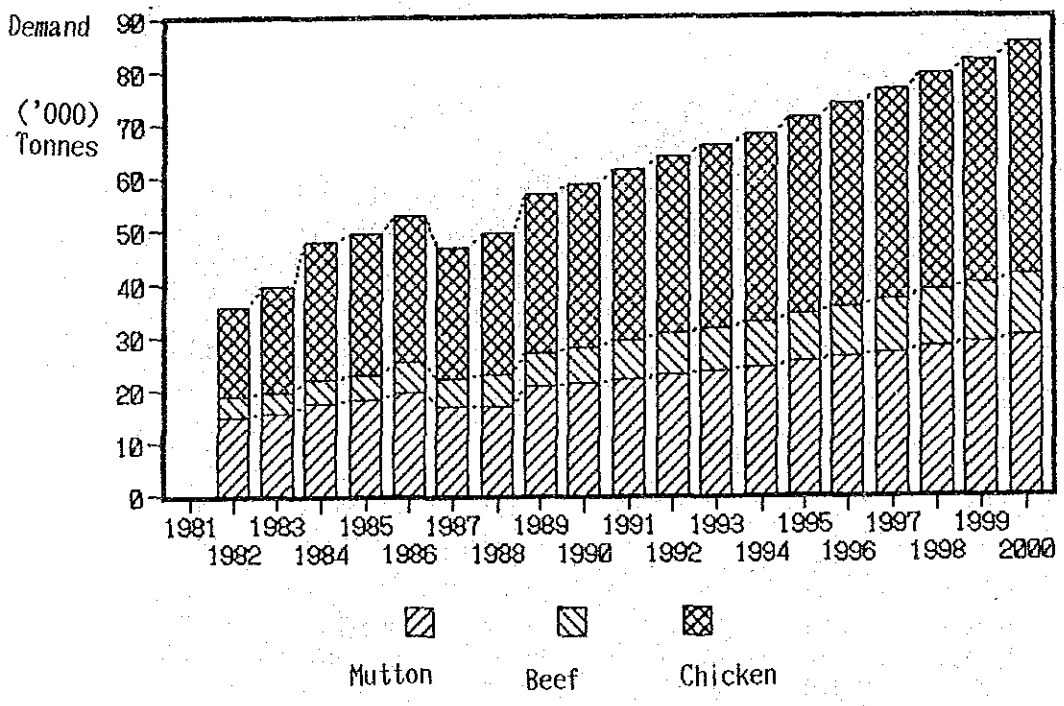
YEAR	PROJECTED POPULATION ('000)	TOTAL MEAT CONSUMPTION ('000kg)	PERCENTAGE CONTRIBUTED BY POULTRY	POULTRY CONSUMPTION ('000kg)	PER CAPITA CONSUMPTION OF POULTRY MEAT (kg)
1989	1,500	56,995	53	30,019	20.0
1990	1,553	59,123	53	31,070	20.0
1991	1,607	61,333	52	32,157	20.0
1992	1,663	63,628	52	33,283	20.0
1993	1,721	66,011	52	34,448	20.0
1994	1,782	68,487	52	35,654	20.0
1995	1,844	71,058	52	36,901	20.0
1996	1,908	73,730	52	38,193	20.0
1997	1,975	76,504	52	39,530	20.0
1998	2,044	79,387	52	40,913	20.0
1999	2,116	82,383	51	42,345	20.0
2000	2,190	85,495	51	43,827	20.0

Table 2.1.17

ESTIMATED DEMAND FOR TABLE EGGS
IN OMAN : 1989 - 2000

YEAR	PROJECTED POPULATION ('000)	PER CAPITA CONSUMPTION (Nos)	TOTAL DEMAND (millions)
1989	1,500	146.0	219
1990	1,553	146.0	227
1991	1,607	146.0	235
1992	1,663	146.0	243
1993	1,721	146.0	251
1994	1,782	146.0	260
1995	1,844	146.0	269
1996	1,908	146.0	279
1997	1,975	146.0	288
1998	2,044	146.0	298
1999	2,116	146.0	309
2000	2,190	146.0	320

Figure 2.1.5 Transition and Estimation of Gross Demand for All Meat



maintaining health as shown in Figure 2.1.6 and Table 2.1.18. Except that the ratio of protein shows a slightly low figure, the Omani diet's proportions are almost within the range of the ideal PFC balance, which is also aimed for in Japan. It differs in this from the fat-biased proportions in western countries and from the carbohydrate-biased proportions in developing countries. Maintaining the present proportion in future is, therefore, essential for maintaining the health of the Omani people.

2.2 Production Prospects for Agricultural Products

(1) Considering the limited water resources, future increases in cultivated areas are expected to be about 5,600 ha by the target year. Thus, the total cropped area should be about 60,000 ha by the year 2000.

(2) Since the absolute quantities of the agricultural production resources such as water and land are limited in the country, productivity should be increased to the extent possible, and the appropriate allocation and effective use of these limited resources promoted in anticipation of the demand for more diversified foods. Based on the promotion of rationalized production, the food supply capacity will be ensured with due consideration to the natural conditions in Oman.

With regard to the self-sufficiency rate, attention must be paid to the predicted 3.5% per annum population increase in the country. This means that a higher growth rate is required for the agricultural production if the self-sufficiency rate is to improve every year.

(3) The prospects for future production of major crops is discussed below.

(a) Cereals

(%)

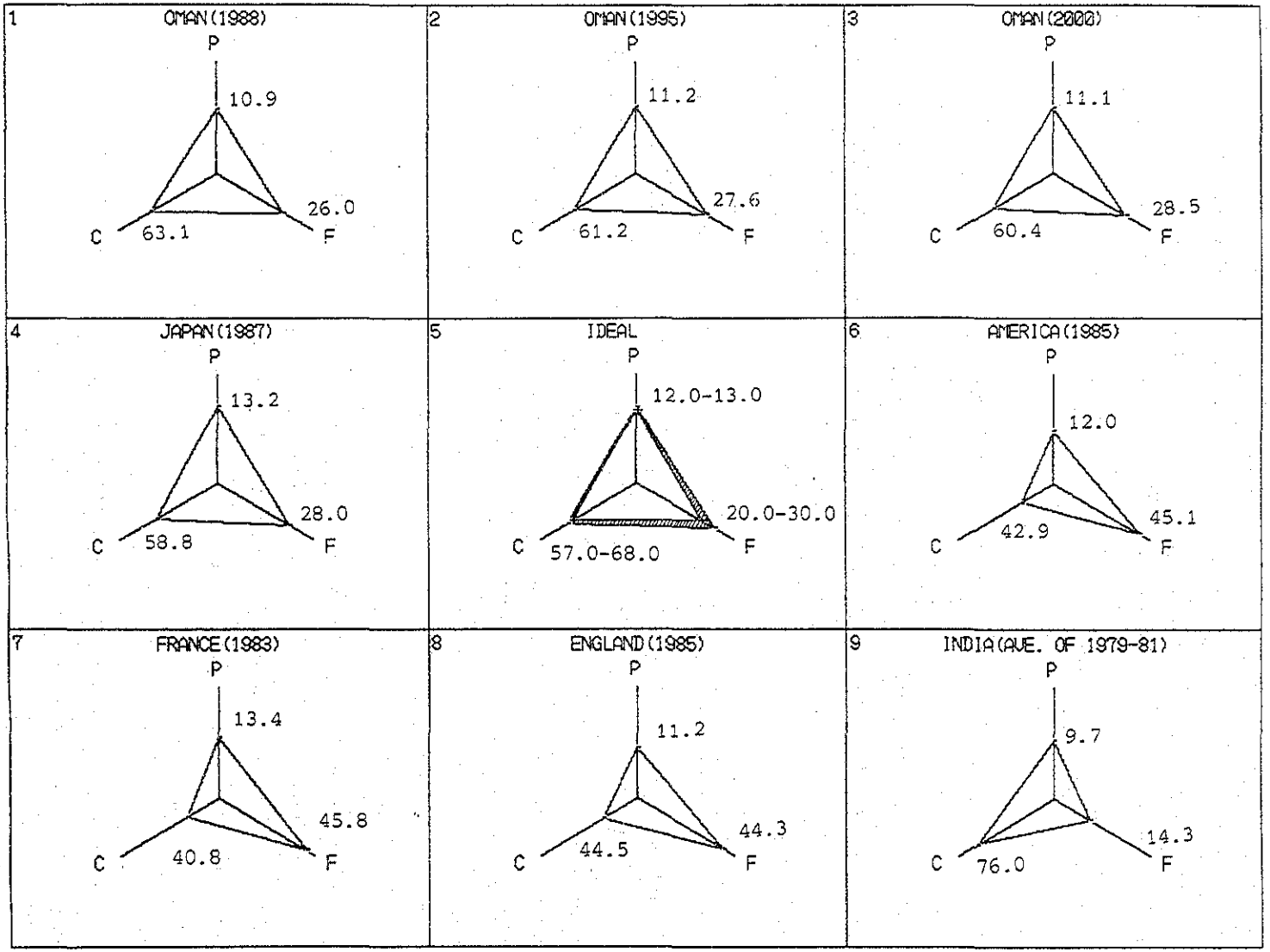


Figure 2.1.6 PFC Balance of Oman and Other Countries

(note) P,F and C represents Protein, Fat and Carbohydrates, respectively

Table 2.1.18 PFC Balance of Oman and Other Countries

(1) OMAN

		1982	1983	1984	1985	1986	1987	1988	1995	2000
PROTEIN SUPPLIES (g/capita/day)		84.7	83.2	82.2	78.5	86.3	72.2	77.0	83.2	83.7
FAT SUPPLIES (g/capita/day)		69.9	76.8	78.3	85.3	78.9	80.8	81.7	91.2	95.6
CALORIE SUPPLIES (kcal/capita/day)	TOTAL	2,992	2,784	2,886	2,686	2,879	2,491	2,828	2,973	3,022
	PROTEIN	339	333	329	314	345	289	308	333	335
	FAT	629	692	705	768	710	727	735	820	861
	CARBOHYDRATE	2,023	1,760	1,852	1,604	1,824	1,475	1,785	1,820	1,826
PFC BALANCE (%)	PROTEIN(P)	11.3	12.0	11.4	11.7	12.0	11.6	10.9	11.2	11.1
	FAT(F)	21.0	24.8	24.4	28.6	24.7	29.2	26.0	27.6	28.5
	CARBOHYDRATE(C)	67.6	63.2	64.2	59.7	63.4	59.2	63.1	61.2	60.4

Source: Estimate by the JICA study team.

(2) Other Countries

		JAPAN (1987)	AMERICA (1985)	FRANCE (1983)	ENGLAND (1985)	INDIA (AVE. OF 1979-81)	(cf.) IDEAL BALANCE (MAX)	(MIN)
PFC BALANCE (%)	PROTEIN(P)	13.2	12.0	13.4	11.2	9.7	13.0	12.0
	FAT(F)	28.0	45.1	45.8	44.3	14.3	30.0	20.0
	CARBOHYDRATE(C)	58.8	42.9	40.8	44.5	76.0	68.0	57.0

Source: 1) OECD "Food Consumption Statistics"
2) Ministry of Agriculture, Forestry and Fisheries of JAPAN "Food Balance sheet, 1987"
3) FAO "Food Balance Sheets, 1979-81"

With respect to rice as a principal food, the future supply is expected to rely entirely on imports, just as it does at present, due to the natural conditions in Oman. Most of the future supply of wheat is also expected to come from imports, due to:

(i) present stable imports at reasonable prices which are expected to continue, and

(ii) limited production base in Oman which does not allow much opportunity to enhance the self-sufficiency rate or increase the contribution to national food security.

However, a slight increase in wheat production is projected because the promotion of production in suitable areas can be expected through extension of recently developed varieties.

(b) Vegetables

A self-sufficiency rate of 100% is proposed for all major vegetables. However, since the vegetables are not cultivated during part of the summer due to natural conditions, 95% is a more realistic target for the average self-sufficiency rate.

Production of major vegetables is predicted below:

(i) Tomatoes, cucumbers, chili peppers, etc.

Due to the above reasons, a 95% self-sufficiency rate is projected. A portion of the produce should be exported during the season, if possible.

(ii) Melons and watermelons

A self-sufficiency rate of 92% is expected. This nearly corresponds the present rate.

(iii) Garlic

Since garlic is storable, a rate of 100% is projected on the basis of the expansion of cropping in suitable areas such as the Interior Region.

(iv) Cabbage

A rate of 85% is projected. This is nearly equivalent to the present rate.

(v) Tuber crops, potatoes, etc.

A rate of 100% is projected based on future expansion in suitable areas, and is possible because these crops can be stored.

(vi) Onions

Due to relatively low profitability, a rate of 50% is projected. This is approximately the same as the present ratio.

(c) Major Fruits

(i) Dates

Considering the vital role of dates in Oman, although profitability is low, the cropping area of 24,000 ha in the base year (1988) should be maintained in the future. Excess should be used for export and feed for domestic livestock.

(ii) Limes and lemons

Because Oman is already self-sufficient, the same amounts shall be allocated for export as in 1982-87. The remaining areas should gradually be converted to orange crops, for which domestic production cannot meet demand.

(iii) Other citrus fruits and grapes

A ratio of 95% is projected through production increases due to large demand and suitability to natural conditions.

(iv) Bananas

Upon achieving 100% self-sufficiency, a further production increase is projected for export, as this produce is imported by neighboring countries due to its superior quality.

(v) Coconuts

The cropping area is expected to increase by 300 ha on a newly developed plantation for processing the additional coconuts. The product will probably exceed the quantity required to provide self-sufficiency and is expected to be used for export.

(vi) Papayas

Nearly 100% self-sufficiency has already been achieved for papaya. This ratio will be maintained in the future.

(vii) Mangoes

A ratio of 75% is projected, which roughly corresponds to the present ratio.

(4) Livestock

(a) Proposed feed supply for the target year

In line with the development target and the implementation of each project proposed in this Master Plan, feed supply (all locally produced except the concentrated feed) for the target year (2000) is estimated on the basis of the following:

(i) The carrying capacity of the rangeland, except in southern Jabal, is 175,000 head of goats per annum, which corresponds to an annual nutrition requirement of 104,227 tons of dry matter. The Range and Livestock Survey, conducted in 1982 by Australian Consultants (GRM), reported 159,000 head of goats as suitable for the carrying capacity of the rangeland. However, a 10% increase is recommended because of the future plans for development and cultivation of fodder trees, etc. in the vicinity of the rural villages.

(ii) The rangeland in southern Jabal is classified below by its carrying capacity and geology, unit dry-matter production, and utilizable rate of grazing in areas. They are estimated and shown in Table 2.2.1.

The dry-matter production per ha for the plateau region in this table is estimated on the basis of data presented in the report on Rangeland Revegetation Project in the Southern Region conducted in 1987 by GRM. Under this project, the average production of dry matter from 19 sites where grazing was restricted by fences was approximately 4 ton/ha. However, in 1987 when the above figure was obtained, the level of rainfall was low in the Southern Region. Moreover, there was considerable deterioration of pasture lands due to over-grazing. Therefore, grass production can be expected to increase provided that an appropriate number of livestock graze under normal rainfall conditions. However, grass yield reduction has to be expected in actual grazing condition. Taking this into account, as well as a 20% decrease in actual grazing, dry matter production has been set at 3.2 tons ha (4 tons/ha x 80%).

Dry-matter production in the escarpment area is estimated at 1/4 of that in the plateau region; and in the coastal region, it is estimated at 1/4 of that in the escarpment area. The following grazing rates: 0.6, 0.7 and 0.8, have been adopted in the regions of the plateau, the escarpment, and the coast,

Table 2.2.1 Estimation of Livestock Carrying Capacity of Jabal Region

Region	Area	DMProduction	Use Rate	DM Amount
Plateau	70,200 ha	3.2 t/ha	0.6	134,784 t
Escarpment	30,400	0.8	0.7	73,024
Coast	3,300	0.2	0.8	528
Total	203,900			208,336

Table 2.2.2 Irrigated Fodder Land (ha)

Item	Existing	Goal	Increase	Remark
(South)				
Alfalfa	320	160	-160	
Rhodes	402	1,260	+858	Convert
Others	48	-	-48	to Rhodes
(North)				
Alfalfa	8,450	4,225	-4,225	
Rhodes	370	8,767	+8,397	
Others	584	-	-584	
Total	10,174*	14,412	4,238	

Source: * MAF Statistical Department and JICA Estimate

respectively, where mainly cattle, goats and camels graze, respectively. The grass production in the rangeland of Jabal Area is estimated 208,336 tons of dry matter as shown in Table 2.2.1.

(iii) In addition to the present areas for feed crops, expansion of irrigated areas for feed crops (4,238 ha) has been recommended based on the joint study between the water resource and agriculture sectors. Furthermore, one half of the area presently cropped with alfalfa (8,770 ha in total) is projected to be replaced with Rhodes grass which was recommended by the government. Moreover, the area (632 ha) cultivated for feed crops other than alfalfa and Rhodes grass, is also projected to be replaced with Rhodes grass.

The unit yield and the use rate for feed crops are as follows:

- Alfalfa ..... 72 tons/ha.year (DM 24%); use rate: 80%
- Rhodes grass ... 120 tons/ha.year (DM 24%); use rate: 80%

The present and future (year 2000) irrigated areas for feed crops are tabulated in Table 2.2.2.

(iv) Among agricultural by-products dates, banana stems and dry fish were studied in the Feasibility Study for Animal Feed Mills in the Sultanate of Oman, conducted in 1988 by the Arab Company for the Livestock Department. This study indicates that the potential dry matter in 2,000 is 16,640 tons for dates and its by-products, 2,933 tons for banana stems, and 18,593 for dry fish and its by-products. The figures for dates and banana stems are used in this Master Plan study. Regarding dry fish, after 20% reduction for loss, only 80% of what remains (of the above figure) is applied for dry fish and its by-products in order to avoid possible clostridium botulism, which is often contracted through less fresh products. On the other hand, dry matter has been estimated at 3,815 tons/ha for residue obtained

Table 2.2.3 Available DM from Crop Wastage

CROPS	AREA ha	PRODUCTION 1000t	YIELD Kg/ha	WASTAGE AT FARM LEVEL %	AMOUNT TON Kg	DRY MATTER RATE %	USE RATE %	POSSIBLE USE t
(VEGETABLE)								
TOMATO	1,212	26.9	22.2	46	12,374			
CHILI PE	610	5.5	9.0	20	1,100			
ONION	560	7.7	13.8	2	154			
GARLIC	150	1.2	8.0	10	120			
OKURA	53	0.7	13.2	30	210			
WATERMELON	1,250	23.8	19.0	15	3,570			
S.MELON	625	8.2	13.1	15	1,230			
CABBAGE	770	17.9	23.2	20	3,580			
CUCUMBER	670	10.0	14.9	25	2,500			
POTATO	140	3.5	25.0	10	350			
(FIELD CROP)					0			
WHEAT	468	0.7	1.5	20	140			
TOBACCO	409	2.0	4.9	20	400			
OTHERS	6,651	56.4	8.5	20	11,280			
					0			
MANGO	3,780	7.6	2.0	15	1,140			
					0			
					0			
					0			
TOTAL					38,148	20	50	3,815

Source: Area and Yield------MAF
Wastage Rate--------Study for Preservation of Fruits and Vegetables by Pickling(1989)

Table 2.2.4 ESTIMATED D. M. REQUIREMENT BY KIND AND AGE

Kind \ Age	Mature				Immature (m-male · f-female)		Young (m-male · f-female)	
	Male		Female					
	kg/day	t/year	kg/day	t/year	kg/day	t/year	kg/day	t/year
1.Cattle								
a.Exotic	13.10	4.782	16.25	5.932	7.65 (f)	2.792 (f)	7.17 (m)	2.616 (m)
b.Cross-bred	-	-	6.90	2.519	5.47 (f)	1.998 (f)	0.88(m·f)	0.323(m·f)
c.Local(North)	3.40	1.241	4.60	1.679	3.65 (f)	1.332 (f)	0.59(m·f)	0.215(m·f)
d.Local(South)	4.76	1.737	5.29	1.931	5.11 (f)	1.865 (f)	0.82(m·f)	0.301(m·f)
e.Fattening	-	-	-	-	4.00 (f)	1.460 (f)	3.60 (m)	1.314 (m)
2.Goat								
a.Cross-bred	1.19	0.434	1.58	0.577	1.27(m·f)	0.464(m·f)	0.20(m·f)	0.073(m·f)
b.Local(in-shed)	1.08	0.394	1.44	0.526	1.15(m·f)	0.420(m·f)	0.19(m·f)	0.068(m·f)
c.Local(grazing)	1.62	0.591	2.16	0.789	1.73(m·f)	0.630(m·f)	0.28(m·f)	0.102(m·f)
3.Sheep								
a.Cross-bred	1.39	0.507	1.85	0.675	1.48(m·f)	0.540(m·f)	0.24(m·f)	0.088(m·f)
b.Fattening	-	-	-	-	1.22(m·f)	0.445(m·f)	-	-
4.Camel	5.25	1.916	7.01	2.560	5.55(m·f)	2.026(m·f)	0.90(m·f)	0.330(m·f)

D.M. Requirements of Mature females include for suckling calves.
Source : Feasibility Study For Establishment of Animal Projects in THE SULTANATE OF OMAN , Arab Co. for Livestock Development, 1988. and JICA estimate refered with the experimental reports from Rumais Research Center and others.

from agricultural products during harvesting.(See Table 2.2.3)

(v) With respect to efficient use of date palm farms, 1/3 of the area is to be used for inter-cropping with feed crops such as sorghum, cowpeas, barley and greenpanic, with a dry matter yield estimated at 8 tons/ha. Consequently, usable dry matter is estimated at 47,040 tons in total (24,170 ha x 1/3 x 8 tons/ha x 0.8).

There are also other future potential feed resources such as by-products from the petro-chemical industry and food processing industry, as well as poultry droppings. They are, however, difficult to estimate at the present time, and therefore, are not considered in this Master Plan study.

The estimated feed supply in 2000, and 689,505 tons of dry matter are shown in volume 2, section 5.7.

(b) Enhancement target of livestock productivity in the target year

Through breeding and improvement of livestock, and improvement of hygiene, epidemic control and feeding management, etc., livestock productivity is expected to improve in the target year to the extent indicated in volume 2, section 5.7.

(c) Potential number of livestock in the target year

In line with the above estimates and assumptions, the potential number of livestock to be fed in the target year is estimated below.

The potential number of livestock in the target year has been estimated on the basis of the required feed assumed in Table 2.2.4, and the potential amount of feed supply in the target year, estimated in Item (a) above. This estimate, however, is based on the following premises, in accordance with the previous item "(1) Livestock Development Concept" in volume 3, section 4.3.

(Southern Oman)

(i) The number of dairy cattle on the commercial farm in the target year is estimated at 2,940 head (of these, matured females account for 1,200 head), which is almost equivalent to the present number.

(ii) The number of sheep in the target year is estimated at 4,000 head, which is almost equivalent to the present number. All of these are expected to be bred under the intensive management program on the irrigated farms in the Salalah Plain and Nejd.

(iii) The number of cross-bred dairy cattle necessary to accomplish the self-sufficient supply of fresh milk, is estimated at 2,000 head, which corresponds to the present number of local cattle in the Salalah Plain.

(iv) The number of goats, which are mainly bred in the Jabal Area, is estimated at 75,000 head, which is about 60 percent of the present number in the Southern Region. However, about 20% of this number is expected to be fed by the intensive management method using the irrigated feed resources in the Salalah Plain and Nejd.

(v) The number of head of cattle and camels will be reduced in proportion to the present grazing capacity of the rangeland in the Jabal Area. However, cattle, particularly the calves, will be fattened under the intensive management method in the Nejd Area.

(vi) The proportion of nutrient supply of fodder to other feeds such as mixed feed ingredients is assumed as follows:

- 85:15 for cattle, camels and goats grazing in the Jabal Area,
- 70:30 for goats and sheep bred under the intensive management program,
- 60:40 for cross-bred dairy cattle,

- 40:60 for dairy cattle on the commercial farm, and
- 25:75 for fattening cattle and goats.

(Northern Oman)

(i) The number of dairy cattle on commercial farms in the target year, is estimated at 1,225, including 500 mature females. This is nearly equivalent to the present number.

(ii) The required number of cross-bred dairy cattle is determined so as to supplement the shortage of fresh milk supply on the commercial dairy farms and in the Salalah Plain, and also to meet the fresh milk demand of the country. These cattle shall be fed mainly by the irrigated fodder in the Batinah Region. The total number of cross-bred, commercial dairy, and local cattle is to be 55,000 in the target year, which is approximately equivalent to the present number of local cattle.

(iii) The target number for camels is 15,000, which is slightly lower than the present number.

(iv) The feed resources in northern Oman which are not used for the above livestock, are to be used for the increased number of goats and sheep.

With respect to goats -- the largest group of livestock in the country --it is not realistic to assume that all traditional feeding methods employed in the domestic and nomadic holding types can be entirely transformed to the intensive breeding method by the target year. It is, therefore, assumed that:

- The proportion of goats fed by the traditional method is estimated to be one-third of the total number,
- The remaining goats will be bred by the intensive method, and
- One half of the goats fed under the intensive management,

excluding those for replacement, are to be fattened to 50 kg while they are young and then sold out.

Since higher quality mutton production will be required, all sheep are to be fed under the intensive management program and fattened to 50 kg while they are lambs, except those for replacement.

(v) The proportion of nutrient supply of fodder to other feeds such as mixed feed ingredients is as follows:

- 80:20* for goats and camels bred by the traditional method,
- 70:30 for goats, sheep and local cattle under the intensive management method,
- 60:40 for cross-bred dairy cattle,
- 40:60 for dairy cattle on the commercial farm, and
- 25:75 for fattening goats and sheep.

* The roughage to ingredient ratio in northern Oman shall be slightly lower than in southern Oman, where other feeds such as dates and agricultural by-products are more available.

On the other hand, poultry in both southern Oman and northern Oman is to be bred so as to satisfy the demand for chicken and eggs in the country.

The estimated potential number of each livestock in the target year is presented in Table 2.2.5.

(d) Supply of livestock products in the target year

Livestock production and its self-sufficiency rate in the target

Table 2.2.5 The Number of Each Livestock in 2000

Total Livestock Heads and
Nutrient Requirement of Each Livestock

Livestock	Female (Heads)	DM (Ton)	Male (Heads)	(Ton)	Young (Heads)	(Ton)	Immature (Heads)	(Ton)	Total (Heads)	(Ton)	Remark
(Southern Region)											
Cattle					(Male)		(Female)				(Others)
Exotic	1,208	7,118	5	23	463	1,212	1,018	2,841	2,940	11,194	Suckling Calves254
Cross-bred	1,266	3,190	0	0	165	53	570	1,139	2,000	4,382	
Local	52,920	88,663	2,118	2,628	11,118	2,390	23,824	31,733	90,000	175,845	
Fattening(Local)					14,023	18,425	3,887	4,508	17,110	22,934	
Fattening(Imported)											
Goats											
NEW	7,937	4,579	794	344	5,238	382	1,032	479	15,000	5,785	
Local	36,810	19,362	3,681	1,450	14,724	1,081	4,785	2,010	60,000	35,735	
Fattening(Cross-bred)											
Sheep											
Cross-bred	2,051	1,385	205	104	1,497	132	246	133	4,000	1,753	
Fattening(Cross-bred)									728	324	
Fattening(Imported)											
Camels	15,341	39,273	614	1,176	8,744	2,888	2,301	4,662	27,000	47,996	
Poultry											
Broiler									7,162,500	22,341	(
Layer									274,667	18,534	(
South Total										385,849	
(Northern Region)											
Cattle											
Exotic	500	2,965	2	10	193	505	424	1,184	1,225	4,664	Suckling Calves106
Cross-bred	3,481	8,772	0	0	453	145	1,566	3,133	5,500	12,050	
Local	24,369	40,916	975	1,210	5,122	1,101	10,970	14,613	41,436	57,840	
Fattening(Local)									8,964	10,836	
Fattening(Imported)											
Goats											
NEW	381,587	174,816	38,159	13,089	190,848	14,530	39,206	18,192	570,800	219,827	
Local	174,847	91,969	17,485	6,889	69,939	4,756	22,730	9,547	285,000	141,451	
Fattening(Cross-bred)									53,542	23,826	
Sheep											
Cross-bred	97,436	65,769	9,744	4,940	71,128	8,259	11,692	6,314	190,000	83,282	
Fattening(Cross-bred)									34,596	15,395	
Fattening(Imported)											
Camels	8,523	21,818	341	653	4,858	1,603	1,278	2,590	15,000	26,665	
Poultry											
Broiler									35,812,500	111,704	(
Layer									1,373,333	52,668	(
North Total										595,806	
TOTAL										197,247 901,755	(Poultry Others
										1,099,002	

Table 2.2.6 Production Supply and Self-sufficiency Rate

Item	Fresh Milk	Table Egg	Poultry meat	Red meat	Remark
Demand (in 2000)	16,151ton	320 million	43,827ton	41,692ton	See Table
Supply(2000)	16,151	320	43,827	20,073	
Self-Sufficient Rate(2000)	% 100	% 100	% 100	% 48	
Self-Sufficient Rate(1988)	93	19	6	29	

Table 2.2.7
TARGETS FOR TABLE EGG PRODUCTION

YEAR	1995	2000	REMARK
(Small-holder Farms)-----	Production	30 %	
Total Egg Production (millions)	74	96	(a)
Total Layers Required ('000) @ 150 eggs/layer/year	493	639	(a)/0.15 =(b)
Number of Farms Proposed:			
@ 300 layer capacity units (i.e. 45,000 eggs/year)	1644	2132	(b)/0.3
(Commercial Layer Farms)		70 %	
Total Egg Production (millions)	168	224	
Total Layers Required ('000) @ 220 eggs/layer/year	147	399	
Egg Production Expected in Existing Farm		136	
Target : Percentage of	%	%	
Self Sufficiency	90	100	

Source : Based on Feasibility Study for Establishment of Poultry Projects in SULTANATE OF OMAN - G.R.M. Pty. Ltd., 1988.

Table 2.2.8
TARGETS FOR POULTRY MEAT PRODUCTION

YEAR	1995	2000	REMARK
(Production from Layer Farms) Spent Layer (millions)	0.5	0.9	
(Small-holder Farms)		25 %	
Total Broiler Production (millions kg)	8.2	11.0	(a)
Number of Farms Proposed:			
500 broiler/shed (3,000/year)	2603	3478	(a)/0.00315
(Commercial Broiler Farms)		75 %	
Total Broiler Production Required (millions kg)	7.1	14.7	
Broiler Production Expected in Existing Farm		17.32	
Target : Percentage of	%	%	
Self-Sufficiency	90	100	

Source : Based on Feasibility Study for Establishment of Poultry Projects in SULTANATE OF OMAN - G.R.M. Pty. Ltd., 1988.

Table 2.2.9 TARGETS FOR FRESH MILK PRODUCTION

ITEM / YEAR	1988	1995	2000	
Total Demand (t/year)	7,310	11,813	16,151	
Production from Existing Farm (t/year)	6,013	7,310	7,650	
Deficit (t/year)	1,297	4,503	8,501	
Target for Contribution-Ratio to Deficit (%) (= Self-Sufficiency Rate)	-	50	100	
Production from Projected Farm (t/year)	-	2,252	8,501	
(Traditional Sector)				
Southern Region, 50% (t/year)	-	0	4,250	
Required no. of Cows (@ 0.125t/cow/year)	-	0	52,312	Milk Collecting Rate 65%
Southern Region (t/year)	-	0	1,105	
Required no. of Cows (@ 1.2t/cow/year)	-	0	1,228	Milk Collecting Rate 75%
Northern Region% (t/year)	-	0	3,145	
Required no. of Cows (@ 1.2t/cow/year)	-	0	3,494	Milk Collecting Rate 75%
Total			8,500	

Table 2.2.10

TARGETS FOR RED MEAT PRODUCTION

ITEM / YEAR	1988	1995	2000
Total Demand (t/year)	22,885	34,172	41,692
Producion in Southern Region			
(Beef)			
Exotic Dairy Cows	199	204	204
Local Indigenous Cattle	1,584	3,000	3,643
(Sub Total)	1,783	3,204	3,847
(Goats and Sheep)	508	549	661
Total	2,291	3,753	4,508
Producion in Northern Region			
(Beef)			
Exotic Dairy Cows	78	85	85
Local Indigenous Cattle	889	1,310	1,732
Crossbred	0	72	145
(Sub Total)	967	1,467	1,962
(Goats and Sheep)	3,290	6,842	13,603
Total	4,257	8,309	15,565
Total Beef Production	2,750	4,671	5,809
Total Mutton Production	3,798	7,391	14,264
Total Meat Production	6,548	12,062	20,073
Self-Sufficiency Rate (%)			
(Beef)	45.4	52.8	49.5
(Mutton)	22.6	30.3	47.6
(Total)	28.6	36.3	48.1